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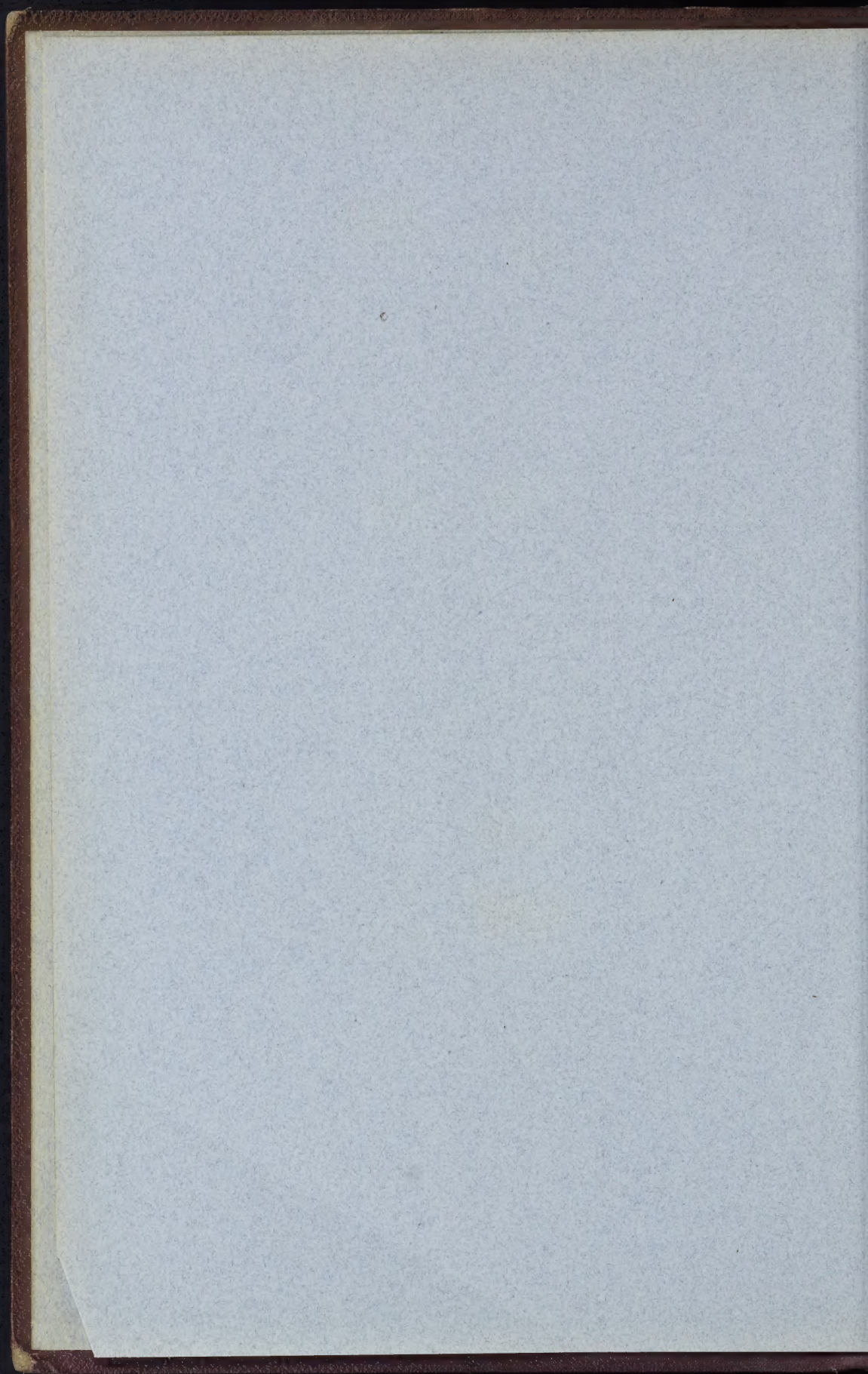




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AN

✦ ILLUSTRATED ✦ WEEKLY ✦ MAGAZINE ✦

FOR THE

ARCHITECT, ENGINEER, ARCHÆOLOGIST, CONSTRUCTOR,  
SANITARY REFORMER, AND ART-LOVER.

CONDUCTED BY

H. H. STATHAM,

FELLOW OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

"Every man's proper mansion-house, and home, being the theater of his hospitality, the seat of self-fruit, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kinde of private principedome, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned."

"Architecture can want no commendation, where there are noble men, or noble mindes."—SIR HENRY WOTTON.

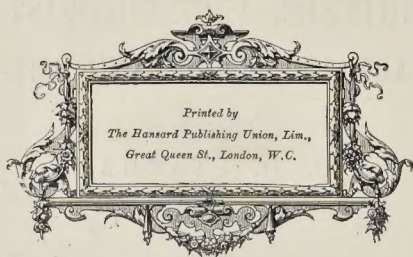
"Our English word TO BUILD is the Anglo-Saxon Bylban, to confirm, to establish, to make firm and sure and fast, to consolidate, to strengthen; and is applicable to all other things as well as to dwelling-places."—DIVERSIONS OF PURLEY.

"Always be ready to speak your mind, and a base man will avoid you."—WILLIAM BLAKE.

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# THE BUILDERS

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### Earthwork Slips and Subsidence upon Public Works.\*

It is not very long since the students in engineering at King's College, on perusing their examination paper, found the following question amongst the ten which they had to answer in three hours:—"Illustrate by sketches how to prevent slips in railway cuttings, and how to provide for the drainage of the line."

A considerable part of the 225 pages which Mr. Newman has devoted to the subject named at the head of this article is expended on solving the question put by the examiner to the students, and if either the examiner on the one hand, or the students on the other, were fully aware of the extent and variety of the preventive measures which have to be considered and brought under review in dealing with slips in cuttings and the drainage of a line of railway, the hairs of both parties might well have been expected to slightly rise; for it is manifest,—or, at all events, it is manifested by Mr. Newman,—that long before the close of the three hours, it would have become apparent to them that full credits to such a question were wholly unattainable.

But even Mr. Newman does not attempt to solve this question by illustrative sketches, nor do we very clearly see how, unless a special case is stated, preventive measures are to be so illustrated, whatever might be the case with remedial measures.

We are not, however, concerned now with the examinations at King's College, but with

Mr. Newman's book on slips in earthworks, and we gladly welcome it as an important contribution to a right comprehension of such matters. There are few things more annoying or more calculated to vex the soul of an engineer, whether he be engaged on railway, water, dock, or other works, than the failures which, with all his care, and often with a most extensive stock of experience and good reputation, will sometimes happen to the works he has executed, or is in the course of executing; but there is much in this book which will at all events guide the mind of the student to the points, and there are many of them, which have to be weighed by designers of engineering works, and which, if attended to, and fixed on the memory, will certainly guard them against probable if not against possible slips in earthworks.

It is very easy to blame the engineer when such things happen, and when anything with which he is connected goes wrong.

A case which is referred to by the author is here given, and, though it seems almost too good to be true, is one which we presume is actually a fact, for it appears between inverted commas as a quotation from a report. It is from the report of a local committee, formed to declare the best means of preventing floods in a district. After deep consideration they reported as follows:—

"That the committee were of opinion the floods would be permanently removed provided the engineer diverts all rivers, streams, watercourses, and ditches to the next valley, and closes the upstream hole in the hill, and causes the water to be discharged into the next valley, or elsewhere, and reduces the rainfall within the limits required by the inhabitants of the district."

It has been surmised that the operations of the Arab and the sword have had a certain effect in reducing the rainfall in some portions of the globe, by reason of the neglect and decrease of vegetation under certain con-

ditions, but it is hard for the engineer to be bracketed with the Arab, and to be called on to interfere with that which is usually considered to be a providential arrangement. Doubtless he could have stopped the "upstream hole in the hill," and caused the water to be discharged into the next valley or elsewhere, and, if necessary, have removed mountains, but the local committee would probably have looked somewhat aghast when the estimates were laid before them.

The points which Mr. Newman more particularly insists on (and so frequently refers to in the course of the work under review, that unless we were assured that this repetition must be for the express object of hammering them into the mind, we should feel inclined to say that it was unnecessary), are, firstly, that water is the cause of nearly all the slips, and, secondly, that the properties belonging respectively to the various kinds of rocks and soils should be fully considered. He enters very minutely, not to say microscopically, into this analysis of soils, taking consecutively the chalks, marls, clays, gravels, and sands, &c.; explains the proportions of water which each kind is capable of absorbing, their relative weights when in a wet or in a dry state, their natural angles of repose when kept dry and when saturated, the frictional powers possessed by the particles of which each kind of soil is composed for resisting its tendency to slip, and so on. There is much to read, and read carefully, on all these points, as well as on the contraction of ground under pressure (such as that of an embankment) when well drained. The author prominently exhibits the (bump of caution when he says that it is impossible (and the use of such a word is generally objectionable) "to determine any rules even for a particular soil." Still, we may expect to receive evidence of their general behaviour under the different conditions to which they are ex-

\* "Earthworks," &c. By John Newman. London: E. & F. N. Spon. 1890.



posed by such causes as those of the atmosphere combined with the hand of man, and it has become a habit with us to say, "as a rule, such and such a thing happens"; and as the author gives lists of the slopes which have "as a rule" been found most appropriate and safest for various soils under various conditions, and gives detailed accounts of a good many effects which are found generally to occur in practice from ascertained causes, it is rather superfluous to say that it is "impossible to determine rules." What is the use of a book of this kind if it is not to furnish us with rules for our guidance, to save our time, and to tell us something of which we were previously ignorant? It is not improbable that many engineers who have been much engaged in field practice have met, at some time or other in the course of their work, with most of the peculiarities mentioned by the author in the behaviour of earth, and have had to exercise what is called their "common sense." It is, perhaps, a proper pride which leads so many of us to treat with indignation the suggestion that we are not highly endowed with that merit (or virtue), but even to those who do possess it, the rapidity with which a right conclusion may arrive to that commonly sensible mind must vary with individuals, and one object in a book of this kind must be to save the time of the more slowly-revolving brains of those who are frequently called "practical" men by supplying them with the boiled-down experiences of others in the shape of rules.

There may be other causes than those mentioned by the author which conduce to slips and subsidences in cuttings, but he presents us with thirty-one heads of the chief causes, the first ten of which he classes as natural, and the remainder as artificial. Similarly, he gives us thirty-eight separate heads of the chief causes of slips and subsidences in embankments, of which seven are classed as natural. The definition of natural is intended to apply to those which are "beyond the power of man to entirely prevent," and that of artificial to those which are "in some degree to be prevented, unless obviously the result of the unavoidable exigencies of construction." We have no desire to be considered hypercritical, but we must bear in mind that the avoidable exigencies of construction are those which can be anticipated by a combination of various qualities, such as knowledge, care, and the aforesaid common sense; and when slips occur in consequence of an insufficiency of those qualities on the part of engineers or others, then such slips and subsidences can scarcely be termed unavoidable. It is with the help of such a book as this that the number of cases ought to be greatly increased in which slips can be avoided by exigencies being anticipated.

10. There is considerable identity in the causes of slips in cuttings and embankments respectively, such as the action of rain, snow, and frost on the several parts of a slope, and more especially on the toes and feet of slopes, the insufficiency or neglect of suitable drainage of the ground immediately at the back of the faces, and of the ground adjacent to slopes, honeycombing by rodents, vibration, excess of slopes, &c. With respect to cuttings, he assigns more particularly (in addition to the above named) the removal of support against the action of sliding (especially on "side-long" ground); the blasting of laminated rock dipping at a considerable angle towards a cutting in the side of a hill; the neglect to fill up, or otherwise remedy, cracks or fissures in the slopes; and, with respect to embankments, unequal loading, want of adhesion between the surface of the ground upon which an embankment is tipped and the deposited material; tipping the central part first, and completing the width and slope by side deposition after some time has elapsed; the backing up of water behind a retaining wall, or the failure to provide for its removal from the bottoms of benches, &c.

He then presents us with sixteen maxims, to be observed, where practicable, in the consideration of the location of earthworks

(hints as to what should be avoided, which are of considerable value); but unfortunately other considerations almost invariably outweigh these points except in a minor degree, though the capital cost of a work and the cost of its maintenance may both be very sensibly reduced by attention to all the points alluded to by the author.

Referring to tunnelling in clay, the author reminds us of "the enormous force clay possesses upon swelling, and its contraction upon drying," causing them to be risky undertakings, and that special care should be taken to allow for this "by reducing the uncovered lengths to the least dimensions, having dry, yet hard and compressible filling between the arch and the walls and the clay, using material with great compressive strength for the lining, leaving plenty of weeper-holes, and draining away all water as it exudes." Suggestions which, of course, sound commonplace to a practised engineer, but are useful to the student.

In the chapter on the treatment of slipped earth he gives, as aids to memory, the following four questions, which have to be determined when a slip has occurred:—

1. Should the whole or part of the earth that has slipped be removed?
2. How are the voids to be filled that have been caused by the slips?
3. Can the disturbed material be again used?
4. What protective measures should be adopted?

We should be disposed to suggest an addition to such questions, as follows:—  
What time is available for the execution of this work?

We do not quite follow the author in his suggestion (p. 75) that it "may be advisable to allow the overflow waters of a river, when the extreme flood level is known, to gently pass over a line of railway, it being kept at such a level as not to impede free working, and to ensure that any back water is not prevented from escaping." Nor can we agree with the conclusion at which he arrives if this be not allowed.

The advice given in the chapter on Methods of Draining is sound and good, though it seems scarcely necessary to bring so repeatedly before the reader, both here and elsewhere, the fact that water percolates with facility through sand, and does not do so through clay. Speaking of culverts, the author says:—

"In some countries having a severe climate, or in high mountainous districts where the soil is rock, and a heavy discharge of flood-water occurs, instead of placing a culvert and gathering the waters at or about the level of the toe of an embankment, in deep hillsides or ravines an unlined tunnel is made under the embankment in the rock, thus avoiding a masonry or brickwork structure, which could only be set in the summer months, and preventing the waters touching the seat of an embankment and promoting a slip."

We do not know of any such cases, and we should take the strongest objection to such an arrangement. If the time of year was unsuitable for making a masonry culvert, it would be equally unsuitable for making a tunnel; the tunnel would have to be a much greater length than the culvert, it would be a great deal more expensive, more easily blocked by rocks and trees, and, if blocked, place the embankment in a position of great risk. A half-sunk culvert, with a basin on the upper side, would, in such a case, be distinctly preferable. It is an entirely different case to that of a discharge-outlet from a reservoir.

In the chapter on the safe maximum load upon different earths and on normal pressures, we find some useful tables of an accuracy generally sufficient, but the author is wisely careful in enumerating half a dozen or more saving clauses which affect the figures given in those tables, the most important of which is perhaps the "comparative dry or wet state of the earth." But he generalises in a manner which is very common and very misleading in his table on the weights of substances, by giving fixed weights to certain classes of rocks and soils, such as granite 2.10 tons to the cubic yard, whilst, as a matter of fact, some granites are at least 12 per cent.

heavier than others. He is also not sufficiently accurate in giving sandstone from 1.70 to 1.95 tons to the yard, the actual range giving a difference of about 70 per cent. between one kind and another. There are also useful tables of reference of the general range of slopes in many kinds of soil, and of the co-efficients of friction, and the author shows with sufficient clearness the inexpediency of cutting diagonal or transverse trenches in the surface of the slope, as tending to disturb and destroy the continuity of supports of the surface, and do more harm than good if by any means such trenches got choked.

We are glad to see that the author enters at some length into the subject of the due provision of drainage at the backs of retaining walls, a matter so often neglected or overlooked, and carries this subject to a far larger one, the causes which tend to disturb the repose of dock walls. His remarks on these matters are well worthy of consideration, and are thoroughly practical, and the items which have to be taken into account in the necessary statical calculations very well introduced.

We were not, however, aware, nor are we prepared to allow the accuracy of his statement, that "there are few extensive docks that have been constructed in any but the firmest earth that have been free from such a mishap," i.e., "masses of the wall sliding forward from want of sufficient depth of foundation or hold on the ground." The construction of walls for wet docks which will stand all right when once the water has been let in is comparatively a simple matter, but the difficulties lie and the failures have occurred before that all-important time has arrived; and unless it is recognised that as dock walls are raised, so should advantage be taken of the thrust of water against them, and of the weight of water over that portion of the bottom of the dock which lies immediately in front of the bottom of the wall, it is not improbable that failures will continue to occur, failures whose importance in cost is in no way measured by the actual cost of the work of repair.

A little hint is given by the author which is very useful to bear in mind, though sometimes from motives of so-called economy disregarded, it is that "anything tending to make a wall of varying strength, unless exceptionally required, should be avoided; such as the junction of lime concrete with Portland cement concrete, or the employment of the hardest and strongest bricks or stones and their connection by means of a weak mortar."

In the chapter on the "Foundations of a Tidal Embankment," the author introduces us to a few calculations (pages 182 to 186); but it is unfortunate that he should in several cases have miscomputed the volumes of some of the masses of embankment, as these form the bases of the calculations, and the results arrived at are, consequently, in one case, at least, entirely erroneous. As no diagrams are given, to which the reader can refer, it is still more puzzling to follow him in these calculations; but the error is sufficiently apparent,—one, perhaps, that a schoolboy might make, but which ordinary care should have prevented from being committed in a work of this nature,—viz., that the area of a right-angled triangle is not the sum, but half the sum of the perpendicular and the base.

In conclusion, we may say that there is plenty of good, useful information to be obtained from this work, which touches a subject possessing an exceedingly scanty vocabulary; but it is a work not without blemish; the style is tedious, and the language often involved; commas and semicolons are frequently stuck in wrong places, necessitating a repurcell of a paragraph, and consequent waste of time before the sense of a sentence can be detected. If the work reaches a second edition, these defects may perhaps be rectified, but even with those defects, it is a book containing an immense deal of matter, which must be swallowed sooner or later by every one who desires to be a good engineer, not excluding the students of King's College.



## SUBCONTRACTING IN THE BUILDING TRADE.

BY EDWD. C. ROBINS, F.S.A.

**A**BSENCE from town prevented my taking part in the discussion of this subject which took place at the Council of the Institute on the 1st ult., but its importance cannot be exaggerated, and it is to be hoped that the relations between the architect, the contractor, and his subordinates will receive that careful consideration which the President promised.

The root of all the evils complained of is the spirit of unrighteous competition with which this age is cursed. The unprincipled class of the general public cares nothing about consequences to others,—it is only concerned about itself; the convenience and profit of competitive exactions is too great to be sacrificed for such commonplace things as principle and justice.

The virtuous public argues in this manner: Charity begins at home. I want a building to suit my needs at the least possible cost; therefore, since it would cost money to go straight to an architect for a design, I will divert for one that will not only cost me nothing, but will set twenty architects to struggle which can outbid the other in anticipating my wishes. Having got twenty designs to select from, I shall make it a condition that my acceptance of one of them shall be dependent on its being built for a sum not exceeding ten per cent. of the architect's estimate, by which means I shall utilise its wits in my interest to the uttermost.

"I shall next get up a competition between the builders by inviting some dozen to give me tenders for the execution of the work. I will then accept the lowest estimate and rely upon my architect to get the best material and workmanship out of the contractor he possibly can, who shall be bound to carry out the works to his satisfaction within the stipulated time, under heavy penalties. It matters little to me who does the work, so that I have a responsible man as contractor, who, if he loses over my contract, may repay himself out of another where the competition has been less keen,—while my architect, for his own credit's sake, will see me safely through, 'doing it all in a legal way.' Public opinion is not sufficiently enlightened to question my action or my motives; moreover, is it not the common custom, and therefore not to be considered reprehensible in any way?"

Under such circumstances, is it any wonder that builders subtlet to secure themselves from loss? The system is one of diamond cut diamond from beginning to end. How is the selfish public to be taught better, where every encouragement is given it to do worse, and not only commit the transgression, but to shut its eyes to the almost inevitable consequences?

As an editor, you say "that we live in an age where there is no time to consider this, and everyone must go the pace or drop out," but you "would welcome an effort to stem the torrent."

That effort has been made at the School Board and at the County Council, and as a consequence underselling builders are not to be invited to tender. General public competition is to be tabooed, and only selected men are to be suffered to compete. This is a step in advance and the very least that should be done. A fair price for good work is desired to be given, as the cheapest in the end, and subtleting may fairly be expected to cease among batches of builders who compete with one another on the previous and precise understanding that sweating prices are to be disallowed.

But why must we continue to insist on the one man system? The masterpieces of the middle ages were not so raised. The "Prentice Pillar" of Roslyn Chapel was not the work of a chance journeyman of a great contractor.

Mr. Macvicar Anderson, like many more of us, finds it needful to make special terms with specialists for special work required to be

specially well done, and such estimates may be included in the general contractor's lump-sum contract when that is a necessity, but it is better that he should be separately contracted with and his credit for his portion of the work equally shared with his colleagues.

Mr. Aitchison thinks it would give more trouble to the architect. I doubt it. The trouble is how to get good work done at all when there is no personal interest in doing it, except as a means of livelihood; whereas, were there to be masters in each trade, and were these masters to be separately responsible, there would then be some one to look to, whose pride in his craft and knowledge of all its details would enable him to rear apprentices and bring his own skilled workman to bear upon his portion of the work to be done.

There might still be one to provide scaffolds and service of all trades and things of common use.

The "universal provider" system now in vogue is destructive of all personal relations between the employer and the employed. A huge company possessed of neither body nor soul, a sort of calculating machine or financial centre, is substituted for the honourable master-craftsman and his army of respectful disciples.

The spirit of the age is in favour of co-operative centralisation, and to such an extent is this carried, that soon no private business will be found competent to compete with the capitalist whose capital is concentrated in the hands of a few, for the so-called benefit of the many, but really for their own aggrandisement. Looming in the distant future is the great confederacy, the monster monopoly of a ring of universal providers and mighty companies; and the extinction of all individuality and independent worth and enterprise, unless cut short by the realisation of Mr. Bellamy's State organisation, foreshadowed in "Looking Backward."

We may, however, as has been shown, do something to avert these evils, if only we can recognise them as evils and work against them. We may help to raise the tone and character of Trade Unions and give the sympathy of the profession with the leaders of the movement, and help to make public opinion fairer, so that good, capable workmen may be delivered from the oppression of the incompetent, and not bound to work down to the level of their fellows' incapacity, and be content with the same terms and pay.

Some mode of improving the condition of the deserving should be developed,—by rewarding the already competent by a system of remuneration in which merit shall meet its due reward in corresponding emolument. These are the men to whom "profit sharing" would not be demoralising, but an encouragement in well doing. We cannot suppose that the great contractor is alone disinterested and honest enough to give the best materials and workmanship; his best men will be ready to follow his lead, and to maintain the reputation of the firm which is their commonwealth, if mutual confidence is established and maintained.

E. C. R.

## SUBMERGED BUOYANT BRIDGES.

**T**HROUGH railway communication between all the large European towns at the present day is only prevented by the great expenditure entailed in bridging over, or tunnelling under, the many large rivers and channels which now interrupt through traffic, and, although in some cases objections might arise from military considerations, yet it is nearly always financial, and not engineering or military, difficulties that have to be surmounted.

The easiest method of overcoming this interruption to through traffic is generally by means of a bridge, for so great is the progress made during recent years in the science of bridge building, owing chiefly to the introduction of mild steel, that in nearly all cases this method is to be preferred.

When, however, the river or channel to be crossed is so deep as to render the formation of piers a very difficult operation, or the

shipping interests demand great headroom and very large spans to be allowed, a tunnel may be more suitable, although the experience gained by most sub-aqueous tunnels teaches the engineer, if possible, to avoid them.

During the last few years several schemes have been proposed as substitutes for the ordinary bridge and tunnel referred to, the chief advantages of which are stated to be, firstly, that they do not, like ordinary bridges, interfere with the navigation of the channel crossed, and secondly, their construction is much more simple than a tunnel, and consequently more economical.

Such schemes as these are generally described as "Submerged buoyant bridges," and consist of a water-tight tubular structure through which the roadway is made. Such tubes would be submerged at any convenient depth, and, having considerable buoyancy, it would be necessary to hold them in position, both vertically and horizontally, by ties and anchors.

Mr. James Maxton, M.I.N.A., in an essay originally read as a paper at the Belfast Natural History and Philosophical Society last April, proposes such a scheme for a bridge between Ireland and Scotland, to be placed between Donaghadee and Portpatrick, a distance of nineteen nautical miles. The maximum depth of water along this route is about 900 ft.

Mr. Maxton, in his paper, does not enter into any great detail of his scheme, the description being intentionally more or less popular, so that it is not possible to criticise his methods of overcoming the difficulties that would arise should such a scheme ever be seriously entertained, but it is our opinion there is no possibility of a work of this nature ever being carried out.

A structure depending on anchorages, which in the majority of cases could never be inspected even when first laid down, is not likely to obtain the confidence of the public, if even responsible contractors could be found who would be willing to undertake its construction in such an exposed position for any sum within measurable distance of Mr. Maxton's estimate of 5½ millions sterling.

It is curious that Mr. Maxton, in working out his scheme for connecting the railways of Ireland and Scotland, has, without knowing it, suggested a structure almost identical with that proposed by Sir E. J. Reed, who in 1886 patented "a system of connecting railways which are separated by rivers or other waters." Near the end of his paper, Mr. Maxton suggests that "in those cases where the conditions are favourable, the tubes forming the bridge could rest on submerged piers, thereby dispensing with anchors and cables, the buoyancy being resisted by any suitable means, such as filling in the space between the shells of the tubes with concrete."

This idea is certainly more practical, and such a method of constructing a submerged bridge was proposed (vide *Engineering*, May 24, 1889) and worked out in considerable detail by Mr. R. Lilljeström, a Swedish Engineer, for crossing the Sound between Elsinore and Helsingborg to connect the railway systems of Sweden and Copenhagen.

## COMPETITIONS.

SOUTH LONDON POLYTECHNIC INSTITUTES.

The following architects have been invited to submit designs in the preliminary competition for the proposed Battersea Institute:—Mr. J. Belcher, F.R.I.B.A.; Mr. C. A. De Boinville; Mr. H. C. Boyes, F.R.I.B.A.; Mr. H. H. Bridgman, F.R.I.B.A.; Mr. T. Chatfield Clarke, F.R.I.B.A.; Messrs. Henman & Harrison, A.R.I.B.A.; Mr. George Hubbard; Mr. J. M. MacLaren; Mr. E. W. Mountford, A.R.I.B.A.; Mr. Seth Smith; Mr. J. Osborne Smith, A.R.I.B.A.; Messrs. Roger Smith, Son, & Gale; Mr. Sidney R. Smith, A.R.I.B.A.; Mr. E. J. Tarver, F.R.I.B.A.; Mr. James Weir, F.R.I.B.A. The first set of designs are to be drawn to  $\frac{1}{4}$  in. scale, and from among the authors of these, six will be selected to take part in the final competition, when drawings to  $\frac{1}{8}$  in. scale are to be sent in. The preliminary designs are to be sent in on September 22. Mr. Rowland Plumbe is the assessor.



## NOTES.

**S**IR MICHAEL HICKS - BEACH stated in the House of Commons last week that it did not appear very probable that Parliament would be in a position to legislate further on railway rates this session, so much time having been occupied by the Board of Trade Inquiry. This was, of course, somewhat disappointing to those who were hoping for a speedy settlement of this question, but it is understood that Lord Balfour and Mr. Boyle are actively engaged in considering the evidence and other information gained during the inquiry, and that they hope to complete their two principal schedules by the middle of the present month. These will be based upon the two model schedules submitted by the London and North-Western and Great Western Companies, to whom they will be handed, in accordance with the provisions of the Act,—for approval or otherwise. It may be taken for granted that such modifications as were agreed upon by both sides after the introduction of the schedules will be given effect to in the revised tables now being prepared by the Board of Trade. The latter are very anxious that their labours may bear fruit this session, but this result depends upon the amount of favour with which their schedules are received by the parties interested. It appears that there is still the possibility that legislation may be proceeded with such a session.

**T**HE London County Council, at their meeting on Tuesday last, abandoned the Strand Improvement Bill. The first attempt by this body to carry through an important and urgently-needed metropolitan improvement has thus ended in failure. That the improvement will be made sooner or later cannot be doubted, but, at the same time, this failure is not to the credit of the existing Council. By introducing the principle of betterment in the Bill, they risked the carrying through of a much-needed improvement. If the principle is to be adopted, it must be adopted in all the cities of the kingdom, and should be established by a general and not by a local Act. If the County Council had proceeded on well-known lines, and had made use of the experience and intelligence of able and well-known surveyors, they might have been in a position to make the Strand improvement question a creditable one for their administration, instead of having to admit that the first attempt is a failure.

**A**S will be seen by our report of the meeting of the London County Council, that body has adopted the recommendations of its Building Act Committee as to the emoluments and status of District Surveyors to be hereafter appointed. As we said a fortnight ago, we doubt the wisdom of these changes, especially in the absence of any adequate attempt to re-cast the Metropolitan Building Act. From all that we can hear, some of the District Surveyors are themselves partially to blame for the outcry that has been raised against them as a body. Even Councillor Edis, who made a most able speech in defence of the District Surveyors, was constrained to admit that the system of "devilging" was felt to be a crying evil by many architects, builders, and building owners, who were willing to argue a point with a Surveyor, but not with his clerk. Other defenders of the District Surveyors urged that the dead-set which has been made against these officials in many quarters is due to their determination to see that the law is enforced without fear or favour,—that, in short, the opponents of the District Surveyors are those who have broken the law or have been baulked in attempts to do so. There is no doubt something in this view of the case.

**I**N the July number of the *Nineteenth Century* Mr. James Knowles, the editor, contributes a short and forcible article combatting the idea of adding a monumental chapel to Westminster Abbey, returning to

the proposition he has formerly supported, that there is plenty of space in the cloisters for memorial-tablets, and that the cloister is really an integral portion of the Abbey and shares in its associations, which of course no new monumental erection, tacked on in modern times, could be. Referring to the objections previously made, that the cloister wall space was already fully occupied, he gives a sheet of elevations of the four cloister walls, showing the position and size of all the existing tablets, and showing that there is actually three-fourths of the cloister wall space unoccupied: "about 1,700 superficial feet are covered by existing monuments, and more than 5,000 superficial feet are vacant. This is more than three times the total wall-space of Poet's corner!" It may be partially objected to this that many of the present tablets are so placed as to cut up the wall-space into a number of small irregular patches not very available for additional tablets; but this is only the case in a minority of the bays. Mr. Knowles's article and illustrations are exceedingly well-timed, and appear to us conclusive against the necessity or reasonableness of adding a modern chapel to the Abbey, even apart from reasons of sentiment which point against such a proposal. It may be asked, if Mr. Knowles is so clear on the subject, why did he give so much space in his magazine to the preposterous proposals of Mr. Shaw-Lefevre, who is one of the least competent persons that could be found to deal with such a subject?

**I**N connexion with the Architectural Exhibition to be held at Turin in September, the municipal authorities of Berlin have been formally requested to sanction an exhibition of models, drawings, &c., of such public works in the capital as have been erected under their supervision during the last ten years. After due consideration of the question, the authorities have determined to send the plans and elevations of a certain number of lately-completed buildings, but will abstain from sending in any models. Has our County Council received any similar request from the Managing Committee at Turin? If so, we hope that the visitors of this exhibition may see English work better represented than those did who entered the hall of the "exhibition of works pertaining to the housing, &c., of criminals" held at St. Petersburg last month, in connexion with the "Congress," and at which we hear, England had but a poor show in comparison to Germany, Austria, Italy, &c., not to speak of France.

**T**HE Report of the British School at Athens, read at the annual meeting on Wednesday, gives a most satisfactory account of the work that has been done, and it is very gratifying to learn from the report of the Director, Mr. Gardner, that though we were late in the field the British School at Athens is twice as numerously attended as any of the others. Mr. Gardner gave an account of the work carried on by various gentlemen connected with the school, Mr. Loring, Mr. Bickford Smith, Mr. Schultz, Mr. Barnsley, and others; Mr. Tubbs read his report of work at Cyprus, and Mr. Loring that on his work at Megalopolis. The unsatisfactory part of the matter is the want of adequate assistance in the way of funds towards all this interesting work of exploration, which may be said to be carried on in the teeth of absolute poverty of financial means. Surely, for the credit of England, some public money should be voted to assist in these explorations, carried on with so much spirit, and which are so valuable in an artistic and historical sense.

**T**HE competition for a "Soldier's Monument" to be placed on the summit of the historical Kyffhäuser, has been decided this week, and we again find the talented "monument specialist," Herr Bruno Schmitz, the winner of the first prize, this time with a Medieval tower-shaped erection, placed on a scheme of terraces, and brought into connexion with an

equestrian statue of the Monarch who is to be memorialised, together with a legendary representation of King Frederic Barbarossa, sitting in an open niche. Although very fair prizes were offered, this competition was by no means of a high standard; of the twenty-eight designs sent in some showed most wretched work, both in composition and technique, and one or two (especially design No. 4) might have been thought to have emanated from a lunatic asylum. The designs classed second and third are both based on a similar idea to that of the first one, and the outward resemblance of these three pieces of work will be sure to strike most visitors. A characteristic incident in connexion with the competition is that the young Emperor, on the 24th inst., visited the hall in which the competition designs had been placed for inspection by the jury, and that, after spending some time in examining the models and drawings, he called the members of the jury together and gave these gentlemen his ideas on the subject, going so far as to even mention those designs which, according to his view, alone merited consideration. As in Germany it is still pretty well the case that the Emperor's word is law,—people may grumble, but they do not run counter to edicts from high places,—it may be imagined how far the jury were likely to be unfettered in their choice. We may certainly congratulate ourselves that we are emancipated from this kind of thing in England.\*

**T**HE annual "Academy Exhibition" of Berlin, held this year in the well-lighted buildings of the Landes Anstaltungs Park, was opened on Sunday last, the private view having taken place the afternoon before. This exhibition has, since the organisation of a similar one at Munich, been by no means a fair representation of German art, the works of South German artists being very scarce in comparison to those of the North Germans, and more especially the Berlin School, who are here master of the situation as regards quantity, although, as is well known, they are not in the same position as to quality. The proportion of the works sent in for consideration to those afterwards accepted was as four to three, and it is to be feared that the jury thought more of filling the extensive wall-space than of securing a high standard of work. The catalogue shows 1,649 numbers, of which 1,016 are oil paintings, 260 water-colours, 181 sculptures, 66 black and white, and only 25 architectural. There may be some consolation for English architects in knowing that the German architectural room is here treated in a far worse way than our London one, the few designs being hung in a kind of secondary connecting passage between two halls; but even this position is too good for the wretched show of designs. Of the 25 numbers in the room, eight are appended to various church designs by Professor Otzen, whose style we had occasion to see this spring; these have their merits in regard to design and drawing, though few English architects will admire their style. Only one other sheet is worthy of special mention, and this is the one signed by Prof. Schäfer and Reg. Baummeister Hartung, on which we find the elevation of a very original design for a private residence.

**T**HE Liffess system of electric traction, for tramways and railways, is now being shown in operation on a short length of line laid down at the depot of the West Metropolitan Tramway Company, Chiswick. The great difficulty hitherto experienced in propelling trams by electric power, has been that of getting the power into the car. A motor is geared directly to the wheels, and

\* Since this comment was written, we hear that the Special Committee of Members of the Reichstag has just decided that both choice of site and form of monument should be left entirely to the Emperor. The leader of the Opposition, Herr Richter, wished to have the opinions of competent persons laid before the Committee; an animated discussion ended by the above decision receiving 13 votes to 1.—So much for art and autocracy!



current is supplied to it in one of two ways: secondary cells can be placed in the car itself, and an ordinary track used, but the cost of working such a system is high, owing to the great weight of the cells which have always to be carried, and the delays caused by the re-charging that has to be done two or three times a day; in other systems, a dynamo-machine is placed in some convenient position, and the conductors from it carried overhead, or underground, like telegraph wires, a sliding contact attached to the car pressing against the conductors and leading the current to the motor in both cases. The objections and risks inevitable with overhead wires are self-evident; and a continuous slot in the road, into which the contacts from the car dip, to touch the conductors, is hardly less objectionable, as water and mud are constantly getting into the channel. The special feature in the Lincoff system is the ingenious means by which the current is conveyed to the motor in the tramcar. One terminal of both the dynamo and motor is connected to the ordinary rails,—that is, an earth return is used; the lead from the other terminal of the dynamo is a bare cable laid in a trough of earthenware, or other suitable insulating material, sunk below the level of the road in a channel, running parallel to, and a few inches from one of the rails. On the top of the bare cable lies, in contact with it throughout its whole length, a flexible ribbon made of short lengths of hoop-iron rivetted together. Recessed into the road immediately above this ribbon are plates of iron a few inches across and 3 ft. long, placed end to end, insulated from one another, and with their upper surfaces exposed in the road. The tramcar carries a powerful electro-magnet, with its two pole pieces placed immediately over the iron slabs, and so far apart that the poles are always over two of them, these latter become magnetised by induction, and pull up the hoop-iron into contact with their lower sides. As, therefore, the car passes along the track, the pieces of iron immediately under it are in direct metallic connexion with the conductor from the dynamo, and the current is taken to the motor by travelling brushes attached to the two ends of the car, and resting on the iron in the roadway. Nothing could be much simpler than such an arrangement, and it will be interesting to see how the system will work on a longer track. In wet weather there will evidently be considerable leakage over the surface of the road, and should water get into the channel containing the conductor it seems as though it would be fatal to successful running.

THE London Overhead Wires Bill was defeated last week by a majority of three; it is surprising the majority was not larger. To seek to give new and rather despotic powers to companies for the fixing of posts and wires on private houses, at a time when it has become obvious that the reign of overhead wires must shortly be put an end to, seems a somewhat preposterous piece of legislation.

A PLAN has been prepared by Mr. Joseph Boulton, a well-known Liverpool architect, for a special harbour and breakwater near the north end of Liverpool Docks, to allow of first-class ocean-steamers landing their passengers and cargoes without the intervention of "tenders." It would no doubt be a great convenience, but how would it effect the scour of the river and the tendency (already formidable) to the further development of the bar at the mouth of the Mersey?

WE have previously referred (May 17, p. 353) to the various new waterway communications now being planned in Germany. We purposely avoided mentioning the Berlin Sea Canal scheme which has been often talked about, and has of late been busying some minds, chiefly though from the theoretical technical point of view, whilst the financial side has been somewhat neglected. Now, however, that the idea of this "sea canal" seems to be gaining ground, and is likely also

to afford interest to non-German engineers, it may be well to mention that those working out the question have, as yet, not been able to come to a definite conclusion as to the advisability of having a connexion direct to the North Sea on the one side, or direct to the Baltic on the other, and that hence a working out of special routes has only to be done in a rough form. As far as we can ascertain, the most competent judges are in favour of but one route,—from Berlin by Eberswalde and Stettin to the Baltic,—rather than the two ways of reaching the North Sea, i.e., either via Harburg or via Homburg. To give an idea of the dimensions of the scheme, it may be mentioned that the Berlin-Baltic Canal would be some 158 km. in length, and would cost some 8,000,000*l.*; that a canal via Homburg would have a length of some 273 km., would require the removal of 115,000,000 cubic metres of ground, and is estimated at 12,000,000*l.*; and that a similar canal via Harburg, 269 km. long, with a removal of 145,000,000 cubic metres, would require some 14,000,000*l.*

WE understand that the Metropolitan Railway Company have purchased Wembley Park, between Neasden and Harrow, and are about to build a station there, and "develop" the property for building purposes. The position of the Metropolitan Railway differs in one respect from that of any other line in the kingdom, for this railway has a "surplus land stock," the dividends on which arise from rents and profits on the sale of so-called surplus lands. It is a little difficult to understand how Parliament came to sanction the taking of so much land, which could never be required for the purposes of a railway alone, or allow powers to be inserted in the Act to enable the Company to purchase property for building purposes. The fact is, that the Metropolitan Railway is not only a railway company, but also a land company. In the colonies it has not been uncommon for grants of land to be made to railway companies, but the practice has never been usual in this country; but as railway enterprise has in England but little new ground open to it, the instance of the Metropolitan Railway is of little value as a precedent, and is rather a curiosity of railway law and practice than anything else. But the shareholders in this line may be thankful that the promoters obtained the extensive powers in this respect which they did, for it was only by means of the surplus land that this line paid dividends of four and five per cent. before the division of the stocks into railway ordinary and surplus land stocks.

NOTHING is more noticeable at the present time than what may be termed the competition of watering-places. A short time ago we took note of the fact that the authorities at Eastbourne had established a system of sanitary certificates for lodging-houses. We have now to record the fact that last week the Corporation of Scarborough opened, under the auspices of the Duke of Clarence, the new sea wall, promenade, and gardens, on the north side of the Castle Hill. This is a work which the inhabitants may well regard with satisfaction, being not only an attraction to visitors, but a solid and permanent piece of engineering work, which will primarily serve to prevent the encroachment of the sea. Those who prefer nature to art will hear with regret that it is proposed some day to continue this work round the head, and so connect the north and south parts of Scarborough by one sea wall and promenade; for the ragged bit of head to the north of the harbour is about the only piece of nature to be found in Scarborough itself. However, there is plenty of fine, unconventional scenery in the valleys and moors at the back of Scarborough and along the coast-line for those who dislike the madding crowd; and it must be admitted that the constructive and sanitary state of Scarborough well justifies the local pride of its inhabitants. They have only to follow the example of Eastbourne,

and have the lodging-houses certificated for sanitary purposes, to still further increase the popularity of the place and its healthfulness as a seaside resort.

YET another of the City churches is marked for speedy destruction. All Hallows-the-Great-and-Less, in Upper Thames-street, has remained closed during some while past, by order, we gather, of the Commissioners of Sewers, who found that the substructure is in an unsanitary condition. We read in the *St. James's Gazette* that, pending the result of a commission already issued by the Bishop of London for uniting these two parishes with one adjoining, the necessary works will not be undertaken; and there is every likelihood that this church will not survive, following in the fate of its former neighbours St. Michael Queenhithe and St. Mary Somerset. It was built by one William Hamon, mason, says Hutton, after the designs of Wren, at a cost of 5,641*l.* 9s. 9d., and was completed in 1683. "The interior of the church," writes the late George Godwin, "is neither square nor parallel, resulting probably from the endeavours of the architect to use such of the old walls as were available; nor has it much architectural character. . . . The exterior has no feature of beauty or interest: the square massive tower, crowned by a cornice and open parapet, was probably intended to receive a spire at a future opportunity, and has an unfinished appearance about it." The tower has since been pulled down to widen the thoroughfare. The altar-piece is decorated with a Corinthian order, and has stone figures of Moses and Aaron. Another stone figure of Gabriel supports the communion-table. The church contains a carved oak choir-screen, with two side pediments and a larger central pediment, which bears an eagle and the Royal arms. This fine piece of work was made in Hamburg, and given, it is believed, *temp.* Queen Anne, by some Hanse merchants in commemoration of their former settlement in the neighbouring Steel-yard.\* The organ was built by Glyn and Parker. Boyce was for some years organist to this church.

THE sale of Gibson's "tinted Venus" on Saturday last at Christie's, does not appear to have attracted much notice; it went for 1,837*l.* 10s., not much of a price for a work which was once regarded as the leading production of the leading English sculptor of the time. We had not an opportunity of seeing it on this occasion; but if it is, as the *Times* description gives it, coloured only in the hair and eyes and parts of the drapery, the colour on the nude parts of the figure must have faded; it certainly was there once, a very delicate warm stain, just suggestive of flesh-tint, and not obscuring the crystalline surface of the marble. That the nude portions of a statue should not be left raw white marble, but be artificially warmed in tone by a stain, was one of the points on which Gibson strongly insisted, and he would certainly not have made such a blunder as to colour the hair and eyes of a statue left otherwise in the raw marble. The statue was bought, it is said, for Messrs. Pears, the well-known soap manufacturers. *Sic transit gloria!*

THE paintings by the Russian artist, Ivan Aivazovsky, now on view at the Goupil Gallery in New Bond-street, are undoubtedly powerful in their way, but it is not a good way. They are mostly landscapes and seascapes giving peculiar effects of light and colour, many of which savour more of scenic effect than of the study of nature. The two coast views at Biarritz (Nos. 1 and 4) are among the best, and two studies of calm sea with cumulus clouds hanging over the sea in piled-up masses, are fine and less stately than others of the paintings. The shipwreck scene, "The Supreme Moment," is indeed tremendous in its way; but waves on such a scale as this (having reference to the size of the masts, &c., of the sinking ship), were

\* For "The Hansards of the Steel-yard," see the *Builder*, October 27, 1888.



never seen in the modern period of this planet, except perhaps in the case of the waves developed by the earthquake and eruption of Krakatoa.

**T**HE President of the Royal Institute of British Architects (Mr. Alfred Waterhouse, R.A.) has issued cards for his *Soirée* at the Natural History Museum, South Kensington, on Tuesday next, by permission of the Trustees of the British Museum. Judging from the programme, and from recent *conversations* of learned societies which have been held in the same building, the Institute *Soirée* is likely to be a great success.

#### LETTER FROM PARIS.

THE two rival Salons have closed their doors, and the Palais d'Industrie is already undergoing the necessary transformation for an approaching Industrial Exhibition. The Palais des Beaux-Arts remains for the present awaiting what will be done with the whole Champ de Mars site. Many persons still regret very much the decision to retain the comparatively ephemeral and showy buildings at the lower end of the Champ de Mars, which have only a temporary interest or utility; and think it would have been far preferable to preserve only the more monumental and architectural buildings of the Palais des Beaux-Arts and Palais des Arts Libéraux, which would moreover have grouped admirably with the Palais de l'École Militaire, one of Gabriel's best works. On the other hand, every one will be pleased to see the proposed transformation of the Champ de Mars area into a great square ornamented with statues, the formation of which will have the effect also of raising the status and value of some of the adjacent habitable quarters of Paris.

The Ministry of Fine Arts has been occupied with the annual awards to artists, and M. Antonin Proust, acting as champion of the new Salon, has fulfilled his intention of demanding that the funds for the travelling studentships and the Prix du Salon should be applied indifferently to both Salons. Naturally such a proposition has met with some strong opposition by those who urge that the Société des Artistes Français has for some years past rendered great services to art, and to artists in need of assistance; and in the end this view has prevailed, and in spite of M. Proust's protestations, the funds for the awards above referred to are to be entirely retained, as formerly, by the old Salon. M. Félix Charpentier has obtained the Prix du Salon. He is a young sculptor, author of a group, "Les Lutteurs," which has been much admired this year. The municipality purchased from him, some years ago, the marble fawn which is now in the Parc Monceau.

The travelling studentships in Architecture have been awarded to M. Alphonse Conin, M. Chas. Breffendille, M. Fernand Dupuis, and M. Emmanuel le Rol. An active campaign has been made this year by the landscape-painters for the Médaille d'Honneur in painting, which has been successful, and the medal has been awarded to M. François. This is the first time a landscape-painter has obtained this honour, which was never awarded to either Corot, Daubigny, or Dupré. M. François is the senior French landscape-painter now living, being seventy-five years of age. He exhibited this year a "Vue de la Sèvres à Clisson" and "Matinée Bremaise." He is not only an artist of considerable power, but esteemed also as a man of very generous character, and who has been a friend to many artists in distress. In sculpture no medal of honour has been awarded.\* In architecture M. Redon has carried off the medal by 41 out of 71 votes.

The Committee of Painting has also awarded two special prizes, the one founded by the Raigecourt-Goyon family in memory of the late Comtesse de Goyon, and the other by Marie Bashkirtseff, the young Russian artist who died two years ago, and whose remarkable posthumous memoirs have given her more fame than she lived to acquire by her paintings. The first of these prizes has been awarded to M. Armand Guéry, the second to M. Paulin Bertrand.

Among noteworthy exhibitions is that of the etchings of Chaigneau the animal painter, in

\* We cannot avoid expressing our astonishment at this result. Most English critics, we believe, would consider that landscape in the Salon was rather weak this year, and the sculpture incontestably the finest portion of the Exhibition.—Ed.

the Boulevard Poissonnière, and that of a painting by Roybet in the Georges Petit Gallery. The latter has attracted great attention during the month by the power and originality of the one work, and the painter's absolute disconnection from the current fashions of painting. The painting represents Charles the Bold at Nèfle, commanding the massacre of the populace who had taken refuge in a church. This painting of a scene of carnage is a masterly work, showing artistic qualities of the highest order, but it is confused in effect for want of a sufficiently marked central point in the composition.

The Company of the Chemin de Fer de l'Ouest has made a happy innovation in decorating the large hall of St. Lazare station with a series of oil and water-colour paintings of the watering-places of Normandy and Brittany. These are painted by M. Eugène Bourgeois, a young artist who has often exhibited in the Salon, and they form a welcome contrast to the vulgar transparencies exhibited by the company last year.

M. Antonin Proust, who must be credited with a real if not always well-directed zeal in matters artistic, has proposed to the Chambers the formation of a museum fund (Caisse des Musées) to facilitate the purchase of works for museums in Paris and in the provinces. The fund would be administered by an honorary committee presided over by the Minister of Fine Arts, and would receive an annual grant of 500,000 francs. Anything not expended in one year would be carried over to the next, so that an accumulation might be formed which could be utilised on occasion to secure for France important works, which might otherwise go out of the country. This proposition, supported by a strong group of Deputies, will shortly come under discussion.

The Louvre continues to receive new contributions; the last was a very fine portrait by Ricard, left to the Museum by the late M. Heilbuth, who also left to it one of the best of his own works. This, however, according to the rules of the Louvre, will have to be deposited in the Luxembourg until the expiration of the ten years which constitute a deceased painter an "old master." There has also arrived at the Louvre a very fine example of Corot, not from the Luxembourg, but from the Château de Compiègne, where the "Direction des Bâtimens Civils" had forgotten it.

Among the works now going on at the Louvre is the preparation for definitely installing the Dieulafoy collection in the Gallery of Persian Antiquities. This gallery, which has been decorated by MM. Rude and Chaperon, will contain among other curiosities the reduced model of the Assyrian Palace, the Apadana, which was exhibited in the Palais des Arts Libéraux last year.

A new gallery of casts has been opened in the museum of comparative sculpture at the Trocadéro. This gallery, the contents of which are of the highest interest, occupies the west wing of the Trocadéro Palace, given up last year to the interesting loan collection of Medieval art. The contents of the completed gallery of comparative sculpture, in the east wing, were described at some length in an article in the *Builder* of August 10, 1889. The new collection in the west wing is arranged as follows: it is divided into six compartments, symmetrical with those of the opposite wing. The first five are devoted to works dating from the eleventh to the eighteenth century. The sixth compartment is devoted to specimens of Cambodian architecture and sculpture brought home by the Delaporte mission. The compartments are divided by reproductions of ancient gateways, which were already in place there last year, and were described at the same time as the contents of the east gallery.

This installation in his building ought to be a satisfaction to M. Bourdais, the architect of the Trocadéro; who however is not happy, because the neighbourhood of the Eiffel Tower will not let him rest. He also had his scheme for a 300 metre tower which has not been accepted, and in despair of that, he is now exhibiting to the tradespeople of the Palais Royal a design for a tower 100 metres high in stone and crystal. This new edifice, which no one wants, he proposes to construct at one end of the Palais Royal, with all the apparatus of restaurants, fountains, and coloured lights in connexion with it. He urges that this will give new life and prosperity to a quarter now almost deserted as far as evening amusements and fêtes are concerned. It is not likely however

that M. Bourdais' tower would do much to avert what seems the tendency of all Parisian life to flow westwards.

This same westward tendency has increased so much that this quarter of Paris is getting inconveniently crowded, being, so to speak, compressed against the old fortification line; and the deputies of Paris, with M. Georges Berger at their head, have renewed the representations to the Minister of War, made already in 1883, for the entire removal of the fortifications. Several changes of Ministry have taken place without the matter being advanced, thanks to the *inertie* of the military mind. While it is recognised now that these fortifications do not in any way meet the requirements of works to stand against modern artillery, and that since the construction of the new forts they are really of no use, still the Comité Supérieur de Défense puts its veto on all attempts to remove them.

This time however there seems some chance of success, as one of the promoters of the attack on them, M. Guyot, is now Minister of Public Works, and his assistance therefore may be counted on; and the demand now made is not for the dismantling of the whole, but only for the portion between the Seine and St. Ouen. The river takes at this point a curve parallel to the line of the fortifications, and constitutes a natural defence protected by the forts of Issy and Valérien; and by removing the fortifications at this point the limits of Paris would be given an area of 430 hectares where the population of Paris could find new and healthy and cheap sites for habitations. This is therefore a matter of great interest in regard to the threefold question of hygiene, construction, and public economy; and the Minister who can get round the routine of the military engineers will earn the thanks of Paris.

The candidates for the place in the Institut left vacant by the death of Robert-Fléury are M. François, M. Dédalle, M. Emil Lévy, M. Joseph Blanc, and M. Jules Lefebvre. The Académie has added to these names that of M. Benjamin Constant, M. Olivier Merson, and M. Harpignies. The Académie des Beaux-Arts has also to fill the vacancy in the ranks of its corresponding members left vacant by the death of Mr. Herbert. The following candidates were proposed: Mr. John Burn; M. Pradilla, of Madrid; M. Kroyer, of Copenhagen; Mr. Herkomer; and M. Valbez, of Stockholm. Mr. Herkomer was elected.

The Academy has proposed M. Eugène Gaillarde to the Government, to succeed M. Hébert at the Villa Medici, the term of office of the latter artist expiring on January 1 of next year.

The École des Beaux-Arts has just decided the competition of the first class in architecture, the subject being "a palace of national archives." Among seventy-six designs, second medals were awarded to M. Monjaux (pupil of MM. Gerhardt and Rémon), M. Duquesne (pupil of M. Pascal), and M. Bailie (pupil of MM. André and Lalou).

M. Roger Ballu, the son of the eminent architect, has been named a member of the Committee on Works of Art, in place of the late M. Ph. Barry, who recently died suddenly of apoplexy. He was one of the most able art critics of the day and one of those whose word had most weight. He (like a good many other critics) commenced as a painter and gave himself up subsequently to art criticism, to which he brought rare faculties both of style and judgment. He was a contributor to many reviews, French and foreign, and besides published a good many separate treatises. He was Chevalier of the Legion, Inspector of Fine Arts, and Member of the Committee of the Société des Gens de Lettres; and was also a great collector, with a passion for Japanese art, which he did much to popularise.

THE ROYAL SCOTTISH ACADEMY, EDINBURGH.—Mr. William McEwan, M.P., has given 5,000*l.* to Sir William Pettes Douglas, President of the Royal Scottish Academy, for the purchase of a picture or pictures for the Scottish National Gallery. It has been, for some time, the desire of Mr. McEwan to procure for the gallery an example of Rembrandt, and it will be the endeavour of the President to secure a work of that master.

WAGES IN THE BUILDING TRADE AT HANLEY.—At a meeting of master builders, in Hanley, on June 26, it was resolved to grant an advance of wages of  $\frac{1}{2}$ d. per hour.

\* One hectare = 2·4736 acres.



## THE MONTPELLIER BATHS' COMPETITION, HARROGATE.

The action which the Corporation of Harrogate is taking in extending the bathing accommodation of the town is one for which there is every need; and as the steady increase in the number of bathers has rendered the accommodation of the Victoria Baths quite inadequate, the Corporation has decided to build premises containing vapour, air, and douche baths; cooling, pulverisation, and inhalation rooms; Turkish baths and massage-rooms; with spacious Winter Garden and concert-room attached. It is intended that the new building should provide a bathing establishment surpassing all others in excellence.

In the competition which has just been decided, every effort has apparently been made to secure impartiality, and the result may be considered satisfactory.

The plans which have been accepted are likely to provide the town of Harrogate with buildings designed with every care and consideration for the objects in view.

The competition was divided into preliminary and final portions, and out of the authors of the twenty-six sets of sketch-designs four were selected to prepare more elaborate designs.

The Assessor, Mr. Corson, of Leeds, completed his scrutiny of the four sets of designs, and awarded the order of merit as follows:—Messrs. Baggallay & Bristowe, London; Messrs. T. & F. Verity & W. Phipson, London; Messrs. Ellison & Son, Liverpool; Messrs. Morley & Woodhouse, Bradford.

We are entirely in accord with Mr. Corson's decision, and careful examination of the drawings will show that the award is a wise one, and that the best design submitted has every probability of being carried out.

The site is of irregular four-sided shape, and the levels of the surrounding roads vary to a large extent. It is greatly to be hoped that the Corporation will see their way to carry out their suggestion by removing the row of shops occupying a corner of the site; such a step would greatly improve the aspect of the gardens and would give room for a slight expansion of the plan in this region, which would be in several respects most desirable.

The four final competitors have all placed the principal front entrance in the Crescent-road, and have also wisely confined the building to this side of the site, placing the Winter Garden against this block, so as to occupy a central position on the site and still to leave a considerable space before to be laid out as grounds.

Many of the other competitors have crowded the site by providing too extensive a Winter Garden.

The preliminary instructions to competing architects deserve a word of notice. The information given was confined to as few leading points as possible, and much was left to the individual ingenuity of the architect. This arrangement is in striking contrast to some instructions, which are but too often a bar to the designing of a really good building.

Messrs. Baggallay & Bristowe, who, by the resolution of the Corporation, have been appointed architects to the building, have carefully grouped their plan around a central hall placed well in the centre of the block and surrounded by doctor's consulting-room, manager and porters' rooms, chairmen's waiting-room, &c. The principal entrance, with dome over, occupies the centre of the Crescent-road frontage and leads straight into one end of the central hall. At the opposite end of the hall, a vestibule, with refreshment and reading rooms on either side, leads to the Winter Garden, running along the back of the building and at right angles to the vestibule. In the centre of the gardens and in line with the central hall, an octagonal domed pump-room is placed, with a covered way from the Winter Garden.

The ladies' baths are placed on the left of central hall, and the gentlemen's baths on the opposite side. Each section is approached by corridors at right angles from centre of hall.

The provision of large areas in each of the last-named blocks gives facilities for external lighting and for placing the water-closets and lavatories against external walls—a point which has not been so ably treated by the other competitors.

One of Messrs. Baggallay & Bristowe's special features is the straight corridor running from Montpellier-road to the central hall. A slight incline from the hall would give easy access for

bath-chairs to the central hall, and thence to all parts of the building.

The planning of the building on one floor cannot be too highly commended, and the advantage of this arrangement is at once apparent by comparison with the three other designs, each of which places some portion of the department on a first floor.

The corridor last mentioned, running parallel with the Winter Garden, has pulverisation, cooling, and inhalation rooms on the south-east side, whilst the Turkish bath is placed in the south-east angle, adjoining Parliament-street entrance and Winter Garden.

The lighting of the Turkish bath will, of course, be from the top, but there is nothing to indicate this on the plans. The steps between the rooms are a questionable advantage, and, we should think, might be easily dispensed with.

The stipulation that the height of dressing and bath-rooms be not less than 15 ft., has been taken advantage of to give external light over the corridors, which have been kept low, and this treatment has been most successfully carried out by Messrs. Baggallay & Bristowe. The competitors have, without exception, adopted a Renaissance style. Messrs. Baggallay and Bristowe's treatment is fairly successful. Domes form prominent features, and the square towers rising from the centre of the building are gracefully designed and serve a double purpose in the position assigned to them, being used for storage tanks and for smoke and ventilation shafts.

It is to be hoped that in the execution of this building some decided effort will be made to introduce colour into the elevations; the dull aspect of the buildings of Harrogate built with the local stone is most conspicuous and depressing.

The designs placed second, prepared by Messrs. T. & F. Verity and W. Phipson, of London, deserve all credit for the care with which they have been drawn, and for the grace of the elevations. The plan, though good in parts, cannot, however, be compared to the simplicity of the plan of Messrs. Baggallay and Bristowe. The corridors are involved, and are not straight from the central hall. Advantage has been taken of the height, previously mentioned, of the baths and dressing-rooms, but the advantage gained by placing the water-closets, lavatories, and urinals against external walls, even though of internal areas, cannot be too much insisted upon, and the expedient of closets opening direct from dressing-rooms is a questionable one. The areas provided are much too small for their purpose.

The provision of some portion of the establishment on the first floor is a disadvantage. Messrs. Verity provide ladies and gentlemen's dressing-rooms over the entrance, and a gallery surrounding the central hall leads to massage-rooms on each side. A large staircase gives access to this portion of the building from ground floor.

The elevations are distinctly the best part of this design, and are far in front of the two remaining designs in every respect.

The design placed third, submitted by Messrs. Ellison & Son, of Liverpool, differs from the two previous ones in several important respects, and though the elevations cannot be commended, the idea of the plans has been methodically worked out.

Unlike the others, Messrs. Ellison & Son have placed the principal entrance at the corner of Crescent-road and Montpellier-road.

A feature of this entrance is a covered carriage shelter, with double doors at each end for closing, if required for special cases, and a long incline for bath chairs.

A large hall behind the entrance has staircase and lift on right-hand side, and on the left two straight and parallel corridors branch off towards Parliament-street, and parallel to Crescent-road (which is straighter than its name implies). A large area between them gives the necessary light and air.

The Turkish bath has been placed in the Crescent-road front, and the rest of the space is occupied by the gentlemen's bath.

From the second corridor already mentioned, a corridor at right angles leads directly into the Winter Garden, which is at right angles to the block, and runs across behind the existing shops in Parliament-street. The pump-room has been placed in the centre of the Montpellier-road front, and a covered colonnade runs from this point in front of the Winter Garden. The design of this colonnade is exceedingly poor.

The first floor, approached by staircases and lift, contains the ladies' baths. The corridor has been extended at great trouble, and carried through to form a communication with the gallery of Winter Garden. The advantage of this is not very apparent.

Smoking and billiard rooms are provided on this floor, but we cannot admire the arrangement of reading and writing rooms leading out of one another, and ultimately to a lavatory, urinal, and water-closet, to which there is no other access.

The position of the tower at the corner of Crescent and Montpellier-road cannot be said to improve the design.

The detail of this design is disappointing; the stone balusters to parapet are especially weak and poor in character.

The elevations of the design submitted by Messrs. Morley & Woodhouse, of Bradford, are in some respects of better character than those of Messrs. Ellison & Sons. The frontage to Crescent-road is very flat, and sadly needs relief. The provision of a carriage shelter is a good suggestion, though examination of the existing shelter to the Victoria Baths shows that the use of this accommodation is almost entirely ignored by both visitors to the baths and drivers.

Messrs. Morley & Woodhouse have set their lines of frontage back from the road some distance, and if this would save some of the trees which abundantly cover the site the thanks of the inhabitants would have been gained.

The entrance, in the centre of Crescent-road, leads directly into a waiting-room or lounge, and a cooling-room. From the latter the ladies' and gentlemen's baths are reached, and the inhalation and pulverisation rooms intended for the use of both sexes. The Turkish baths have been placed in the corner by Parliament-street, with separate entrance from the grounds.

The Winter Garden is placed at the back, parallel to Crescent-road, with large pump-room at one end, occupying the centre of Montpellier-road.

A tower at the corner of Crescent-road and Montpellier-road adds but little to the harmony of the design.

The arrangements for ventilation and drainage are but barely indicated upon this set of plans. This is in striking contrast to the fullness of details given by Messrs. Baggallay & Bristowe to these most important points.

The sketch-plans which were submitted, but never developed, are not without interest.

A very bold design may be mentioned, with the entrance at the corner of Parliament-street and Crescent-road. An octagon hall, with elliptical waiting and reading-room behind, ultimately leads into a central pavilion of the Winter Garden, with semi-circular colonnades on each side. The disposition of the baths behind the circular colonnade, and facing Crescent-road and Parliament-street, is thoroughly original.

The decision of the Assessor, Mr. Corson, will be endorsed, we think, by all who will bestow upon these designs a careful examination.

## A SMOKE ANNIHILATOR.

ACTS of Parliament have been passed and fines inflicted for the production of smoke nuisances, but for all that smoke prevails; and the prosecutions are not actively waged, mainly because—if the truth may be spoken—it is tacitly admitted as rather hard, if not actually unjust, to fine for a nuisance when the offender cannot be directed to any certain or efficient remedy. Good stoking has so far been the best remedy, but as good stokers cannot always be relied upon, there is need for some reliable mechanism which will neither tire nor fail in its operation. In the pretty country town of Newbury, in Berkshire, an important industry has recently sprung up in the wood-joinery establishment of Mr. S. Elliott, where a large amount of admirable artistic work has been turned out, and which has already gained gold medals from five public exhibitions of note. Steam power had to be employed for these works to dry the wood and drive machinery. The saw-dust, shavings, and other waste had to be got rid of, and the easiest and cheapest mode of course was to burn them as fuel. The inhabitants objected to this process, and the energetic proprietor was fined. It was not to be expected he would cease the consumption of this class of fuel, but it was not





The Old Church House, Chelsea.

agreeable\* to be in antagonism to his neighbours. So Mr. Elliott struck out a course for himself—an original, simple, and effective one. He seizes the black smoke as it comes away from the furnace, and washes it clean before he lets it go into the atmosphere. To do this, he stops the smoke in the chimney by a trap. He then draws the smoke away by a rapidly-revolving fan and delivers it into a closed tank of water, through a central perforated revolving tube, carrying several beaters which expeditiously commingle the water and the smoke. The carbon and solids are precipitated and the sulphurous and other acids absorbed by the water. The heat of the smoke converts a portion of the water into steam; and there passes off from the tank funnel only the vapour thus caused and the thoroughly cleansed nitrogen and partially consumed air, which has passed through the furnace. This vaporous mixture is absolutely inodorous, and a white handkerchief held in it will neither become impregnated with fumes nor stained by smuts.

A very numerous party of engineers and experts inspected last week the invention attached to a 100 horse-power boiler in Mr. Elliott's works; and all concurred that the apparatus was justly entitled to the name of "smoke annihilator" which the inventor has applied to it. Dense columns of smoke were allowed to arise in the ordinary way from the chimney. Then the apparatus was switched on, and the black smoke ceased, an equal volume of pure white steam supplanting it. This quickly dispersed like the steam from a locomotive on a hot summer day. The carbonaceous and other products may be from time to time removed from the water and applied, if worth the trouble, to some economical purpose. Numerous specimen-boards were shown, painted in various greys, greens, and browns, both in flat and varnished. The carbon thus obtained is exceedingly fine, and may probably be on a par with the finest lampblack. We are not inclined, however, to lay any stress upon the commercial value of these bye-products, which, if turned into the drains, can do no harm and may do good in proportion to the quantities of smoke washed and the amount of materials extracted. The annihilating apparatus neither occupies much space nor is it costly. The dimensions of the tank in the present instance are 4 ft. in length, 4 ft. 6 in. high, and 2 ft. 6 in. broad. The fan is a small one, adapted to its duty, and runs at about 2,000 revolutions per minute, whilst the beaters run at about 200 revolutions. About 1½ horse-power is probably the extent of steam drawn from the boiler for working the fan and the beaters,—so the expense of running the apparatus is slight. On the other hand, the fan acts as an exhaust to draw through the furnace a regular and good supply of air, and as a consequence the combustion is improved to the extent, as has been tested, of 4 per cent. of the fuel required. Another point is worthy

of notice. The iron chimney which was 80 ft. high previously has been reduced by 40 ft. The Mayor and several members of the Corporation of Newbury were present, and gave satisfactory testimony to the local appreciation of the invention. It would be, indeed, a pity if the increasing developments of industries should be incompatible with the retention of ruralty by the town; but by this novel smoke-washing process the untarnished beauty of the country and the welcome profits of industry may, seemingly, thrive side by side without antagonism. On shipboard the new process may well receive attention, for the smoke of steamers on the water is scarcely a less nuisance than the smoke of factories on the land—from the smallest launch on the river to the finest "greyhound" liner afloat on the seas. To the naval leviathan and the swift torpedo boat the desirability of getting rid of their smoke is equally obvious and important.

#### THE OLD CHURCH-HOUSE, CHELSEA.

THE above sketch shows this house, at present used as a Sunday-school, but which we are told is now so much dilapidated that it has been condemned as unsafe. The Rev. R. H. Davies, the incumbent of Chelsea, proposes to rebuild it, utilising as far as possible the original facing bricks on the exterior, and, in fact, erecting the face of the old building with a substantial backing. It is hoped that some readers of the *Builder* may be able to contribute something towards this praiseworthy attempt to preserve the soul of an old house, while giving it a more substantial and durable body.\*

#### ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS:

##### MEETING IN LIVERPOOL.

THE annual meeting of the Association of Municipal and Sanitary Engineers and Surveyors was opened in the Town Hall, Liverpool, on Thursday in last week, when a large number of the Association's members attended. There were present:—Mr. H. P. Boulnois, City Engineer of Liverpool, and President of the Association; Mr. George F. Deacon, Water Engineer of Liverpool, and Past-President; Colonel Jones, V.C., Wrexham; Messrs. H. T. Wakeham (Garston), T. Marks (Llandudno), T. C. Thorburn (Birkenhead), J. T. Eays (West Bromwich), T. de C. Meade (Hornsey), E. Pritchard, Past-President (Birmingham and Westminster), F. Ashmead (Bristol), Charles Jones (Ealing), Joseph Lobley (Hanley), A. W. Parry (Reading), H. McKie (London), A. T. Davis (Shrewsbury), P. S. Platt (Rochdale), E. G. Mawbey (Leicester), J. Cartwright (Bury), Rhys

\* Subscriptions may be sent to the Rev. R. H. Davies, 178, Oakley-street, Chelsea.

Davies (Brecon, N.W.), J. Haigh (Abergavenny), A. G. M'Beath (Sale), J. Bower (Gateshead), G. E. Eachus (Edmonton), A. R. Window (Liverpool), G. S. Matthews (Dorking), J. P. Norrington (Fulham), N. H. Hopkinson (Kensington), W. H. Savage (East Ham, London), H. Richardson (Oldbury), J. Atkinson (Stockport), W. H. Smith (Carlisle), E. J. Silcock (King's Lynn), W. Spinks (Manchester), J. T. Hawkins (Somerton), R. Brierly (Newton-in-Makerfield), A. E. White (Hull), James Diggle (Heywood), W. Diggle (Kelsall, Chester), Richard Pickering (Whitehaven), H. J. Clarson (Tamworth), T. W. Stainthorpe (Eaton, Middlesbrough), P. Edinger (Frome), F. S. Button (Burnley), J. A. Crowther (Nelson), M. W. Jameson (South Hornsey), J. W. M. Smith (Wrexham), Walter Brooke (Richmond), H. G. Coates (Market Harborough), W. Banks (Rochester), W. Welham (Middletown), J. Parker (Nottingham), A. T. Gledhill (Hecknoldwike), S. E. Thorold (Redditch), E. R. Hooley (North County), R. F. Vallance (Mansfield), A. B. Acworth (Milton-next-Sittingbourne), N. W. Blair (Bootle), R. Thompson (Waterton), F. D. Ward (Liverpool), E. G. Harvey (Ventnor), J. Myatt (Leek), G. E. Shone (Crewe), W. A. Davies (Aston Manor), S. N. Glass (Fulham), Henry F. Marks (Dewsbury), Jesse Clare (Sleaford), G. F. Wike (Sheffield), and John Buchan (Grimsby).

The general meeting of the Association was held in the Council Chamber, and Mr. T. Holder, Deputy-Mayor, in welcoming the members, regretted that the Mayor was absent in London on important business connected with the city. It was a source of gratification to them in that city to know that their respected City Engineer, Mr. Boulnois, was filling the high position of President, and he had great pleasure in asking that gentleman to take the chair.

Mr. T. Cole (Secretary) then read the seventeenth annual report of the Council, from which it appeared that there were now 419, compared with 371 members at the end of the previous year.

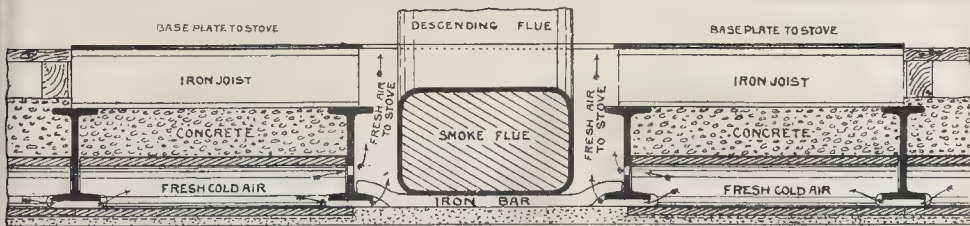
The report having been adopted,

The President said he had much pleasure in presenting to the successful writers premiums which had been voted by the Association for essays on certain subjects. The winner of the first premium of 10*l.* was Mr. E. J. Silcock, King's Lynn, for his essay on "Electric Lighting," and of the second, of 5*l.*, Mr. A. E. White, Hull; these two gentlemen having selected several books as the shape which they wished the premium to assume.

#### The President's Address.

The President, in his annual address, after thanking the members for re-electing him to the presidency of the Association, referred to the benefit which the members derived from attending the district meetings during the year. The inspection of municipal and other works in the various cities and towns could not but enlarge their professional knowledge, which was, without doubt, of the greatest value to the towns where the members were employed, and he thought that, in justice, some arrangements might be made by the corporations and the boards of the towns that the expense falling on their officers should not be entirely defrayed by the officer attending such meetings. A few corporations had already adopted measures whereby the cost did not fall on the officer, grants being allowed towards his expenses in attending meetings of the Association. He referred to the fact that an engineer's profession was one which depended so much upon the knowledge of what others were doing, in order to achieve complete success and avoid failures in his multifarious duties. In all his duties, however, the meetings of the Association instructed the member. The President then entered technically into one or two questions of engineering work, saying that in water engineering the members had had opportunities of visiting some of the largest works in the kingdom, among them that magnificent feat of modern engineering the Vyrnwy dam and artificial lake, which he was proud to say had been carried out by one of their members, Mr. George F. Deacon. Continuing, the President said he believed their proposed registration and the alteration of their title to that of the Incorporated Association of Municipal and County Engineers would give them even a better position than they now held, and would give them a *locus standi* in many new matters. One of their objects was the promotion of the professional interests of the members of the Association.





*Parrett's Floor, with provision for Ventilation, as fixed at the New Buildings for the Children's Hospital, Great Ormond-street.*

on, and in reference to that he would like to say something. Sanitary engineering, as a profession, is only forty years old, and at present no diploma was necessary to distinguish a man fitted to hold the post of chief engineer to a corporation from a man who was not fit. Very often a plumber would put after his name the title "sanitary engineer," thus giving a very misleading notion as to what a sanitary engineer really was. If the one of action pursued by the Association was properly supported, the certificate of competency they granted would be regarded as a diploma under which an individual might be recognised as really a sanitary engineer competent to hold municipal office. He was also of opinion that municipal officers should be entitled to a pension after a certain number of years' service. A system might easily be arranged under which a fair percentage of an officer's salary should be placed in a superannuation fund, which could be increased by the corporation or local board out of the rates. Such a system would go far to cement the good feeling which ought to exist between municipal officers and the corporations or boards they served. Manchester had applied for an Act of Parliament empowering them to form a superannuation fund, and the Corporation of Liverpool, which had at present an incomplete Act, under which it did not appear that any pension could be granted to officers who had joined the service since a certain date, although a percentage of their salaries was stopped for the purpose, would no doubt obtain an Act to change such an anomaly. He was also of opinion that officers should be appointed on a sliding scale. In conclusion, the President said he would do all he could to further the interests of the Association.

We will give some further notes of the meeting in our next.

#### FLOOR SECTION AT CHILDREN'S HOSPITAL, GREAT ORMOND-STREET.

THE accompanying diagram (see above) shows the manner in which Fawcett's fire-proof flooring is being utilised by Mr. C. Barry at the new buildings for the Children's Hospital in Great Ormond-street, as a means of finding space for floors admitting fresh air to the stoves. Mr. Barry proposes to place "Tobin tubes" against internal walls and supply them with air in the same way as the stoves are supplied, through the tubular lintels used in the construction of the fire-proof floors.

#### Illustrations.

##### PAVILION OF CATHERINE DE MEDICIS, BLOIS.\*

THE Pavilion of Catherine de Medicis at Blois forms a detached portion of the chateau known as the Tour de Foix situated at the south-west corner overlooking the river and church of St. Nicholas. Together with the Salle des États and the Tour de Donjon, it forms one of the most ancient parts of the castle, and probably dates from the thirteenth century, although the details of the octagonal turret rather resemble flamboyant work. The illustration is from a drawing by Mr. Herbert Railton.

\* Some description of this pavilion was given in the *Builder* of June 5, 1897, in the report of a paper on the decoration of Blois and Chambord, by the late Mr. Crace.

##### SHEFFIELD MUNICIPAL BUILDINGS DESIGN.

WE publish this week the perspective view and two plans of the design submitted by Mr. H. T. Hare in the second competition, and on which we have already commented in our general article on the designs last week. Mr. Hare wishes to point out that the general idea of the plan was based upon the conviction that the General Offices of the Borough Accountant and Waterworks Department were of too great area in proportion to their height to be satisfactorily lighted by windows only. They were therefore placed in the centre of the building, with top-lights over the greater portion. A direct entrance for the public was provided from Surrey-street, leaving the main entrance and staircase for state purposes only. The plans are so arranged that the business and state portions of the building may be entirely cut off from each other when required.

The following additional notes from his report are furnished to us by Mr. Hare:—

The walls were proposed to be faced with Huddersfield stone on the external elevations, the areas being lined with white glazed bricks. The roofs to be covered with green Westmoreland slates. The turrets and tower-roof to be covered with copper. The whole of the construction, both as regards floors and roofs, to be fireproof on Lindsay's system, with trussed steel joists and punice concrete.

The windows throughout were proposed to be glazed with lead lights in squares, about 6 in. by 9 in., with iron casements when required to open. The windows in the state apartments to have armorial bearings and devices introduced, and to be treated generally in a more ornate manner.

The council-chamber and reception-rooms to be panelled in dark oak and teak to the height of 12 ft. above the floor. The walls in council-chamber to be faced above the panelling with Ancaster stone, and in the reception-rooms to be covered with enriched plaster-work. The floors to be in oak parquetry.

The entrance-hall and staircase to be paved with mosaic. The steps being in Hopton-wood stone, and the walls faced with Ancaster stone. Polished Nopton-wood stone and various marbles were proposed to be used in dados, balustrades, &c.

The ceilings of all the above apartments to be panelled and enriched in plaster.

The large general offices were to be paved with wood-block flooring, and the other offices with pitch-pine 4 in. in width, secret nailed.

The walls in lavatories to be lined with tiles to a height of 6 ft. above the floor, and above finished in plaster for painting.

The whole of the w.c. apparatus throughout were to be on the "Pedestal" system, without enclosing woodwork, and the lavatories of the "tip-up" type.

The heating was to be by hot-air in the State apartments, entrance-hall, and general offices, the air being drawn down to the basement by a 6 ft. diameter fan from a point above the roofs, and heated in chambers placed as nearly as possible under the apartments which they were to warm. Other portions of the building to be heated by hot-water coils placed in the main cases, in the window backs, with fresh-air inlets into the coil-cases.

The extract ventilation was sub-divided into several systems, the upward currents being assisted in all cases by small hot-water coils.

The estimate was 79,950*l.*, but this amount was not, in my opinion, sufficient to carry out the building in an adequate manner."

##### SCULPTURE: "VELASQUEZ."

THIS equestrian statue, by the well-known French sculptor M. Frémiet, was one of the central works in this year's Salon. The object seems to have been to give a portrait statue of the great Spanish painter riding on the heavy type of charger-looking horse, represented in his own pictures, and announced in the voluminous saddle of the period, which would hurry a modern horseman, but which possibly conduced to that extreme gravity and stiffness of

deportment in the saddle which characterises the mounted grandees of Velasquez's paintings.

The figure is characteristic, though the costume certainly does not lend itself well to sculpture, and perhaps we shall not be wrong in concluding that the horse was, after all, the main object of interest with the sculptor.

##### THE PROPOSED "EIFFEL TOWER" FOR LONDON.

WE give this week an illustration of the first premiated design for this proposed 1,200 ft. tower, by Messrs. Stewart, Maclaren, and Dunn.

The design was accompanied by a full and very well-written report going into the whole subject of the design and construction of the tower. From this we have only space to give such extracts as will sufficiently explain the general intention of the designers:—

##### Extracts from Report.

"The dimensions of the tower are 300 ft. across at the base, tapering to 40 ft. across at a height of about 1,100 ft."

A structure rising to so great a height must be artistically independent of its surroundings from all points of view except those in the immediate neighbourhood; but its effect would be greatly enhanced from a closer prospect by a suitable base, and we have suggested on the general drawing a screen wall (which might form the façade of the exhibition or grounds of which the tower will be the centre) of sufficient mass and extent to form a proportionate pedestal. Such an adjunct must, however, remain a suggestion merely, until a site is secured, and the general question of its environment determined.

The style of this screen and the tower itself is of an Eastern character, the authors feeling that to be governed by the strict rules of European art would be a mistake. There is, moreover, something allied to Oriental magnificence in the scale and dimensions of the structure. The freedom in design and the richness in decoration which this style permits make it specially suitable for the purpose.

In designing a structure of this size, enclosed in a steel frame such as this, the nature of the walling must be considered in regard to the expansion and contraction of the frame. Ordinary brick walls would soon show perceptible cracks, and iron frames covered with iron plates, which would expand in the same ratio as the tower, would be found too cold in winter and too warm in summer for comfort.

The special method which we propose is that of forming the outer walls of three thicknesses of plaster on wire netting fixed to iron studding, forming two distinct air spaces. The outer coating would be of cement, rough-cast, of good colour. . . . The elasticity of these walls would meet any expansion or contraction of the tower; their lightness is of great importance, and the speed and economy with which they could be erected is a further recommendation, for the material would be prepared in the workshop and sent up in large slabs, requiring only a few screws and joints for fixing. As the floors would be constructed throughout of concrete and steel, it will be observed that the structure would be, if not fireproof in the strict sense of the word, eminently fire-resisting.

With the exception of the stair not intended for public use, from the fourth stage to the electric light in the lantern, the whole of the steps are arranged in straight flights, round a central well, without winders.

In the two staircases passing up the legs of the tower to the 200 and 275 ft. landings, a revolution of the direction of turning is made, three times in the height; a provision intended to guard against giddiness from turning in one direction. . . . In the construction of these stairs we propose to use Hawksley's patent treads (formed of small cubes of wood set in iron frames) on iron carriages.

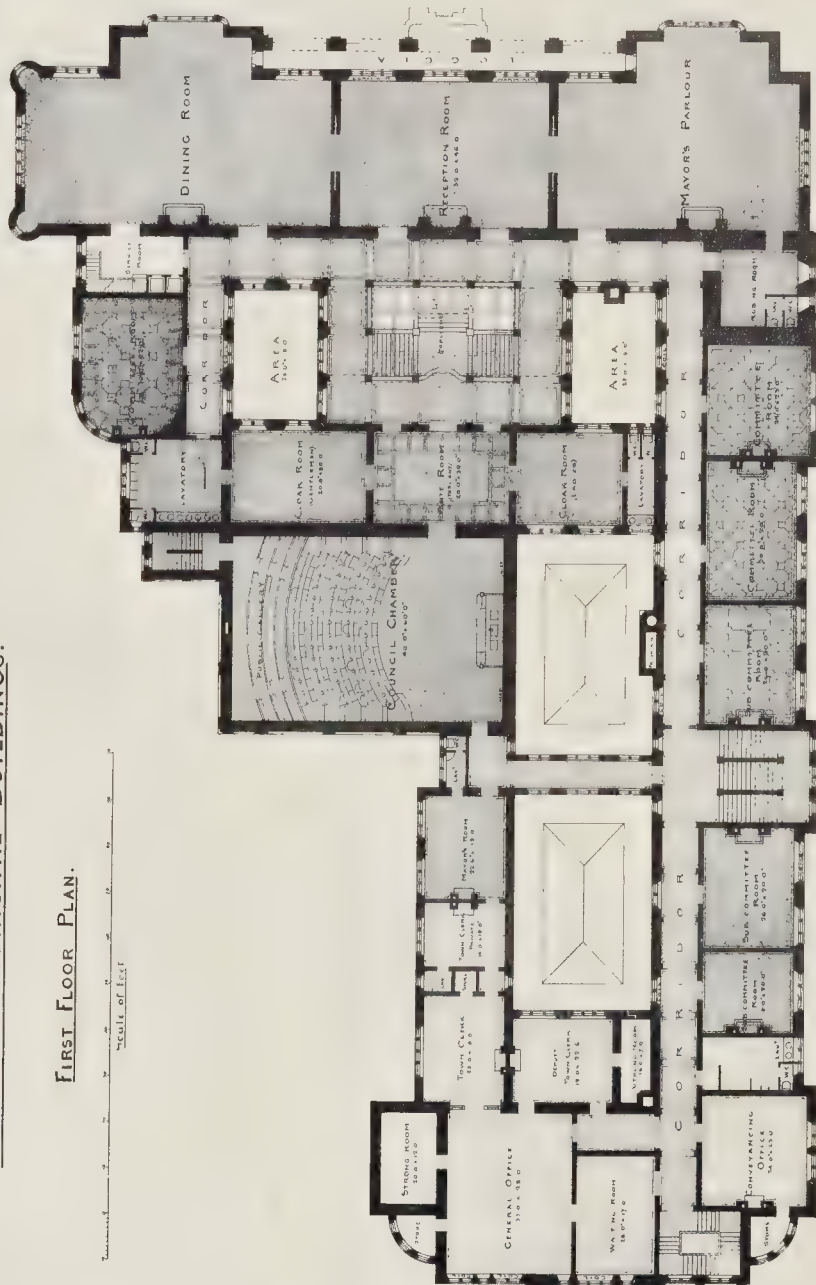
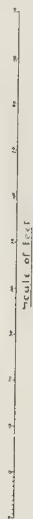
The tower has eight legs from bottom to top, placed so as to form a regular octagon in plan. The whole of the steelwork is to be made in the Siemens-Martin 'open-hearth' system, and is to have an ultimate tensile strength not less than 30 tons, or more than 33 tons per square inch of section, with an elongation of at least 20 per cent. on a length of 8 in. The precautions now usually adopted in



## FINAL COMPETITION.

SHEFFIELD MUNICIPAL BUILDINGS.

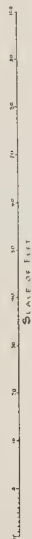
FIRST FLOOR PLAN.





**SHEFFIELD MUNICIPAL BUILDINGS.**

GROUND FLOOR PLAN.



DESIGN SUBMITTED BY MR. H. T. HARE, A.R.I.B.A.



steel structures would be taken here, to ensure that all material was of quality specified.

The lowest or first story extends from the level of the ground to the floor of the central hall. At the base, the diameter of the circle, passing through the centres of the eight legs, is 300 ft., and at the top 300 ft. The inward slope of the legs is thus 1 horizontal to 4 vertical, or the inclination to the horizon towards the centre is 75 deg. 58 min. The most favourable angle to prevent bending stresses on the legs from partial loading, wind, and temperature is fully discussed under the heading of stresses. The legs are in sectional plan 20 ft. square outside, and consist of four massive corners, braced together as shown. The depth of the bracing is 18 in., leaving an inside clear space of 17 ft., and thus ample provision is made to prevent deformation of the square.

By adopting these large dimensions, it becomes unnecessary to brace the legs together.

The maximum shearing stress these legs produce on the masonry is only 2 or 3 per cent. of the weight, and the friction of the steel and masonry would alone be sufficient to prevent sliding.

As an additional security, the steelwork of each leg will be bolted to the concrete or masonry with six bolts, 2½ in. in diameter, carried to a depth of 18 in. These bolts will assist in supporting the legs during construction.

At the base of each leg a ring girder is placed, 5 ft. in depth, resting on a base plate ¼ in. in thickness. The pressure, acting on the corners, will thus be spread over an area of 400 superficial feet of concrete or masonry, giving the moderate direct pressure of about 9 tons per foot.

At the top of the first story, the platform and balcony are supported by a series of ring and radial girders, as shown. These have not only to carry their own weight, the flooring, furniture, and a crowd of people (estimated at a maximum of 1 cwt. per square foot), but also to prevent bending of the legs. For the latter purpose they are made 36 ft. in depth at their junction with the legs, and 18 ft. in the deep at their junction with the legs, and 18 ft. in the centre. Four of the eight legs will be arranged for lifts, and two will have staircases fitted within them. At a height of from 54 to 72 ft. above the base of the second story, a strong ring girder will be erected, 20 ft. wide and 18 ft. in depth, from which the hotel will be suspended by a series of angle-iron ties. This ring girder also forms a support to the roof of the central hall, and gives lateral stiffness to the lower bay of the second story, instead of the ordinary diagonal bracing.

The roof over the central hall is designed to carry the machinery hereinafter described to work the upper lifts, a portion of the lift-cage, wind pressure, its own weight, and a covered way from the centre to each of the legs. From this point for a height of 880 ft. a central lift-cage is provided, to work three independent lifts, and to support a staircase. The lift-cage is 27 ft. 6 in. square, and divided into bays or panels every 17 ft. There are thus nine vertical posts, and the six faces are double braced. Each of the posts and bracings are of such dimensions that they form practically rigid struts, and are capable of bearing wind-pressure, load, and any stress that may be produced by the sudden stoppage of the lifts. The weight of the lift cage is transferred at frequent intervals to the legs of the tower, and the supports are so arranged that they both assist in resisting the lateral action of the wind, and prevent the deformation of the regular octagon.

In the third and fourth story, when the diameter of the tower is less, the form of the section of the legs changes, but is always of ample width, and care has been taken to provide ample ring bracing, both horizontal and diagonal, to prevent deformation and resist the action of storms of wind.

The weight of the various platforms together with the hotel lift-casing, machinery, &c., is supported ultimately by the legs of the octagon.

The tower, above the masonry, as designed, has been estimated to weigh 15,000 tons, which includes an ample margin; it is equally supported by the legs, so that the direct vertical pressure on each at its junction with the masonry is 1,875 tons, the actual pressure in direction of the legs being 1,933 tons.

All the platforms, staircases, public rooms in hotel, &c., are designed to carry 1 cwt. per square foot of area, and the bedrooms in hotel 56 lbs. per square foot.

Careful consideration has been given to partial loading; the total live load provided for amounts to 6,000 tons; and, as will be seen further on, the extreme case of 3,000 tons of live load placed on one side of a vertical plane passing through the axis of the tower, the other side being unloaded, has been considered and provided for.

The tower consists of open lattice work, and a question arises as to the extent of surface on which to calculate the normal wind-pressure of 56 lbs. If the tower were cylindrical or conical and plated all over, that surface would be one half the area seen in elevation, and this would be nearly true for an octagonal cone.

In an open work structure, the wind passing through strikes the concave side with reduced velocity, and the total pressure may be increased beyond that upon a closed surface. Allowing for this, and observing that the structure is more closely braced at the top, we have taken for the

upper 350 ft., 75 per cent. of the area contained between the outer lines of the tower where open, and 50 per cent. where closed in; for the next 300 ft., 65 per cent.; the next 350 ft., 55 per cent. of the open work; and for the lower 200 ft., the area of the surface exposed in each leg in direct elevation multiplied 8 times.

Taking each of these areas so reduced we obtain the following pressures:—

4th or upper stage .....	250 tons.
3rd .....	340 "
2nd .....	440 "
1st .....	390 "
Total .....	1,530 tons.

Multiplying each of these by the respective heights of their centres of pressure above the base of the steel-work of the tower, the overturning moment is 738,300 foot tons; and as the weight without any live load is 14,500 tons the centre of pressure is removed 738,300

= 51 ft., within a base

of 300 ft. 14,500 It would thus require three times 56 lbs. per square foot of pressure to upset the tower, a supporting it were not bolted to the masonry.

The expansion and contraction of a steel bar 300 ft. long is about 1 in. in this country, at extremes of temperature. In the hottest weather, if the tower were free at the base, the radius of a circle passing through the base of the legs of the tower would expand ½ in. But the legs are fixed at their base by friction and bolts to the masonry. A force is thus set up sufficient to draw each leg inwards to the extent of ½ in.

As the top of the legs is practically fixed also, it is necessary to find what force at half the height of the legs, 82 ft., acting horizontally, would bend the legs ½ in.; this can be calculated, and is ascertained to be 27 tons. A bending moment is produced, increasing the stress on one side of a leg and diminishing the other to the extent of ½ ton per inch, and on the bracing, a tension and compression of ½ ton per square inch if the legs were braced together so these forces would be largely increased.

From these calculations, it appears that so far as wind-pressure alone is concerned, the slope of the legs should be somewhat greater; but for its own weight and for partial bending and temperature, a steeper slope would reduce the bending stresses.

An inclination, therefore, of 1 in 4 gives about the best slope under a combination of the actions.

The cost of the tower above the foundations the authors estimate as follows:—

1. Steel-work, 10,573 tons at £27. 10s. ....	£290,757
2. Hotel, landings, &c. ....	26,000
3. Lifts and appliances ....	25,215*
4. Electric lighting ....	8,760
5. Lightning precautions, &c. ....	1,500
Total .....	£352,232

The price of steel-work includes the supplying, planing, drilling, fitting, and erecting of the whole of the steel-work in the tower, and forms the largest part of the cost.

We are confident the work can be done for the price stated, our view as to the cost of the various items in the above estimate having been confirmed by contractors of large experience in the various departments.

#### THE VICTORIA HOTEL, MILFORD-ON-SEA, HANTS.

This building is now approaching completion, it being intended for a residential Hotel at this new seaside resort of Milford-on-Sea, which should not be confounded with Milford Haven, in Wales, as this place is in Hampshire, four miles west of Lymington, and twelve miles east of Bournemouth.

The walls have, to prevent damp, been built "hollow," of local red bricks, relieved with Bath stone dressings, and the roofs are covered with dark Staffordshire tiles.

The accommodation comprises thirty bed-rooms on the first and second floors; and on the ground floor, dining, drawing, coffee and billiard rooms, also private sitting-rooms; and in the basement extensive cellars.

There are also large livery stables attached and a large refreshment-room for day visitors.

The view from the verandah and balconies of the hotel is very fine, there being a long stretch of gorse as a foreground, and at the distance of four miles looking south the picturesque view of the Needle rocks at the west end of the Isle of Wight; to the east, Hengistbury Head, and to the west Hurst Castle and the Solent.

The architect is Mr. W. Charles Evans, of Milford-on-Sea, and London; and the builders are Messrs. Hasleby Bros., Lymington, Hants.

\* Messrs. Archibald Smith & Stevens ask us to state that a complete scheme of lifts was prepared by them in accordance with the requirements of the designers, and embodying some novel features.

#### THE LONDON COUNTY COUNCIL.

The ordinary weekly meeting of this Council was held on Tuesday afternoon, Lord Rosebery in the chair.

The Chairman said a few words expressing regret at the death of Lord Magheramorne, the Chairman of the late Metropolitan Board of Works, and it was agreed to send to the family of the deceased an expression of condolence.

*District Surveyors and their Tenure of Office.*—The adjourned report of the Building Act Committee on this subject was now considered. We gave the full text of the report in the *Builder* for June 21, p. 450, so now only repeat the recommendations of the Committee, viz.,

"1. That no person shall be accepted as a candidate for the appointment of District Surveyor unless he shall have attained twenty-eight years of age, and be under fifty years of age, and that every such candidate shall deliver with his application satisfactory evidence of his age.

"2. That every candidate shall be required to sign a declaration and deliver it with his application that he becomes a candidate, and will accept the appointment if he should be appointed on the following understanding:—(a) That he will personally discharge the duties of his office subject to section 35 of the Metropolitan Building Act, 1855. (b) That he will give his whole time to the duties of his office. (c) That he will not during his continuance in office (except in the discharge of the duties thereof) carry on business as an architect, surveyor, or builder, or directly or indirectly as a partner or otherwise be interested in such business. (d) That he will furnish the Council with information of those cases in his district in which the orders of the Council or the requirements of the Metropolitan Local Management Acts with regard to the width of streets, or to any building, structure, or erection, or projection therein beyond the general line of buildings are not complied with. (e) That he will not claim for compensation in case a diminution of his income shall at any time hereafter arise. (f) That he will keep his District Office open from Monday to Friday (both inclusive) between the hours of 9.30 a.m. and 6 p.m., and on Saturday from 9.30 a.m. to 2 p.m., and give his personal attendance there day from 9.30 a.m. to 11 a.m., and (except Saturday) from 4 to 6 p.m. (g) That he will retire if desired to do so on attaining the age of sixty-five, or at any date subsequent to his attaining that age.

"3. That the aforesaid declaration of the appointed candidate shall on his appointment be entered on the Council's minutes.

"4. That the Districts be re-arranged by the Building Act Committee as opportunities may occur, so that the average of the fees received may in no case amount to less than 500l. per annum.

"5. That the Council reserves to itself the exercise of its powers of disinvestment, if the District Surveyor so appointed should not act consistently with the understanding above set forth in any of the matters referred to therein, or for other sufficient reason.

Councillor Hutton, in moving the reception of the report, recapitulated the reasons advanced thereon (see *Builder* for June 21, p. 450) for the proposed changes, and in support of these reasons quoted some passages from a paper read by Mr. John Slater at the Royal Institute of British Architects a few months ago. Councillor Hutton spoke strongly in deprecation of the system of "devilling" which was usual in connexion with the office of District Surveyor, and contended that such "devilling" was contrary to the Building Act, which he thought clearly contemplated the personal discharge of the duties of the office.

The motion having been adopted, Councillor Atter moved to add at the end of paragraph 1 words excepting from the limits of age therein stated (1) any candidates who had served more than fifteen years in the office of a District Surveyor, or (2) any District Surveyor who sought to be transferred from one District to another.

This amendment was seconded by Councillor Hughes, but was lost on being put. Clause 1 of the Committee's recommendation was then agreed to, and sub-clause c of clause 2.

Councillor E. W. Edis moved the following amendment to sub-clause c of the second recommendation, viz.,

"That during the continuance in office he be prohibited from carrying on the business of an architect, surveyor, or builder, or be not concerned, directly or indirectly, as a partner or otherwise, in a business within his own district."

He said he thought this would meet all the requirements of the case, and deprecated the other changes proposed by the Committee. In support of his contention that the changes were undesirable and inexpedient he read the following letters:—

"London County Council, Spring Gardens, S.W. 1, London, 28th October 28, 1889.

SIR,—The Council has under its consideration the general question of the appointment of District Surveyors, and in particular the question whether they should in future be appointed at a fixed salary, or at a substantial amount, in order that they may devote the whole of their time to the duties of their office and not engage in other business. The present mode of payment of District Surveyors is, as you are aware, by fees, and no restriction exists as to private practice except in their own districts.

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The committee to which the subject has been referred would be obliged if you would favour them with the opinion of your Institute upon these questions, and with any other observations on the subject which may occur to them.

I am desired by the Chairman of the Committee further to mention that the following views appeared to be generally approved by the Committee provided any change is made in the appointment of District Surveyors.

1. The elevation of the office of District Surveyor is desired.

2. The examination at present adopted appears satisfactory.

3. The change in the character of the appointment would probably be made only as vacancies occur.

4. The enlargement of the districts would most likely result.—I am, Sir, your obedient servant,

(Signed) H. DE LA HOOK, Clerk of the Council.

W. H. White, Esq., Secretary.  
Royal Institute of British Architects,  
9, Conduit-street, W.

"The Royal Institute of British Architects.  
No. 9, Conduit-street,  
Banouver-square, London W.

November 13, 1889.

SIR.—We have the honour to inform you that your letter of the 22nd ultimo, on the subject of the appointment of District Surveyors in London, was duly laid before the Council of the Royal Institute of British Architects, and that careful consideration has been given to the points upon which they understand that the London County Council desire from them an expression of opinion.

The conditions under which the District Surveyor is appointed, and the nature of the duties imposed upon him, render it undesirable that he should be paid by a fixed salary, and required to devote his whole time to the office, or be precluded from engaging in private practice, except for buildings within his own district. The interests of the public in this matter are clearly best served by being in charge of a skilful and experienced architect, with the current improvements in building methods and employment of materials, rather than in that of an official who necessarily would have less opportunity of acquiring such knowledge, and who would have no practical experience of the difficulties which arise from time to time—difficulties which are now often solved by the District Surveyor from the results of experience gained in his private practice.

The defects that may now exist would not be ameliorated, nor would the deficiencies of controlling power peculiar to the office, or at present constituted, be removed by any mere variation in the conditions under which the District Surveyor is appointed; and, as you are good enough to state that the Committee of the Council are desirous of receiving further observations on the subject from the Council of the Royal Institute of British Architects, we are to add that, in their opinion, the powers conferred on the District Surveyor by the Metropolitan Building Act and the by-laws made thereunder are insufficient to secure good building, or such compliance with the essential principles of construction and sanitation as is necessary to eradicate evils long the subject of public condemnation.

The Metropolitan Building Act, 1855, which was primarily intended to prevent fire from fire,—to prevent fire communication from one building to another,—does not meet the necessities of the present day; nor does it secure, by the limited authority it gives to the District Surveyor, the erection of well-built, healthy dwellings. In many most important particulars of construction he is absolutely powerless, while in others his authority is so limited that it can hardly be exercised with advantage.

Should the legislature, by extending the scope of the Metropolitan Building Act and other Acts relating to constructions, as well as of other local building Acts, confer more complete powers upon the District Surveyor in London, and other building officers under local authorities, with a view to the thorough control of buildings, the Royal Institute of British Architects would be willing to develop and extend the statutory examinations it now holds, and thus secure an adequate acquaintance on the part of such officers with those details of professional work which are essential to the satisfactory execution of their important duties.

Great and careful attention has been given for many years to the examination of persons desirous of qualifying for candidature as District Surveyors in London, and our Council are gratified to learn from your letter that, in the opinion of the London County Council, the examination, as at present conducted, appears to them satisfactory.—We remain, Sir, your obedient servants,

(Signed) ASTON WEBB, Hon. Secretary,  
WILLIAM H. WHITE, Secretary.  
The Clerk, London County Council."

Councillor Marsland seconded the amendment, which after a long discussion was lost, and the other recommendations were agreed to without discussion.

**The Strand Improvement Bill.**—The Parliamentary Committee presented the following report with reference to the London Streets (Strand Improvement) Bill, 1890:—"This Bill proposed to provide for an important metropolitan improvement in the widening of the Strand between the churches of St. Mary-le-Strand and St. Clement Danes. For that purpose the Bill proposed to carry out the improvement according to the plans and sections shown on the deposited plans, which involved the removal of the houses in the block of buildings between Holywell-street and the Strand and other houses fronting the Strand, and to throw their sites into the public road, making a wide street at this point. The limits of deviation in the deposited plans included the property between Wych-street and the Strand and other property in the neighbour-

hood, and the Bill gave to the Council the usual powers to take the property within the limits of deviation by compulsion. The limits of deviation were not fixed with reference to recompent, but were confined to such extent as was absolutely necessary to carry out the works. The Bill has been passed by the Select Committee of the House of Commons (to which it was referred on March 18 last), consisting of nine members, five nominated by the House and four by the Committee of Selection, and the Committee in reporting to the House made, and were invited to make, no alteration in the clauses relating to the execution of the works, according to the deposited plans and limits of deviation. Those clauses leave the Committee in the same state as submitted by the Council, and with the same modifications proposed by the Council with reference to certain particular large premises comprising printing works having access to the Strand, and the access to the Opera Comique Theatre.

In accordance with the resolutions of the Council the Bill contained two important clauses of principle in reference to the cost of carrying the works into execution.

The first related to the principle which the Royal Commission on the Housing of the Working Classes in 1885, defined as follows:—

"That rates should be levied in a higher measure upon the property which derives a distinct and direct advantage from an improvement, instead of upon the community generally, who have only the advantage of the general amelioration in the health of the district. American legislation has adopted the principle that where public improvements are effected by the local authority, they ought to be able to bring in aid of the cost of the improvement any additional value conferred on the adjoining property by reason of the improvement."

The first principle was recognised in the Chairman's draft report, paragraphs 8 and 9, page xi, but the majority of the Committee expunged these paragraphs, and the betterment provisions have been struck out of the Bill.

Secondly, it was proposed by the 12th section of the Bill to incorporate into this scheme the provisions in Cross's Acts applicable to the purchase of lands for artisans' dwellings, viz.:—

"In settling any question of disputed purchase money or compensation under this Act, the arbitrator, umpire, or jury determining the amount of purchase-money or compensation, shall base the same upon what in their opinion would have been the fair market value of the lands or premises if the improvement had not been contemplated, due regard being had to the nature and condition of the property, and the probable duration of the buildings in their then state, and to the state of repair thereof, and all circumstances affecting such value. But no sum of money shall be awarded for or in respect of any improvement, alteration, or building which in the opinion of the arbitrator, umpire, or jury shall have been made or created with a view to obtaining or increasing compensation under this Act."

On the second principle the Special Committee have modified the clause as to the method of assessing compensation, and settled it as follows:—

"In settling any question of disputed purchase-money or compensation under this Act, the arbitrator, umpire, or jury, determining the amount of purchase-money or compensation, shall not award any sum of money for, or in respect of, any improvement, alteration, or building which, in the opinion of the arbitrator, umpire, or jury, shall have been made or created with a view to obtaining or increasing compensation under this Act."

The Select Committee have made a special report, a copy of which and of the proceedings of the Committee will be forwarded to each member of the Council.

We desire to have the instructions of the Council, as to the further prosecution of the Bill, and we recommend,—

"That the Bill, as reported to the House of Commons be proceeded with."

Councillor Costelloe moved as an amendment:—

"That it be an instruction to the Committee that the Bill be no further proceeded with this Session."

This was seconded by Councillor Leon, and, after a long discussion, was carried, on a division, by 49 to 39, and the Council shortly afterwards adjourned.

**THE "DEVIL" DISINTEGRATOR.**—The Hardy Patent Pick Company, of Sheffield, have, we hear, obtained the first prize for disintegrators in the Royal Agricultural Society's special competition. It is claimed for the "Devil" disintegrator, grinder, and mixer, that it will grind to powder, grate, crush, or shred any material,—animal, vegetable, or mineral,—at one operation. It is capable of grinding cement-clinker, clay, ashes, mortar, paint, glass, broken pottery, &c.

## ARCHAEOLOGICAL SOCIETIES.

**BRITISH ARCHAEOLOGICAL ASSOCIATION.**—The forty-seventh congress will begin at Oxford on Monday next, July 7. The arrangements for holding the meeting have been sadly interfered with by the lamented death of Lord Carnarvon, the elected President for the year, and efforts were made to postpone the gathering. It was found, however, that it was impossible to do so, owing to the issue of tickets, the entering into of contracts, and so forth. The President of the past year, the Earl of Winchelsea and Nottingham, has kindly promised to act again for the meeting and for the ensuing year, and he will read the inaugural address. The proceedings will be opened at 1.30 on Monday at the Town-hall, where the party will be received by the Mayor and Corporation. Afterwards, many of the University buildings will be visited, including the Bodleian Library, and the Ashmolean Museum. Tuesday will be devoted to a further survey of the antiquities of Oxford; Wednesday to visits to Broughton Castle, Bloxham, &c.; and during the week other objects of interest will be inspected in the city and its locality.

**LANCASHIRE AND CHESHIRE ANTIQUARIAN SOCIETY.**—On Saturday afternoon members of the Lancashire and Cheshire Antiquarian Society visited Oldham, and, conducted by Mr. Samuel Andrew, inspected Werneth Old Hall, now the property of Alderman S. R. Platt, and formerly the seat of the lord of the manor of Oldham; Chamber Hall; Cash Gate Cottage, a specimen of the ancient habitation of the "common people"; and Hathershaw Hall, for many generations the home of the Sandifords. Mr. Samuel Andrew read an interesting paper on archaeological Oldham.

**WORCESTER ARCHITECTURAL AND ARCHAEOLOGICAL SOCIETY.**—The first excursion for the season of this society was held on Tuesday in last week, when some of the members and friends took train to Birmingham, and inspected Aston Church and Hall, where descriptive papers were read by Mr. Noake, after which the party proceeded to the Colonnade Hotel for luncheon. On the return journey a halt was made at Kingsorton, where the company inspected the old church, the ancient school-house, and the seventeenth-century parochial library, upon all of which papers were read by Mr. Salt-Brassington, of Moseley.

**SUFFOLK INSTITUTE OF ARCHAEOLOGY.**—Last week the members of the Suffolk Institute of Archaeology and Natural History made an excursion to Dunwich and the neighbourhood between that old town and Saxmundham. Besides Dunwich, they also visited Leiston Abbey, which was described by Mr. W. H. St. John Hope, Theberton Church, and Westleton Church. A long report of the outing appears in the *Suffolk Chronicle* for the 28th of June.

## Books.

*Encyclopédie de l'Architecture et de la Construction.* Directeur, P. PLANAT. Vol. III. 2me fascicule. Paris: Dujardin et Cie.

**GREAT** proportion of the last published part of M. Planat's *Encyclopédie* is occupied by his own article on the very large subject of "Construction," which would make a respectable separate essay in itself. No one who studies the article will regret the length of it; it is probably the most valuable article that has yet appeared in the *Encyclopédie*. M. Planat commences by a little philosophising on the different conditions of art and construction; art undergoes transformations which are not necessarily progress; construction on the other hand is essentially progressive. The different materials used in construction are then briefly classified, and the special form of resistance to external force which they supply. The article then passes into review, historically, the forms of construction among various peoples, accompanied by a large number of illustrative diagrams. Greek construction and Gothic vaulting are very well and fully treated, considering the limits imposed in an encyclopædia even on a large scale; the writer is not, like most of his contributors, ignorant of English work, but supplies various examples from it. Timber roofs are treated of and illustrated at some length. Among the illustrations to the article are two very useful double sheets of small section of various vaulted and domed build-



ings of the world, drawn to scale for the sake of comparison. Iron construction also has full attention and illustration, in proportion to the other branches of the article, but the author sums up with a strongly expressed disapproval of the modern habit (perhaps more prevalent in France than even in England) of falling back on iron ties and supports to get over difficulties of construction.

"Aujourd'hui, la moindre difficulté se présente, on passe un double filet, comme disent les serruriers, on glisse un caisson, on poitrail, une forte poutre. 'Avec le fer cela tient toujours,' dit la sentence moderne; et tout est dit. Cette tendance, chaque jour plus marquée, nous paraît regrettable; avec de pareils procédés, il n'y a plus d'art véritable." The italics are ours; the same thing has often been said in this journal, and we are glad to find M. Planat in accord with us. The whole article is an admirable summary of the subject, with some special points of its own (e.g., the remarks on the statics of the flying buttress), and ought to be put in the catalogue of books for students entering for the preliminary examination of the Institute.

"Cloître," "Colonne," and "Commemoratif," are the other most important articles in the volume; the latter deals with commemorative architecture (monuments) and is illustrated by a number of engravings of various typical forms of monument.

*The Railways of Scotland, their present position; with a glance at their past and a forecast of their future.* By W. M. ACWORTH. London: John Murray. 1890.

MR. ACWORTH'S work on "the Railways of England" has been such a success that it is not surprising that a kind of *encore* to it should be demanded, though it is not very easy to see why the Railways of Scotland should claim a separate treatment as a different problem. The reasons that might be urged are, no doubt, the rather exceptional nature of the ground over which some of them are carried, and the fact that some of them may be regarded rather as holiday lines than railways for ordinary business traffic. However, the book, of much smaller dimensions than its predecessor, is as readable in its way, and contains the same evidence of special acquaintance with the subject. A good deal of the work is occupied with the Forth Bridge and its possible results on northern railway traffic. Mr. Acworth calls attention to the fact that the speed of trains across the Tay Bridge is at present limited to 25 miles an hour, and asks pertinently whether this limitation is to be perpetual, whether a similar limitation will be thought necessary in regard to the Forth Bridge, and if so, whether the gain over the whole journey can be as great as was promised and expected. We have seen no record of the speed at which trains are run over the Forth Bridge, but we should be prepared to find that no reduction of speed would be necessary. The author remarks that in one respect Scotland is in advance of England, two of the leading Companies having begun to experiment on heating their carriages with a less primitive method than the English hot-water tin. One of these is a utilisation of waste heat from the roof-lamps of the carriages, which, by the aid of a small boiler placed over each lamp, and connected with a reservoir beneath the seat of the carriage, sets up a circulating system, the hot water being driven down into the reservoir and the cold rising to supply its place. If the action is really kept up in this way, it is, of course, not on the same system as that of an ordinary hot water circulation, which is actuated by the tendency of heated particles of water to rise above the colder ones. The action of the circulation described must be a purely mechanical one; the hot water boils over and drives the rest before it. But we should rather doubt the efficiency of the system.

Travellers "going North" for the autumn will find a practical interest in the book, or should do so. It is a good book for reading on a Scotch railway; instruction and amusement combined.

*Practical Perspective:* By A. DRAUGHTSMAN. Hammersmith: Ferguson & Co.

THIS "book" consists of three large folded sheets of diagrams, written all over with directions for the learner. One sheet contains a number of small problems; another the lines and setting out for a perspective of a rather elaborately-gabled house, and the third shows

the same house developed into an artistic drawing. It is well done, and as a practical exemplification of the subject it should be of use to beginners. A case should be supplied for the sheets.

*Knight's New Perspective Guide.* By J. P. KNIGHT. London: Simpkin, Marshall, & Co.; Bristol: John Wright & Co.

A SMALL shilling book containing practical diagrams of various problems in perspective, for beginners only. Directions are given on the facing page of each plate. These are very clearly worded; but there are one or two mistakes in principle: about 35 degrees, not 60, is the average angle that can be advantageously included in a perspective drawing; and to use French curves to draw in the various portions of a circle in perspective is very bad advice. French curves, for this kind of purpose at all events, are a delusion and a snare; the curves in them will never entirely fit the case; no good draughtsman would use them for the purpose, and no one will ever become a good draughtsman by using them. The eye and hand can alone supply the delicate gradations required in perspective curves, and must be trained to do so.

## Correspondence.

To the Editor of THE BUILDER.

### THE ARCHITECTURAL ASSOCIATION.

SIR,—I am rather surprised at the articles which have appeared in the *Builder* relative to the suggested alteration in the constitution of the Architectural Association in which certain members are characterised as "the opposition." I think it only fair to those gentlemen who hold the same views as myself to say that, whatever may be our individual opinions as to the scheme suggested by the Education Committee, we are very desirous that no serious alteration shall take place in the objects and working of the Association, without the opportunity being afforded to all members to express their opinion thereon.

After so many years of membership and work in connexion with the Association, during which there has been a gradual increase in the number of members and attendance at the classes, lectures, &c., I claim at least as much interest in its welfare as those who are comparatively young in its service, and naturally I am jealous lest an untimely, and I believe not a popular scheme, should upset or even check its admitted usefulness and success.

If a majority of the members, or I would even say of those under twenty-five years of age (who may be assumed to take the most lively interest in the Association at the present time), should express themselves in favour of the proposed alteration, I would readily accept the decision.

It has always been the pride of the Association that by its constitution it could adapt itself to the requirements of the day, and I can see no reason why the desires of the Education Committee cannot be carried out without any alteration of the rules as is the case with the courses of lectures and classes which have been formed from time to time.

I trust that, although there may be differences of opinion amongst the members, each may give credit to the other for the best motives to promote the welfare of the Association, and earnestly hope that it may continue free from cliques and parties which it has been the work of years to prevent, as "a house divided against itself cannot stand."

July 2, 1890.

J. DOUGLASS MATHEWS.

SIR,—In your editorial note last week, referring to the recent proceedings at the Association, you speak of certain members "who have carried on so determined an opposition to the scheme of the Committee." As a matter of fact, there has been very little opposition at all, and I am afraid that the apparently anything but impartial source from which your reports have been derived, in the absence of your own reporter, has somewhat involved you.

A number of members for some time past have been of opinion that votes on important changes in rules should be taken by means of papers sent to every member. The changes now proposed are very radical and it is highly desirable that they should not be passed by the vote of a mere handful of members at a meeting held in the vacation. Accordingly a proposal was made at the adjourned ordinary meeting on June 13, in a perfectly constitutional manner and after notice had been given to the President, to alter the rule relating to voting,

and it was distinctly stated by the mover of the alteration that it was not intended in any way to express any opinion for or against the new scheme. If the proposal had been accepted by the Committee the papers might have been issued at once for voting on the scheme; but so much opposition was shown, so much odium thrown on those who had signed the requisition in favour of voting by papers (who were told that if their resolution were carried it would result in rescinding everything that had been done, an argument that did not say much for the popularity of the scheme), and so little inclination to reasonably discuss the proposal and come to a speedy decision that the only thing that could be done was to adjourn everything to next session. It is clearly the Committee who are answerable for the delay, not those who want to vote by papers.

W. J. H. LEVERTON.

\* \* We believe the account of the proceedings at the last meeting was correct as to facts. Our opinion as to the mistaken nature of the opposition to a very spirited scheme of progress was formed long before the holding of the last two meetings. Our own reporter was absent from these because it is not usual to report purely domestic matters such as the revision of rules or by-laws of societies. We had previously reported at very considerable length two meetings of the Association at which the points at issue were fully discussed.

### PUBLIC SURVEYORSHIPS.

SIR,—I have noticed lately a prevalent and growing disposition on the part of local authorities, when advertising for a surveyor, to make a compulsory condition that candidates should submit a large number of printed testimonials with their application.

I emphatically protest against this practice, which is most unreasonable, and should be discouraged by all possible means, as it is a serious source of expense to competitors, and debars many from entering the lists.

Only in your last issue a public appointment was verified, the printed matter for which will cost each competitor, say, at the least a guinea, thus showing the entire unreasonableness and heavy expense to which applicants are put, as, of course, only one candidate can be successful.

If printed testimonials are required for the convenience of individual members of authorities, I think the expense should be borne by them, and not by the candidates.

SURVEYOR.

\* \* We have received another letter on the same subject and in the same strain. We fear our correspondent's proposal would only lead to multiplying the number of inefficient candidates in such cases.

### WOODEN "WATER-PIPES."

SIR,—Having noticed what has lately appeared in the *Builder* respecting the above, I am reminded of the same kind of contrivance which was quite common in my native place (a large village in Hert's) sixty years ago; and I should not be surprised if some are still in existence. The principal water-supply was obtained from wells, of which there were a large number, by means of pumps; and with very few exceptions the pipes for these pumps were composed of "elm-trees," with a bore, as near as I can remember, of about 3 in. or 3½ in., and jointed together exactly as shown in the diagram, page 455 of the *Builder* for June 21; the upper section of the trees were roughly hewn square, the upper section shaped to form the framework of the pump.

I have occasionally, when a boy, seen the operation of boring a tree going on in the builder's yard, presumably to replace one that had become decayed. The tool for boring was of the same form and made as an ordinary carpenter's auger, enlarged to the size and length required, and took two or three men to work it, the tree being elevated horizontally upon trestles, and a framework of corresponding height to support the tool, which worked in wood bearings, in a similar manner to machine shafting, to keep it in position.

J. WOOLEY.

DISCOVERIES AT SELBY ABBEY.—The *Leeds Mercury* of June 27 reports that within the past few days two most interesting discoveries have been made in connexion with the restoration of the south wall. The first was the discovery of a part of an old gravestone bearing the date of 1716. "This clearly shows," says the *Mercury*, "that part of the church which was destroyed by the fall of the tower in 1690 was rebuilt towards the end of the last century, and not in 1702, as was generally supposed. The tombstone bears the name 'Merebeck.' The later discovery, however, is still more interesting. Certain foundations have been discovered, indicating the existence on the east side of the south transept of a Norman apsidal chapel extending eastward from the old Norman south transept. The work on this part of the restoration has been suspended for a few days, until Mr. Scott, the architect, is able to inspect the foundations. There are indications of the Norman, the Decorated, the Perpendicular, and modern work in the foundations of the south wall, the present restoration being evidently the fifth that has taken place in that particular portion of the ancient edifice."



## The Student's Column.

HOT-WATER SUPPLY FOR BATHS, LAVATORIES, AND OTHER DOMESTIC AND GENERAL PURPOSES.—I.

## PREFATORY.

**A** SUPPLY of hot water throughout a house is no longer considered a luxury, but merely a common comfort, a necessary, and expected as a matter of course by the majority of tenants of property at as low a rental as 30s.

This subject, however, is, of the various trades called into request in house construction, perhaps one of the most difficult for professional men to obtain reliable information upon, owing to several causes; the chief difficulty being that, as little information has been written or published on this work, knowledge can only be gained by actual experience.

The number of failures that occur in this work is greatly in excess of those in most other trades, by reason of its success or non-success (except in simple every-day jobs) being greatly dependent upon an acquaintance with natural laws, and it is unfortunately obvious that the majority of our mechanics have little knowledge in this direction.

## CIRCULATION.

It is but a comparatively short time ago that an attempt to utilise hot water for heating purposes was made by connecting a pipe or series of single pipes with a boiler, the hot water (from the boiler) being allowed to run into the pipes, and this was found to be a success in a limited way, as the water did not appear to grow cold as might have been anticipated.

The good results obtained were due to the fact that water will circulate in a single pipe, as any one sufficiently interested can quickly determine by experiment, and it will be found that if the pipe be carried in a vertical direction from the boiler there will (supposing heat to be applied) at once set in two distinct movements in the water, that in the centre ascending, and that nearest the surface descending; or if the pipe be carried in a slanting direction the water nearest the top of the pipe will be found travelling from the boiler, and that at the bottom of the pipe towards the boiler.

Possibly when this attempt was first made it was expected that the heat generated in the boiler would be transferred to and along the water in the pipes by conduction, as would be rightly anticipated if heat were applied to one end of a rod of metal; but as water is an extremely poor conductor of heat the result obtained in the transference of heat from the boiler throughout the length of pipe or pipes was soon ascertained to be from another cause, viz., convection, and it is with this property that water possesses that we have to deal, as without it a hot-water circulating apparatus could not exist.

The single pipe system was but short-lived, it being almost immediately ascertained that by providing two pipes and connecting them at the extremity a more rapid and efficient circulation resulted, as it did not necessitate a flow of water in two directions within one pipe, and it is from this early arrangement of two pipes that all our systems of hot-water circulation for heating and for domestic supply purposes have been developed.

Water is composed of two gases which exist in chemical combination ( $H^2O$ ) forming molecules, and water, therefore, consists of a vast number of extremely minute particles, we might say like a heap of sand, but differing from this substance by the fact that the particles have the property of gliding over, under, or around one another (when agitated) practically without the least friction or resistance. Of course water differs from sand also in the fact that we could not have a heap of it, as water, unless confined, instantly distributes itself in all directions; but the comparison is used to make it understood that water is composed of particles or grains (molecules).

When a boiler or vessel is filled with cold water and left undisturbed the particles may be considered to be quite stationary, but immediately heat is applied below the particles nearest the heated surface become warm, and they, like all other substances, are expanded by the heat, and as an expanded particle does not gain in weight as well as size it naturally is made lighter, bulk for bulk, than its fellows.

Immediately, therefore, the particles nearest the heated surface become expanded they are caused to rise by the superior weight of the cold particles surrounding them, and the cold particles that then come in contact with the heated surface become warmed and expanded

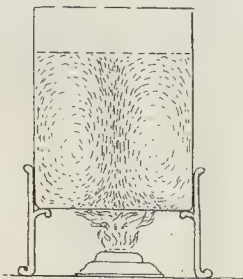


FIG 1

and rise also, and so the action continues; so long as heat is applied a continuous stream of heated particles rising and a continuous stream of colder particles replacing them, and this is the process of convection.

When the fire is applied to a boiler having a system of circulating pipes in connection with it, the heated particles rise to the top of the boiler, and finding an opening (pipe) there, con-

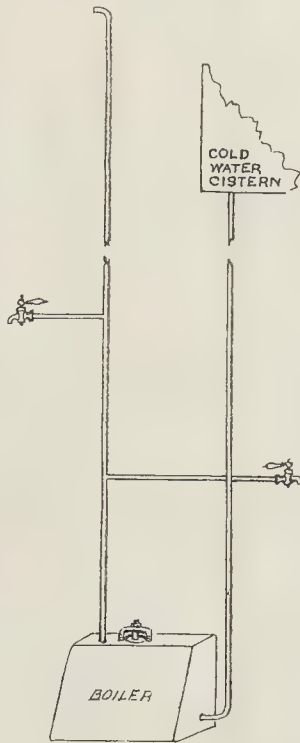


FIG 2

tinue rising up within it until they reach the highest point in the circulating apparatus, above which they cannot rise, and it can be readily understood that for every particle that travels up the flow pipe there must be a corresponding particle come down the return pipe to replace it; the action is the same as in the boiler alone; a stream of heated and lightened particles rising until it is impossible for them to rise further, and a corresponding stream of colder particles travelling downwards to replace

the heated ones, until they come within the heated area, when they are expanded, and at once reverse their direction, and follow their predecessors. This circulation proceeds at a much higher speed than is commonly imagined; when first started the heated particles travel about 12 in. per second, and afterwards, when the water is well heated, at about double this rate.

The earliest description of pipe apparatus to supply hot water for draw-off purposes above the level of the boiler was merely a large boiler in the kitchen range, a pipe from the house cistern down to the boiler, and a pipe from the boiler to above the level of the house cistern (Fig. 2); from this latter pipe the draw-off services were taken, and it will be readily understood that (water always finding its own level) a draw-off service could be connected and hot water obtained at any point below the house cistern.

There were several insurmountable objections to this arrangement; in the first place, a very large boiler was necessary, as no tank could be used, and the largest boiler in an old open range could hardly exceed sixteen gallons capacity, a very insufficient quantity for a store of hot water, as can be judged by the fact that a tank of such small capacity is now never used for even the smallest of hot-water supply purposes. A second objection was that with a long single service-pipe a great quantity of cold water had to be drawn off before hot was obtained, and there were several other objections; but, no doubt, amongst the chief reasons for the discontinuance of this system was the fact that these large boilers were very costly, and as, with the best provision, they were very difficult to clean out, they frequently became fractured, creating no small annoyance and expense, and as soon as it was understood that a smaller boiler and smaller fire (with the addition of a tank) would provide a much more reliable and abundant supply of hot water, the old system naturally fell into disuse.

## SURVEYORSHIPS.

**CHELMSFORD.**—At a meeting of the Chelmsford Town Council, on June 25, the Special Purposes Committee recommended that the resignation of Mr. C. Pertwee, the Borough Surveyor, already mentioned in the *Builder*, be accepted, the resignation to take effect on the day on which the new Surveyor enters upon his duties. According to the *Essex County Chronicle*, they also unanimously recommended the Council to appoint a Surveyor who should devote his whole time to the duties of his office and not be engaged in private practice, and that his salary be fixed at 250*l.* per annum in addition to the salary paid to him by the Joint Sewerage Committee. They also recommended that an office be provided for him. They thought it was highly desirable that the newly-appointed Surveyor should be also the chief sanitary officer of the borough, and that the inspector of nuisances report to him at once all matters requiring attention in respect of which no order from the Council is necessary to authorise immediate action. In reply to Mr. Maskell, the Mayor said that the salary of the Surveyor for the Joint Sewerage Committee was 20*l.* The report was adopted.

**KENT.**—On the 27th ult. a number of the friends of Mr. A. F. Ginn, late Surveyor of Highways and Sanitary Inspector to the Chelmsford Rural Sanitary Authority, met at Chelmsford, to present him with a handsome gold watch, on his leaving the district for an appointment as District Surveyor to the Kent County Council.

## OBITUARY.

**THE EARL OF CARNARVON** died on Saturday last. He was for seven years (till 1885) President of the Society of Antiquaries, and a member of the Historical MSS. Commission in 1882. He had intended to preside over the meeting of the British Archaeological Association at Oxford next week.

**LORD MAGHERAMORNE**, who will be better remembered as Sir James McGarel-Hogg, Chairman for many years of the late Metropolitan Board of Works, died on Sunday last.

**SIR JAMES GOWANS**,—Sir James Gowans, Dean of Guild of Edinburgh, died last week, at the age of 69 years. Sir James Gowans was a son of the late Walter Gowans, of Gowan Bank, Lidlithgowshire, and received his education principally at Hamilton-place Academy, Edinburgh. Sir James was educated for the profession of an architect, but his attention was diverted from that course by the great opening for energy consequent upon the call for workers in the construction of railways. In the capacity of a railway engineer and contractor he was engaged in carrying out some of the most extensive and important railways in Scotland, the most difficult of which to deal with was the 35 miles of the Highland Railway through



mountainous localities. Edinburgh has never had a more able and energetic Deane of Guild than Sir James Gowans. He displayed great firmness in resisting the influences which are brought to bear upon the holder of that office by interested parties, and as Chairman of the Health Committee of the Town Council he was instrumental in carrying out several sanitary improvements in his city. He was knighted in 1886 in connexion with his work in promoting the Edinburgh Exhibition of that year.

SIR WARRINGTON W. SMYTH, F.R.S.—Speaking of the death of Sir Warrington Smyth, F.R.S., the *Mining Journal* says:—Cornwall has lost another thoroughly familiar face by the death of Sir Warrington W. Smyth, so long the chief officer of the Crown Mines in the kingdom. He was one of the last survivors among the younger group of the great band of pioneer geologists and mineralogists who made the name of England famous, combining practice with science in the highest degree.

MR. J. L. RANDALL, Architect to the Shrewsbury School Board, died last week, after a long illness.

MR. W. H. STUBBS, C.E.—The death is announced at Blackpool of Mr. W. H. Stubbs, M.Inst.C.E., formerly Engineer of the North Staffordshire Railway, but recently Chief Engineer of the Manchester, Sheffield, and Lincolnshire Railway Company.

#### GENERAL BUILDING NEWS.

THE CHURCH HOUSE, WESTMINSTER.—At the annual general meeting of the Corporation of the Church House, held last week, a resolution affirming the desirability of immediately commencing the permanent building for the Church House was adopted. The Bishop of London, in seconding the motion, said that the Corporation had already 9,200l. which they could devote to building purposes. They proposed to build the great hall for meetings, and rooms for the Houses of Convocation and the House of Laymen, besides other offices, and therefore they were making a real beginning of the actual working part of the Church House. They needed altogether 35,000l.

MIDLAND RAILWAY GOODS DEPÔTS, BIRMINGHAM.—The new goods depot which is slowly transforming the Suffolk and Severn Street-square from the most disreputable district of Birmingham into the busiest and most commercial (according to the *Birmingham Gazette*) only one of several signs that the Midland Railway Company have determined to reorganise and develop their midland counties traffic. Something like 150,000l. is to be spent in improving the Lawley-street depot; a loop line will almost immediately be constructed between the main, running through King's Heath, and the Suburban, running to King's Norton; and the engineers of the Company are now devising plans for bringing the canal at Worcester Wharf into direct touch with the railway service by means of a huge hydraulic lift, which will be able to carry loaded trucks from the line level to the canal bank, and so render transfer from boat to truck and truck to boat a matter of minutes rather than hours. The basement of the Suffolk-street depot has been nearly completed by the contractor, Mr. Firbank, who will soon, it is said, put a large number of masons to work on the superstructure.

BOROUGH-ROAD POLYTECHNIC INSTITUTE.—The executive of the South London Polytechnic Institutes have obtained possession of the buildings in the Borough-road formerly occupied by the British and Foreign School Society, which will be altered and transformed into the Borough-road Polytechnic Institute. Mr. Rowland Plunbe, the architect appointed to carry out the work at the latter Institute, is now preparing the necessary working drawings.

CHAPTER-HOUSE, ST. MARY'S CATHEDRAL, EDINBURGH.—A provision was made by the late Mr. Hugh J. Rollo, Writer to the Signet, in his settlement for the completion of the Chapter-House of St. Mary's Cathedral, Edinburgh, and Mr. J. Oldrid Scott has been preparing plans for it. The building is to be square on plan, but with an octagonal upper stage, and will have a groined vaulting springing from a central pier of polished granite. The cost of the work will be about 5,000l. Messrs. Morgan & Sons, of Glasgow, are the builders.

CAMDEN PARK ESTATE, CHISLEHURST.—We are informed that Camden-place and Park, Chislehurst, the late residence of the Empress Eugénie, has been purchased by W. Willett, Builder, of London and Brighton, who proposes to develop it as a building estate.

PROPOSED NEW POST OFFICE FOR LIVERPOOL.—On Thursday in last week a deputation, comprising the Mayor of Liverpool, several local members of Parliament, and members of the City Council, waited upon the Postmaster-General to lay before him the inadequacy of the present accommodation at the Liverpool General Post Office, and to urge that steps should be taken to acquire a site in Victoria-street. Mr. Baikes, the Postmaster-General, said a site had been offered in Lime-street, but he promised to consider the views of the deputation.

THE CHAPTER-HOUSE, DURHAM CATHEDRAL.—Dr. Lake, Dean of Durham, appeals for funds for the complete restoration of the Chapter-house of the Cathedral of Durham, as a memorial to the late Bishop Lightfoot.

THE PRIORY CHURCH, LEOMINSTER.—The western tower of the grand Priory Church at Leominster, which has been in a dangerous condition for some considerable time, is to be repaired at once. The architects, Messrs. Kempton & Fowler, of Leamington, have in their work a most important and responsible commission, for the construction, as described in their elaborate report to the Committee, is of a most unusual character, and the dilapidations are of long standing.

PUBLIC BUILDINGS FOR SOUTH STOCKTON.—At a special meeting of the South Stockton Local Board, held on the 25th ult., the Board accepted the tender of Mr. W. C. Atkinson, of Stockton, for the erection of new Public Offices for the Board, at the sum of 3,377l. Mr. J. M. Garry, of West Hartlepool, is the architect.

CHURCH OF ST. PAUL, LONGRIDGE.—The new Church of St. Paul, Longridge, near Preston, was opened on Thursday last. The church has been built at a cost of over 5,000l. from the designs of Mr. Ewan Christian, architect to the Ecclesiastical Commissioners.

ROYAL HOTEL, CARDIFF.—It has been resolved to considerably enlarge this hotel, from plans prepared by Mr. J. P. Jones, architect, Cardiff. The contract for the ironwork has been let to Mr. Archibald D. Davany, of London. The work is estimated to cost 25,000l., of which 19,470l. is the amount of the builder's contract, the builders being Messrs. C. Sheppard & Son, of Cardiff. The carving will be executed by Mr. Wormleighton, of Cardiff. Messrs. J. & H. Patteson, of Oxford and Manchester.

BOARD SCHOOLS, BARKING.—At a recent meeting of the Barking School Board the General Management Committee reported that Mr. C. J. Dawood had presented preliminary designs for the new board schools. The committee recommended that schools be erected to provide for an additional 350 children, making in all 1,350. The report was adopted, and the architect was requested to prepare the necessary plans for the Education Department.

ST. BRIAN'S CHAPEL, DUKINFIELD.—The Old Chapel congregation (Unitarian), Dukinfield, having just celebrated their jubilee year, have determined to memorialise the event by spending the sum of 2,000l. on internal and external improvements. A new west end will be added to the chapel in order to complete the original design.

NEW SPACIOUS, &c., BUXTON, DERBYSHIRE.—At the fortnightly meeting of the Buxton Local Board, on the 27th ult., Mr. G. F. Barnard reported the result of the interview with Mr. G. Drewry, the Duke of Devonshire's agent, as to the erection of a new Spa-room, the providing of a canteen, and the opening-out of a new road from Dale-terrace, in Higher Buxton, to Ashwood Dale. The Spa-room question, the Chairman said, was settled at once as far as Mr. Drewry was concerned. Plans were now in the hands of Mr. Curry, the Duke's architectural adviser, and, if he was satisfied as to the site, the question would no doubt be settled.

PRESBYTERIAN CHURCH, WIMBORNE.—The memorial stone of this new church was laid on June 21 by Mr. Samuel Smith, M.P. The cost of the building will be 5,000l.

BEESLEY CHURCH, LINCOLNSHIRE.—The parish of the village of Beesley, situate on the north wolds of the County of Lincoln, has just had its church restored, and the opening services took place on the 1st inst., the Lord Bishop of the Diocese preaching on the occasion. The church consists of nave, chancel, vestry on the south side, and south porch; the old nave arcades, of three arches on each side, and of early character, have been rebuilt, and form a good feature internally. Some old fragments of fourteenth century character found in the walls induced the architect to adopt the style of that period for his work, and these have been rebuilt in the walls; the roofs are of the interlaced type, of solid construction, boarded, and left unstained; the fittings are of deal, and varnished; the old seventeenth century pulpit has been retained and restored; the old tower arch is again doing duty, and has a three-light window over it, the west gable being finished with a well-designed bell gable with spire terminal. The old west tower of Norman work was found buried under a mound of earth 6 ft. high, and on the removal of this the two lower courses were found in good condition; the tower had evidently been burned down. The architect is Mr. James Fowler, of Louth, and the work has been done by Mr. C. Baines, of Newark, and Mr. West, of Beesley. The east window, of three lights, with fine flowing tracery, has been filled with stained glass representing the Ascension.

SOCIETY OF ARTS.—The annual conversations of the Society of Arts was held on the 27th ult., at the Natural History Museum, South Kensington. There was a very large attendance, the number of guests being estimated at between three and four thousand. They were received in the Great Hall by the Duke and Duchess of Abercorn, the Duke being the Chairman of the Council of the Society. While mentioning the Society of Arts, we may note that on Monday last, at Windsor, the Queen conferred the honour of knighthood upon the Secretary, Mr. (now Sir) H. Trueman Wood.

#### SANITARY AND ENGINEERING NEWS.

WATER SUPPLY IN SOUTH-WEST DURHAM.—On June 25, at the Barnaby Castle Police-court, three men were prosecuted for trespass on the Lynessack Farm, in the South-West Durham colliery district. The defence was that the defendants were absolutely compelled to trespass in search of water, as a positive famine existed. A fine was inflicted in each case.—Subsequently at a meeting of the Teesdale Rural Sanitary Board, Mr. Shipley, the manager of the Woodland Colliery Company, said that the colliers were drinking water from hedge-drains and ditches, and the workmen would not live in the district owing to the dearth of water. Mr. W. T. South said the colliery companies had tapped the whole of the springs in their workings, and the question was, who should be called upon for restitution. Mr. Robinson, C.E., produced plans for the extensive Cockfield district water supply, which were approved. The estimated cost was 3,492l.; and it was resolved to apply for the sanction of the Local Government Board to borrow 4,000l. to carry out the scheme.

DEFECTS IN DRAINAGE OF SUNDERLAND HOUSES.—At the last meeting of the Health Committee of the Sunderland Town Council, Mr. Frank Caws, architect, presented a paper on the leakage from soil-pipes into the foundations of houses instead of into the sewer. He stated that he had discovered the defect in two or three houses, and he was afraid that it existed in a great many. Diagrams were produced, and Mr. Caws explained a plan of a house, which he overcame in 1887-7, to be *Builder* for June 14, p. 437. The Chairman, in conveying the thanks of the Committee to Mr. Caws, expressed a hope that the members of the Health Committee who were also members of the Building Committee would endeavour to carry out the ideas suggested by Mr. Caws.

#### STAINED GLASS AND DECORATION.

ST. SERIO'S CHURCH, PENMAENMAWR.—A two-light memorial window has just been erected in St. Serio's Church, Penmaenmawr. The subject represented is the Nativity. The work has been designed and executed by Messrs. Mayer & Co.

CLIFTON COLLEGE CHAPEL has recently been enriched with mosaic. The mosaic pavement in the richly decorated mosaic pavement in the apse is decorative, and contains one figure only, that of the sower going forth to sow his seed. This mosaic is of marble, and was made and laid down by Italian workmen. The mosaic picture above the communion-table is from a painting by Mr. W. Holman Hunt, which he overcame in 1887-7, to be reproduced in this manner for the College Chapel. The work has been produced in England by English workmen in the employ of Messrs. Powell, of Whitfriars. The mosaic picture and reredos are the gift of the Head-Master.

THE DEAN BURTON MEMORIAL WINDOW, OXFORD.—The subject of this window, which it is proposed to erect in St. Mary-the-Virgin Church, and which has been designed by Mr. C. E. Kempe, M.A., is, according to the *Oxford Journal*, a "Jesse Tree." At the base of the window, which is a good deal obscured by the west gallery, are shown the heraldry of the twenty-one existing colleges, supported by angels; above this in the centre Jesse reclines, with two of the Judah kings on each side, and the four Evangelists writing their Gospels. The design came before the Hebdomadal Council on Monday week, and was approved.

#### FOREIGN AND COLONIAL.

STUTTGART.—It has been decided to erect a group of buildings, comprising an infirmary, poor-house, and workhouse, on an extensive site outside the northern suburb of the town. In the infirmary, room for some 350 inmates will be found; the poor-house will have accommodation for 100 families and 150 single persons; and the workhouse will have, besides its ordinary wards for 130 inmates, a night ward with 110 beds. A competition, open to German architects only, has been arranged by the Corporation, and the programme shows that three premiums, of a total value of some 500l. will be given away.

BERLIN.—Some time ago the report circulated in the local papers that the Emperor had expressed his intention of seeing the old St. Mary's Church (situated at no great distance from his palace) surmounted by a dignified tower. We now hear that the Architect, Yarin, in his own accord has opened a competition to its members for designs for such a spire. The spire is to be of brick, and about 250 ft. in height.—The annual election at the German "Academy" (Academy der Kuenste, Berlin) shows that Professor Karl Becker, who has held the post of president since 1880, will remain in office, and that the eminent architect, Professor Ende, will be the vice-president of the year. Karl Becker will attain his seventieth year next December, and the forty fourth consecutive one of his residence in the capital. Professor Ende (hon. cor. member to the R.I.B.A.) has been able to again take up his usual lecture at the Royal Technical College this term, after having taken a year's leave of absence on account of ill-health.



Evidence having been given on both sides, at the close of the case.



His Lordship summed up, saying that the case was one which ought never to have been brought before a jury, but ought to have been referred.

The jury found that 18l. was sufficient.

His Lordship thereupon gave judgment for the defendant, with costs.

#### CLIFFE V. THE RURAL SANITARY AUTHORITY OF POTTERSPURY.—SAME V. THE DUKE OF GRAFTON.

These cases were heard together, in the Queen's Bench Division, before Mr. Justice Denman, without a jury. They had occupied the attention of his Lordship on several previous occasions. He now gave judgment.

The circumstances were shortly these. The village of Pottersbury is on the borders of Northamptonshire, and is mostly belonged to the Duke of Grafton, but the plaintiff owned a water-mill and some cottages there. Previous to 1883 the drainage was imperfect; in that year typhoid fever broke out, and amongst those who died of the disease was the then Duke of Grafton. The present Duke thereupon constructed a system of drainage for that place, the outfall being into the stream that supplied the plaintiff's mill. The Local Sanitary Authority took over this system of drainage, but since then other works have been constructed, which, it was said, carried the drainage free of the stream.

The plaintiff now sued for damages upon the ground that his stream had been fouled and his mill-pond filled up, and he asked for an injunction to prevent these things occurring in the future. In the course of the case it was said that the plaintiff would be content if his mill-pond were cleared out at a cost of some 125l.

Mr. Justice Denman went through the circumstances which had been proved in evidence before him, and said that under all the circumstances he was of opinion that the plaintiff had failed to make out a case against either the Sanitary Authority or the Duke.

Judgment for the defendants with costs, but execution was stayed with a view to an appeal.

#### MEETINGS.

##### MONDAY, JULY 7.

Royal Institution.—General Monthly Meeting. 5 p.m. Clerks of Works' Association (Carpenters' Hall).—Mr. T. Edmond on "Lighthouses." 8 p.m.

##### TUESDAY, JULY 8.

Royal Institute of British Architects.—The President's Conversations at the Natural History Museum. Cromwell-road. 9 p.m.

Royal Society of Antiquaries of Ireland.—Meeting at Athlone.

##### WEDNESDAY, JULY 9.

Liverpool Engineering Society.—Excursion to the Manchester Ship Canal Works.

#### RECENT PATENTS.

##### ABSTRACTS OF SPECIFICATIONS.

9,907.—*Bolts for Double Doors*: J. Upton.—The fastening, which is the subject of this patent, holds one of the doors in a close and rigid position whenever the other door is closed. It is actuated by a spring catch moved by the pressure of the second door when closed. Other mechanical arrangements are included for operating the fastening at a distance from the doors when required.

10,552.—*Lathe Attachment for Shaping Wood*: G. Fritz.—To form ruled patterns, gear wheels, &c. Typically-shaped cutters are carried on a spindle moved by the same motor that actuates the lathe.

12,202.—*Compound for Paints*: R. Condy.—Sulphate of lead, when introduced in a pigment, is so treated by this inventor that, when ground in oil, it possesses the property of quickly drying and having a good body. Oxide of lead is added, preferably the hydrated oxide of lead, the method for precipitating which is described.

13,223.—*Painters' Brushes*: J. Oates.—On the head of the brush, which is the subject of this patent, is formed a hook or fringe projecting from one side of the brush, so that when the brush is placed in a can of water or oil, this hook or fringe engages with the upper edge of the can, and is supported thereby in the liquid without the lower points of the bristles touching the bottom of the can. The bristles are thus kept clear of any sediment lodging at the bottom of the oil-vessel, and the handles do not become daubed with paint or varnish.

20,554.—*Chimney-pots*: J. Jones.—This invention consists of a cylindrical zinc pot, which has flanges or collars fixed on the outer side, to prevent the pots from current of air passing up or reaching the top of the pot. In the inside of the pot is an extra space (formed by the outer flanges or collars) to exhaust any tendency to a downward current of air.

1,665.—*Preventing Wood Fungus*: J. H. Timm, Germany.—According to this specification, the growth of wood fungus resulting from the material, clay, earth, &c., used for filling up the space between the beams and the boards, is prevented by covering the surfaces with incombustible or impregnated carbonaceous materials—so as to completely insulate the beams and boards from the filling material.

##### NEW APPLICATIONS FOR PATENTS.

June 15.—9,268, H. Fourness, Promoting Ventilation and Preventing Down-Drainage.—9,277, E. Brighton, Sash-fasteners for Windows.—9,305, C. Thode, Door-springs.—9,306, C. Howe, Testing the Setting Properties of Cements and Plasters.—9,321, Don De la Salla, Joinery.

June 17.—9,238, W. Fairweather, Roofing or Sheathing Tiles.—9,316, H. Holland and W. Carter, Sash-fasteners.—9,312, C. Rogers, Wood Screws.—9,334, D. Close, Bricks.

June 18.—9,406, J. Kaye, Bolts for Doors, &c.—9,422, W. Lester, Glazing-bars or Astragals.—9,440 and 9,441,

H. Schlund, Hinges.—9,485, A. Moore and H. Petta, Street Metal Roofing.

June 19.—9,489, J. A. Duckett, Water-closets.—9,524, C. Walton, Belts, and The Machinery.—9,536, H. Lake, Metallic Lathing.

June 20.—9,562, R. Holden, Joiners' Tool.—9,564, W. Thompson, Saws.—9,563, W. Edleston, Fasteners for Windows.

June 21.—9,613, J. Bloomfield, Enamelled Bricks, &c.—9,637, B. Edwards, Roofing Tiles or Slates.

##### PROVISIONAL SPECIFICATIONS ACCEPTED.

6,783, F. Iyverman, Securing Window Fastenings.—7,079, J. Mason, Door Spring and Check.—7,183, W. Stock, Syphon Cisterns.—7,194, C. Edwards, Drain-pipes, &c.—7,365, C. Bonne, Clamp.—7,468, W. Wilford, Flushing Apparatus for Water-closets.—7,707, D. Bostel, Flushing Water-closets.—7,743, J. Green, Water-waste Preventers for Cisterns, &c.—8,668, B. Piffard, Varnishes.

##### COMPLETE SPECIFICATIONS ACCEPTED.

##### Open to Opposition for Two Months.

12,659, J. Bristow, Repairing Slated Roofs.—13,046, W. Bramwell, Chimney Tops.—3,560, R. F. Ambrose, Window Sashes and Frames and other articles hung by weights.—6,174, W. Thompson, Doorknobs and Fixing same to Spindles.

#### SOME RECENT SALES OF PROPERTY:

##### ESTATE EXCHANGE REPORT.

JUNE 10.—By Messrs. Cobb (at Maidstone): "Wood Farm," Boughton Malherbe, Kent, 37a, 2r. 4p., 1. 54l.

JUNE 20.—By Messrs. Cobb (at Sittingbourne): a plot of 1. land, near to Sheerness, 4a. 3r. 11p., 690l.; 1. marsh land, 54a. 3r. 13p., 1,510l.; enclosures of 1. marsh land, 82a. 1r. 32p., 2,000l.

JUNE 23.—By Fuller & Fuller: 1. ar. of 150l., Peckham, 2r. 21a. 10p., 57. 3r. 5p., 690l.; 1. ar. of 150l., Peckham, 2r. 21a. 10p., 57. 3r. 5p., 690l.; 1. ar. of 150l., Peckham, 2r. 21a. 10p., 57. 3r. 5p., 690l.

JUNE 24.—By Messrs. Cobb (at Rochester): F. G. of 6l., Chatham Hill, with reversion in 13 yrs., to 92l. 6s. p.a.; a plot of 1. fruit land, Gillingham, 2a. 1r. 13p., 1,450l.; a part of "Crown Farm," 53a. 2r. 2p., 2,500l.

JUNE 25.—By Messrs. Cobb (at Rochester): F. G. of 6l., Hoath Wood, 2a. 0r. 14p., 1,700l.; F. G. of 6l., E. H. Lunley, 15l.; Duke-st., St. James's, 1r. 140l. p.a., 3,700l.; By Chester and Sons, 1 and 4, St. Mary's, 1r. 22l. 10s., 1,130l.

JUNE 26.—By Messrs. Cobb (at Rochester): F. G. of 6l., 9 to 10, St. Mary's, 1r. 40l. p.a., 22l. 10s., 1,060l.; 1,200l.; 35, Blomfield-st., 1r. 32l. 10s., 2r. 34l., 600l.; 440l.—By D. Smith, Son & Oakley: "The Old Red Lion," 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.; 101, 103 & 105, High-st., 1r. 69l. 12s., 1,235l.

JUNE 27.—By Messrs. Cobb (at Rochester): F. G. of 6l., 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.; 101, 103 & 105, High-st., 1r. 69l. 12s., 1,235l.; 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.

JUNE 28.—By Messrs. Cobb (at Rochester): F. G. of 6l., 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.; 101, 103 & 105, High-st., 1r. 69l. 12s., 1,235l.; 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.

JUNE 29.—By Messrs. Cobb (at Rochester): F. G. of 6l., 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.; 101, 103 & 105, High-st., 1r. 69l. 12s., 1,235l.; 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.

JUNE 30.—By Messrs. Cobb (at Rochester): F. G. of 6l., 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.; 101, 103 & 105, High-st., 1r. 69l. 12s., 1,235l.; 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.

JUNE 31.—By Messrs. Cobb (at Rochester): F. G. of 6l., 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.; 101, 103 & 105, High-st., 1r. 69l. 12s., 1,235l.; 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.

JUNE 32.—By Messrs. Cobb (at Rochester): F. G. of 6l., 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.; 101, 103 & 105, High-st., 1r. 69l. 12s., 1,235l.; 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.

JUNE 33.—By Messrs. Cobb (at Rochester): F. G. of 6l., 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.; 101, 103 & 105, High-st., 1r. 69l. 12s., 1,235l.; 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.

JUNE 34.—By Messrs. Cobb (at Rochester): F. G. of 6l., 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.; 101, 103 & 105, High-st., 1r. 69l. 12s., 1,235l.; 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.

JUNE 35.—By Messrs. Cobb (at Rochester): F. G. of 6l., 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.; 101, 103 & 105, High-st., 1r. 69l. 12s., 1,235l.; 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.

JUNE 36.—By Messrs. Cobb (at Rochester): F. G. of 6l., 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.; 101, 103 & 105, High-st., 1r. 69l. 12s., 1,235l.; 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.

JUNE 37.—By Messrs. Cobb (at Rochester): F. G. of 6l., 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.; 101, 103 & 105, High-st., 1r. 69l. 12s., 1,235l.; 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.

JUNE 38.—By Messrs. Cobb (at Rochester): F. G. of 6l., 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.; 101, 103 & 105, High-st., 1r. 69l. 12s., 1,235l.; 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.

JUNE 39.—By Messrs. Cobb (at Rochester): F. G. of 6l., 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.; 101, 103 & 105, High-st., 1r. 69l. 12s., 1,235l.; 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.

JUNE 40.—By Messrs. Cobb (at Rochester): F. G. of 6l., 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.; 101, 103 & 105, High-st., 1r. 69l. 12s., 1,235l.; 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.

JUNE 41.—By Messrs. Cobb (at Rochester): F. G. of 6l., 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.; 101, 103 & 105, High-st., 1r. 69l. 12s., 1,235l.; 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.

JUNE 42.—By Messrs. Cobb (at Rochester): F. G. of 6l., 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.; 101, 103 & 105, High-st., 1r. 69l. 12s., 1,235l.; 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.

JUNE 43.—By Messrs. Cobb (at Rochester): F. G. of 6l., 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.; 101, 103 & 105, High-st., 1r. 69l. 12s., 1,235l.; 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.

JUNE 44.—By Messrs. Cobb (at Rochester): F. G. of 6l., 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.; 101, 103 & 105, High-st., 1r. 69l. 12s., 1,235l.; 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.

JUNE 45.—By Messrs. Cobb (at Rochester): F. G. of 6l., 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.; 101, 103 & 105, High-st., 1r. 69l. 12s., 1,235l.; 11l. 10s., 1r. 10s., 2r. 16p., 1. and c. 55l. 12s., 2,800l.

cial-rod, u. 7 yrs., p. 8l. r. 31l. 4s., 32l.—By Newbon & Harding: 89 to 95 (odd), Caledonian-rd., 1r. 10s., u. 33 yrs., p. 20l. r. 107l. 10s., 2,020l.; "The Talbot," 1. 3 & 5, Whitford-ld., u. 33 yrs., p. 16l. r. 90l., 2,600l.; 1. 3 & 5, Whitford-ld., u. 33 yrs., p. 16l. r. 90l., 2,600l.; 1. 3 & 5, Whitford-ld., u. 33 yrs., p. 16l. r. 90l., 2,600l.

32 and 34, Balcombe-st., Dorset-sq., u. 31 yrs., 1,163l.; 1,120l., 1,130l., Church-pl., Paddington, 1. r. of 100l., u. 42 yrs., p. 17l. 10s., 355l.; 4, 7, and 8, Railway-pl., u. 42 yrs., p. 17l. 10s., 355l.; 4, 7, and 8, Railway-pl., u. 42 yrs., p. 17l. 10s., 355l.

Arlington-rd., Camden-town, u. 21 yrs., p. 4l. 10s., 385l., 185l., By P. Matthews: 26, Church-rd., Hoxton, u. 21 yrs., p. 4l. 10s., 385l., 185l., By P. Matthews: 26, Church-rd., Hoxton, u. 21 yrs., p. 4l. 10s., 385l., 185l.

Wanted, 1r. 64l. p.a., 300l. By Farsborough, Ellis & Co.: 1. r. of 6l. 10s., Dulwich, with reversion in 76 yrs., 160l.; 1. r. of 37l., with reversion in 82 yrs., 925l.; 1. r. of 37l., with reversion in 80 yrs., 635l.; 1. r. of 37l., with reversion in 80 yrs., 1,700l.

Watney & Sons: 1. r. of 30l. p.a., Chamberwell, with reversion in 70 yrs., 735l.; 1. r. of 30l. p.a., with reversion in 70 yrs., 115l.; 1. r. of 30l. p.a., with reversion in 70 yrs., 955l.

Greenwich, f. area 5,600 ft., 450l.; 37 and 38, Barmston-rd., Catford, u. 21 yrs., p. 15l., 300l.; 23, 25, and 27, Gill-st., Limehouse, u. 14 yrs., p. 10l. 7s., r. 83l. 4s., 130l.; By Ireland & Barclay: 4, Charles-st., Lion-grove, u. 70 yrs., p. 8l. 8s., 185l.; By Debenham, Tewson, & Co.: No. 103, Lambert-rd., 1r., 52l. p.a., 770l.; By Frother & Co.: 1. r. of 30l. p.a., 1,000l.; 1. r. of 30l. p.a., 1,000l.

wood-rd., Leytonstone, 1r., 450l., 700l.; The f. house "Wellsville," Bulwer-rd., 1r., 450l., 700l.; By E. Smith & Co.: The Residence, Elmfield, Harrow, and 1a. 3p., u. 42 yrs., p. 17l. 10s., 355l.; 4, 7, and 8, Railway-pl., u. 42 yrs., p. 17l. 10s., 355l.

"Strathfield," Elm-rd., Clapham, u. 30 yrs., p. 8l., 480l.; 15, 20, and 22, Walmer-st., Marylebone, u. 42 yrs., p. 17l. 10s., 355l.; 4, 7, and 8, Railway-pl., u. 42 yrs., p. 17l. 10s., 355l.

Walworth, 1r., 1. 32l., 805l.; 3 and 4, Queen-s-row, 1. 32l., 805l.; 3 and 4, Queen-s-row, 1. 32l., 805l.

Conduits used in these lists.—F. G. for freehold ground-rent; 1. r. for leasehold ground-rent; 1. r. for improved ground-rent; 1. r. for ground-rent; 1. r. for freehold; c. for copyhold; 1. for leasehold; 1. for estimated rental; u. for unexpired term; p. a. for per annum; f. for foot-cube; 1. for 100 sq. rd. for road; sq. for square; pl. for place; ter. for terrace; crea. for crescent; yd. for yard, &c.]

#### PRICES CURRENT OF MATERIALS.

TIMBER.		£.	s.	d.	£.	s.	d.
Greenheart, B.G.	.....	ton	6	10	0	7	10
Teak, E.I.	.....	load	11	0	0	14	0
Sequoia, U.S.	.....	foot cube	0	2	8	0	3
Asch, Canada	.....	load	8	0	0	3	10
Birch	.....	load	3	0	0	5	0
White Pine	.....	load	3	10	0	4	15
Red Pine	.....	load	1	15	0	3	10
Oak	.....	load	2	10	0	4	10
White Pine	.....	load	5	10	0	10	0
Yellow Pine	.....	load	5	10	0	10	0
Lath, Baltic	.....	fathom	5	0	0	6	0
St. Petersburg	.....	load	5	0	0	6	0
Wainscot, Riga, &c.	.....	log	0	0	0	7	0
Deals, Finland, 2nd and 1st. std.	.....	load	7	15	0	10	0
100	.....	load	7	15	0	10	0
Riga	.....	load	6	0	0	8	10
St. Petersburg, 1st yellow	.....	load	9	10	0	14	10
" white	.....	load	7	0	0	10	0
Swedish	.....	load	7	0	0	15	0
White Pine	.....	load	8	0	0	17	0
Canada, Pine, 1st	.....	load	12	0	0	17	0
" 2nd	.....	load	10	0	0	16	10
" 3rd, &c.	.....	load	7	0	0	10	0
" Spruce, 1st	.....	load	8	15	0	11	0
" 3rd and 2nd	.....	load	6	10	0	8	0
New Brunswick, &c.	.....	load	6	0	0	8	0
Battens, all kinds	.....	load	6	0	0	16	0
Flooring Boards, 1st	.....	load	10	0	0	14	0
Second	.....	load	8	0	0	10	0
Other qualities	.....	load	0	0	0	10	0
Cedar, Cuba	.....	load	0	0	0	10	0
Honduras, &c.	.....	load	0	0	0	10	0
Mahogany, Cuba	.....	load	0	0	0	10	0
St. Domingo, cargo average	.....	load	0	0	0	10	0
Mexican	.....	load	0	0	0	10	0
Yucasco	.....	load	0	0	0	10	0
Honduras	.....	load	0	0	0	10	0
Teak, Key	.....	ton	0	0	0	13	0
Rio, Rio	.....	load	0	0	0	13	0
Bahia	.....	load	13	0	0	18	0
St. Domingo	.....	foot	0	0	0	1	3
Porto	.....	load	0	0	0	1	3
Shut, Italian	.....	load	0	0	0	1	3



## CONTRACTS.—Continued

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be received
*Clearance of Blocks of Buildings	West Ham Council	Lewis Allen	July 15
Police Stations, Northwick & Midwich	Standing Joint Comm.	do.	do.
Residential Buildings, Witley	Sherrins Local Board	Official	do.
*Materials for Wood Paving Works	Kingsley Vestry	T. W. E. Higgins	do.
*Works for the Gas Works	Gas Works Vestry	E. J. Lovegrove	do.
*Stones for Kettling, &c.	Luton Corporation	G. R. W. Wheeler	July 16
*Works for the Gas Works	Westminster Vestry	do.	do.
*Cycle Factory, Coventry	Coventry Machinery	do.	do.
*Repairs, & Hot-Water Heating Apparatus	Co. Lim.	H. W. Chaffarney	do.
Building a new "Glympis, Belfast	Messrs. Gwynn	Official	July 17
Residential Buildings, Witley	Fulham Union	Sam'l Stevenson	do.
*Granite Supply	Harrow Local Board	Halliday & Anderson	July 18
*Roofs of St. Martin's, &c.	St. Martin's Vestry	E. R. Cohen	July 19
*Repairs of the Gas Works	Newington Vestry	Official	July 21
Paving and Planting Bridges	Northampton Vestry	do.	do.
*Water Conveyances, Highbury Fields	Northampton County Coun.	do.	do.
*Draining	River Newnham Comm.	do.	do.
New School House, Mitcham	London Vestry	H. Saxon Snell	July 23
Repointing, Brick Walls, &c.	11 Albion Union	do.	do.
*Extension of Sewers & House Connections	Dorking Local Board	G. Somers Mathews	July 24
Cast-iron Pipes, Sluice Cocks, &c.	Forport Local Board	do.	do.
Police Quarters at Carlisle	Committee	Official	No date
*Works for the Gas Works	Gas Works Vestry	Official	do.
Schools, Plaisteads, &c.	Sheffield School Board	C. J. Innes	do.
*Laying-out Streets and Erecting Cottages	L. & N. W. R. Co.	Official	do.
Weyford	do.	do.	do.

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised	Salary	Applications to be sent
*Clerk of the Works	Dorchester Union	£200	July 8
*Professionalism of Mechanical Engineering	[Kings College]	Not stated	July 9
*Clerk of Works	Portsmouth Municipal Council	£212 per week.	July 10
*Superintendent of Sanitary Department—	St. Mary (Ailington)	200l.	July 12
*Inspector of Street Cleansing	Birmingham Public	do.	do.

*Contracts pp. ii., xiii., and xiv.*

## PUBLIC APPOINTMENTS

Nature of Appointment.	By whom Advertised	Salary	Applications to be in
*Clerk of the Works . . . . .	Dewbury Union		July 8
*Professorship of Mechanical Engineering . . . . .	(King's College	Not stated	July 9
*Chief Clerk of Works . . . . .	Tottenham Sch. Bd.	31 per week.	July 10
*Superintendent of Sanitary Department . . . . .	St. Mary (Hullington)		
	Vestry	2000.	July 12
*Inspector of Street Cleansing . . . . .	Birmingham Public Works Committee.	5 per week	do

xviii.

[Communications for insertion under this heading must reach us *not later than 12 noon on Thursdays.*]

BODMIN.—For additions, &c., to buildings at county lunatic asylum, Bodmin, for the Visiting Justices and Committee. Mr. W. J. Jenkins, architect, Bodmin:—		
W. H. Buscombe .....	£1,320	0 0
Shelley & Sons .....	1,235	0 0
J. Rowe .....	1,120	0 0
G. Best .....	1,075	0 0
R. Grose (accepted) .....	1,050	0 0
(All of Bodmin.)		

**BROMLEY (Kent).—**For constructing a new road at Bromley Common, for the Bromley Local Board. Mr. Hugh S. Cregeen, Surveyor:—

E. Peill & Sons .....	£285	0	0
T. Lansbury (accepted) .....	260	10	0

BROMLEY (Kent).—For making-up Yester-road, for the Bromley Local Board. Mr. Hugh S. Cregeen, Surveyor:—

J. C. Trueman .....	£240	0	0
E. Peill & Sons .....	247	17	6
T. Lansbury (accepted) .....	242	14	1

**BROMLEY (Kent).—**For sewer extension in Plaistow Lane, for the Bromley Local Board. Mr. Hugh S. Cregeen, Surveyor:—

J. C. Trueman .....	£126 0 0
T. Lansbury .....	116 17 0
E. Peill & Sons .....	113 0 0
J. Rose (accepted) .....	107 16 6

<b>PAIRFIELD</b> (Lancashire).—For the erection of a villa residence, coachhouse, and stables, for Mr. Wm. Johnson.		
Messrs. J. H. Burton, architect, Ashton-under-Lyne.		
W. Hurst, Drydriels.	£3,048	0
J. W. Williamson, Ashton-under-Lyne.	2,966	0
E. J. Jackson, Chester.	2,800	0
Jabez Gibson, Dukinfield.	2,860	0
Underwood Bros., Dukinfield.	2,860	0
Fildes & Bowness, Ashton-under-Lyne.	2,819	0
Thos. Storer, Denton.	2,800	0
R. Whittell, Manchester.	2,796	0
G. C. Smith, Manchester.	2,750	0
Jos. Bates, Drydriels.	2,750	0
Jos. Dawson, Manchester.	2,780	0
C. G. Smith, Ashton-under-Lyne.	2,753	0
C. Wallworth, Gorton (accepted).	2,750	0

FARNWORTH.—For decorative work at Farnworth Parish Church :—  
R. Bennett, Manchester (accepted).. £350 0 0

HERTFORD. — For erecting new station hotel, Hertford, Mr. James Farley, architect, Hertford. Quantities by Mr. Theo. P. Pietersen, 191, Euston-road, London:—

Atterbury, Harrop, Latham	42,700	0	0
J. W. Walker, London	2,895	0	0
H. M. Dove, Watford	2,090	0	0
Thomas Hunt, Ware	1,990	0	0
Henry Norris, Hartford	1,963	0	0
C. Miskin, St. Albans	1,963	0	0
John A. Hunt, Hoddesdon	1,950	0	0
Kirk & Randall, Woolwich	1,941	0	0
Claridge & Bloxham, Banbury	1,897	0	0
G. E. Wallis & Sons, Maidstone	1,838	0	0
W. B.-I. & Sons, Saffron Walden	1,867	0	0
S. E. & F. W. Wallington, London	1,862	0	0
S. & W. Pattinson, London	1,850	0	0
J. Wilmott & Sons, Hitchin	1,800	0	0
F. Dupont, Colchester	1,793	0	0
French & Ellwood, Sandy	1,746	0	0

LEICESTER.—For erecting St. Leonard's Vicarage, Leicester. Mr. J. C. Traylen, Diocesan Surveyor, archt.

Street.	£	s	d	Sewers.
Roberts Bros., Stamford	£1,198	0	0	£120 0
S. F. Halliday, Stamford	1,197	5	0	88 0
T. & E. Bentley, Leicester	1,158	0	0	73 0
T. H. Herbert, Leicester	1,134	0	0	103 10
W. Jewsbury, Leicester	1,110	0	0	80 0
Clarke & Garrett, Leicester*	1,100	0	0	95 0
T. Bland & Son, Leicester	1,075	0	0	90 10
N. Elliott, Leicester	1,073	5	0	83 0
T. Hutchinson, Leicester	1,054	10	0	90 16
H. Bland, Leicester	1,040	0	0	85 0
G. Duxbury, Leicester*	999	0	0	79 0

LONDON.—For the erection of a school to provide accommodation for 780 children on the site in Ancona-road, Plumstead, and also for the erection of a schoolkeeper's house, with a cookery classroom underneath, for the School Board for London. Mr. T. J. Bailey, Architect:—

		TF brickwork is built in cement.
Colls & Sons .....	£16,410	.. £10,651
Dove Bros. ....	16,234	.. 16,438
Fatman & Fothering-		
ham .....	16,189	.. 16,404
B. F. Nisgingle .....	16,117	.. 16,274
J. Grover & Son .....	16,010	.. 16,235
E. Lawrence & Sons .....	15,923	.. 16,193
Stephens, Bastow & Co.	15,838	.. 15,978
Rilby & Gayford .....	15,615	.. 15,806
J. Mowlem & Co. ....	15,610	.. 15,750
Kirk & Randall .....	14,827	.. 15,052*
*Recommended by the Works Committee for acceptance.		

LONDON.—For the erection of a covered playground for the boys' department of the Belvedere-place School, Borough-road, for the School Board for London. Mr. F. J. Bailey, Architect:—

H. Mallett.....	£278	0	0
W. Hammond.....	244	0	0
Maxwell Bros.....	219	0	0
The Co-operative Builders, Limited..	210	0	0
H. & H. F. Higgs *.....	207	0	0

\* Recommended by the Works Committee for acceptance.

LONDON.—For supplying heating apparatus on the low-pressure hot-water system to the Junior Mixed school, now in course of erection on the "Latchmere" site, Battersea Park-road, and also extending the apparatus to the graded school, for the School Board for London. Mr. T. J. Bailey, Architect;—

W. W. Phipson .....	£1,150	0	0
J. G. Wagstaff .....	961	0	0
Longden & Co. ....	866	10	0
J. & F. May .....	862	0	0
C. J. Kinnell & Co. ....	850	0	0
Rosser & Russell .....	764	10	0
Wontner Smith, J. Gray, & Co ...	750	0	0
Russell & Nibbs .....	29	0	0

\* Recommended by the Works Committee for acceptance.

LONDON.—For work to be done in constructing an on girder footway-bridge, with approaches, over the West London and London, Chatham, and Dover Railways, at Culvert-road, Battersea, for the London County Council. Mr. Binnie, Engineer:—

J. Dickson.....	£3,647	0	0
Holme & King.....	3,138	0	0
Alfred Thorne.....	2,776	0	0
Geo. Double.....	2,670	0	0

LONDON.—For pulling down and rebuilding "The George and Dragon," New North-street, for Messrs. Matthews & Canning. Messrs. Karslake & Mortimer.

architects:—		
Holloway Bros. ....	£1,705	0 0
Toten & Sons .....	1,830	0 0
Picken, Chelsea .....	1,584	0 0
McCormack & Sons .....	1,570	0 0
Patman & Fotheringham.....	1,520	0 0

LONDON.—For rebuilding 46, Kennington-road.  
Messrs. Hudson & Booth, 17, Goddian-street, E.C.  
architects. Quantities by Mr. H. Lovegrove, 26, Budge-  
row, E.C. :—

W. Larter & Son .....	£2,275	0	0
John Greenwood .....	2,183	0	0
J. Morter .....	2,115	0	0
Hall, Beddall & Co. ....	2,110	0	0
F. and H. F. Higgs .....	2,084	0	0
Spencer & Co. ....	2,080	0	0
S. J. Jerrard .....	1,987	0	0

LONDON.—For the supply of 1,500 cubic yards of blue Guernsey granite road metal at Brentford, for the Brentford Local Board. Mr. J. H. Strachan, Surveyor, Clifden House, Boston-road, Brentford : . . . For cubic yard

	s.	d.
Fennings & Co., London Bridge .....	15	4
Nowell & Robson, Kensington .....	15	4
A. & F. Manuelle, Leadenhall-street ....	15	2
Mowlem & Co., Westminster (accepted)..	14	11

LONDON.—For redecoration and other work to Walworth-road Chapel. Mr. John Edward Sears, architect :—

Wm. Sayer .....	£505	0	0
G. Schickelmann .....	505	0	0
W. Hayward & Son .....	540	0	0
Laws & Son .....	433	0	0
Pitman & Son .....	438	0	0

LONDON.—For repairs, painting, &c., to the chapels, lodges, &c., at Tooting Cemetery, for the Burial Board of Lambeth. Mr. W. Chutter, surveyor:—

Fitch .....	£107	7	0
Reddish .....	94	10	0
Mallett .....	78	0	0

LONDON.—For supplying additional furniture and fittings for the new rooms under the Council Chamber at Spring-gardens, for the London County Council. Mr. Thomas Blashill, Architect:—

Gregory & Co. ....	£285 18 6
Vaughan & Co. ....	238 15 0
Newson & Co. (accepted) .....	188 10 0

LONDON.—For the erection of new gateways, &c., at their dispensary, East-street, Marylebone, W., for the Guardians of the Poor of the Parish of St. Marylebone. Mr. H. Saxon Snell, architect, London.

Wall Bros., Kentish Town .....	£429	0	0
Wm. Bamford, Pentonville .....	410	0	0
W. H. Lorden & Son, Upper Tooting .....	379	0	0
Thos. Nye, Ealing, Middlesex .....	389	0	0
G. Godson & Sons, Kilburn .....	313	0	0

LONDON.—For alterations and additions to the "Spanish Patriots" tavern, White Conduit-street, Islington, for Messrs. F. J. Newport & Co., by Fred. G. Grierson, architect, 9, Old Jewry-chambers, E.C. 4.—

H. H. Hollingsworth.....	£294	0	0
S. Goodall.....	255	0	0
Courtney & Fairbairn.....	258	0	0
Olver & Richardson.....	253	0	0
F. Vollar, Wood-green.....	251	0	0



LONDON.—For lowering basement and constructing new buffet and various alterations at 122, Newgate-street, E.C., for Messrs. Divian Bros.:—  
Huwel J. Williams, Barmesday.  
Stowell (accepted) ..... £287 10 0  
[No competition.]

LONDON.—For extra work to be done in connexion with pontoons, grid, dolphin, watermen's steps, &c., at the Woolwich Ferry, for the London County Council.  
Mr. Binole, Engineer:—  
John Mowlem & Co. .... £144 0 0  
[Only one tender received.]

MORTLAKE (Surrey).—For the erection of a Conservative Club, for the Mortlake Conservative Club Company, Limited. Mr. Thomas Potter, architect, Sevenoaks:—

	Club and hall.	For gallery.	Time.
J. Hill, Barnes	3,768 18	195 10	6 months.
D. Charteris, London	2,987 0	160 0	7 months.
R. G. Hughes, Mortlake	2,822 0	175 0	No time.
Kilby & Gayford, Finsbury	2,867 0	157 0	6 months.
Goddard & Sons, Farnham	2,845 0	162 0	9 months.
G. W. Headley, Richmond	2,835 0	179 0	—
Landdown, Richmond	2,820 0	169 0	—
Wallis & Sons, Maidstone	2,794 0	148 0	6 months.
A. Hunt, Barnes	2,719 0	146 0	6 months.
G. Toms, Camden Town	2,719 0	138 0	6 months.
Egan & Co., Mortlake	2,705 0	130 0	6 months.

\* Accepted subject to deductions.

SALISBURY.—For repairs and alterations at Laverstock Farm-house, near Salisbury, for Mr. Charles Blake. Mr. Fred. Bath, architect, Salisbury:—

J. Rawlings, Salisbury	2,470 0 0
Gilbert Harris, Salisbury	492 0 0
E. Witt, Salisbury	453 0 0
F. Day, Salisbury	401 8 6
J. M. Jenkins, Salisbury	370 0 0
T. Grace, Fulflood, Winchester	364 18 0
J. Wort, Salisbury	304 0 0
A. & J. S. Curtis, Salisbury	297 0 0

\* Accepted.

SALISBURY.—For alterations and additions to Fisherton National School, for the trustees. Mr. Fred. Bath, architect, Salisbury:—  
H. J. Rite, Salisbury (accepted) .... £193 0 0

SALISBURY.—For new room at the Maundrell Memorial Hall, for the trustees. Mr. Fred. Bath, architect, Salisbury:—  
W. J. & C. S. Young ..... £295 0 0  
H. J. Rite (accepted) ..... 259 15 0  
[Both of Salisbury.]

SHAMLEY GREEN (near Guildford).—For the erection of entrance lodge on the estate of Mr. C. D. Hodgson. Mr. T. C. Barrelet, architect, Bridge-chambers, Richmond, Surrey:—  
Harvey Brown, Bramley (accepted). .£485 0 0

SOUTH SHIELDS.—For the erection of new studio and alterations at No. 8, Ogle-terrace, South Shields, for Mr. Wm. Parry. Mr. Henry Grieves, architect, Albany Chambers, South Shields:—  
William Scott, South Shields\* ..... £493 7 0  
\* Accepted.

SOUTH STOCKTON.—For the erection of new public offices, for the South Stockton Local Board. Mr. J. M. Garry, architect, West Hartlepool:—  
W. C. Atkinson, Stockton (accepted) £3,327 3 6  
[Seven other tenders: highest, £4,300.]

WOLVERHAMPTON.—For the erection of villa residence, Tottenhall-road, for Mr. Rupert Belcher. Mr. Joseph Lavender, architect, Wolverhampton. Quantities by the architect:—

B. Guest	£892 14 0
Bradney & Co.	913 0 0
H. Gough	909 0 0
T. Hall-burch	964 0 0
G. Cave	875 0 0
C. Ford & Sons (accepted)	850 0 0

[All of Wolverhampton.]

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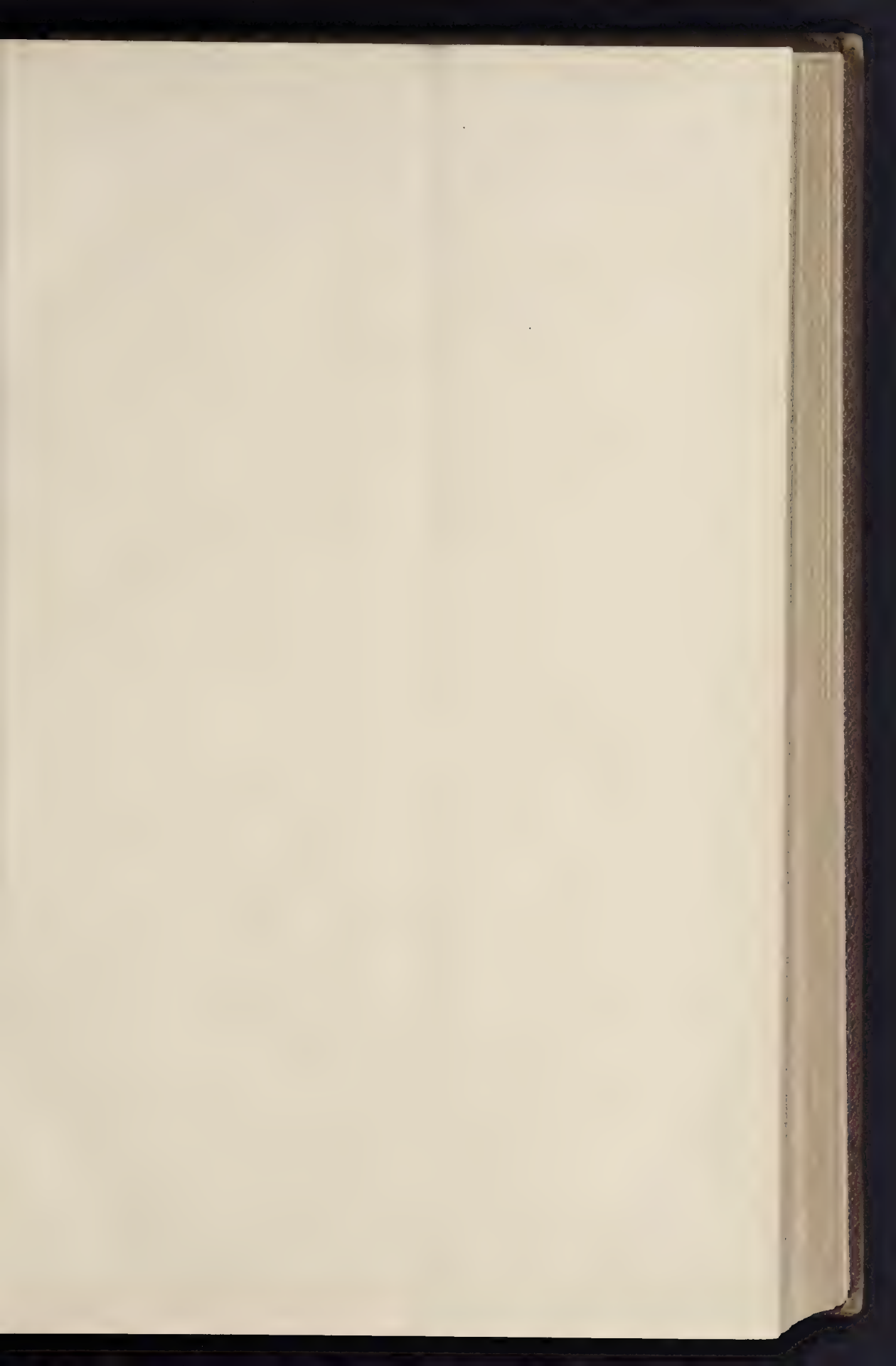
— MODELS AND SECTIONS ON VIEW. —  
LONDON: LIVERPOOL: GLASGOW:

352 to 362, EUSTON ROAD.

6 and 8, HATTON GARDEN.

47 & 49, ST. ENOCH SQUARE.







THE BUILDER, JULY 6, 1890.







Pavillon d'Orbaine de Medias  
Blois

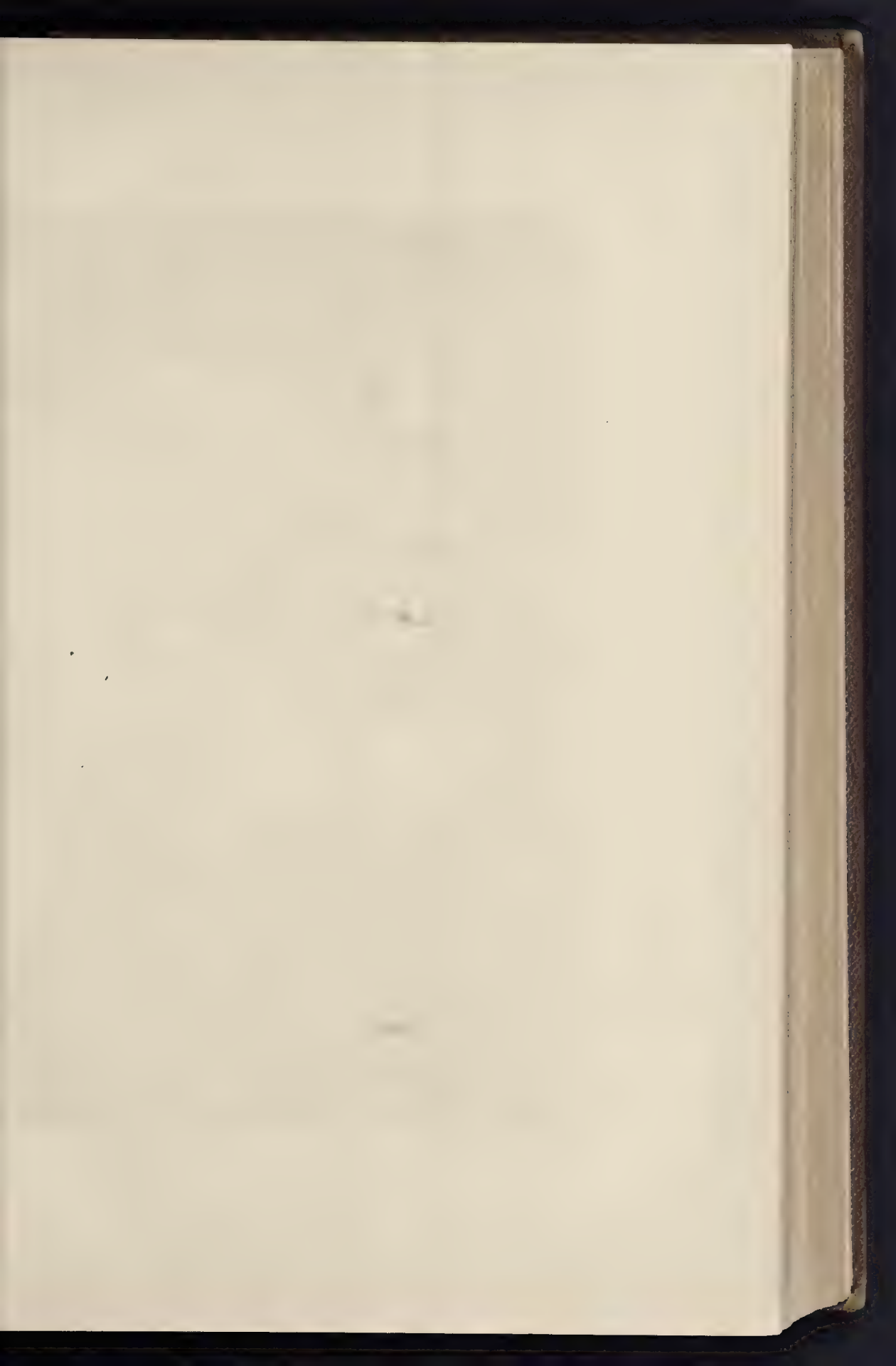
DRAWN BY M<sup>rs</sup> HERBERT RAILTON

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SHEFFIELD MUNICIPAL BUILDINGS: FINAL COM



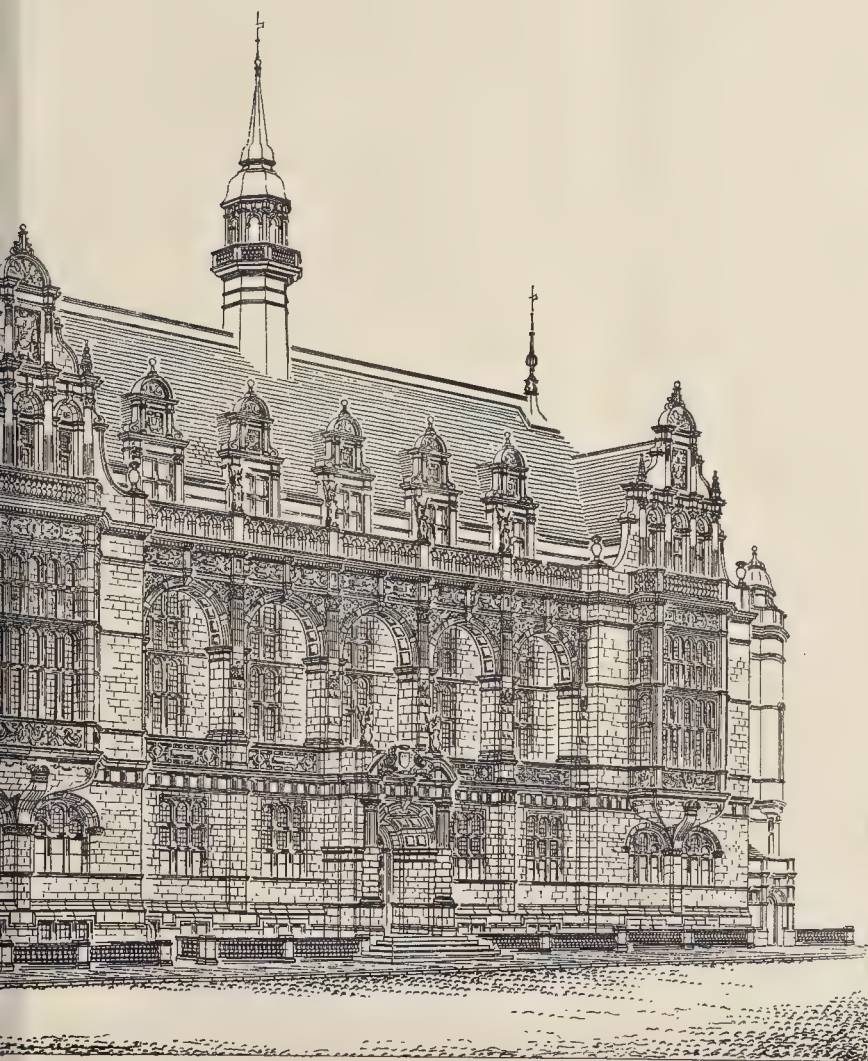
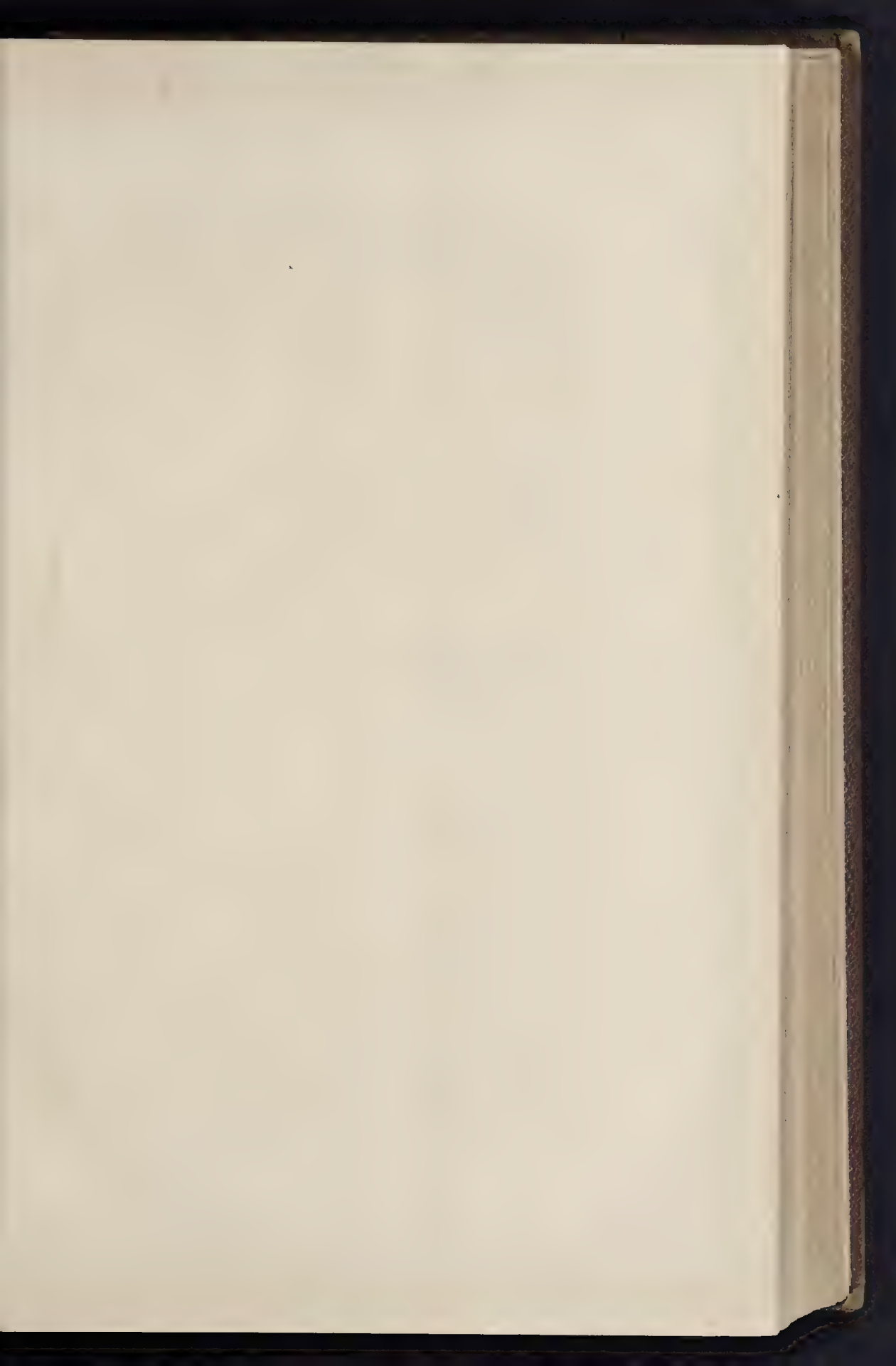


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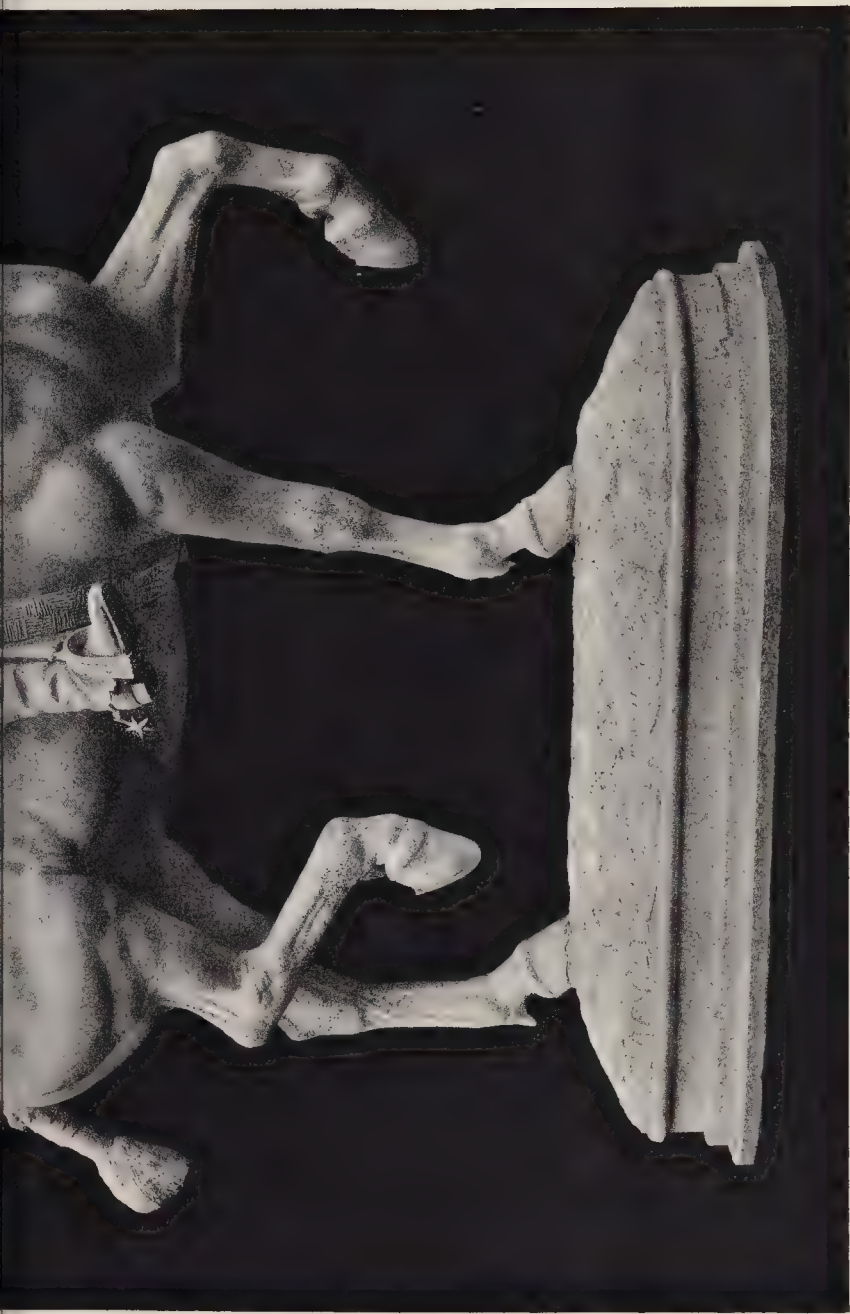




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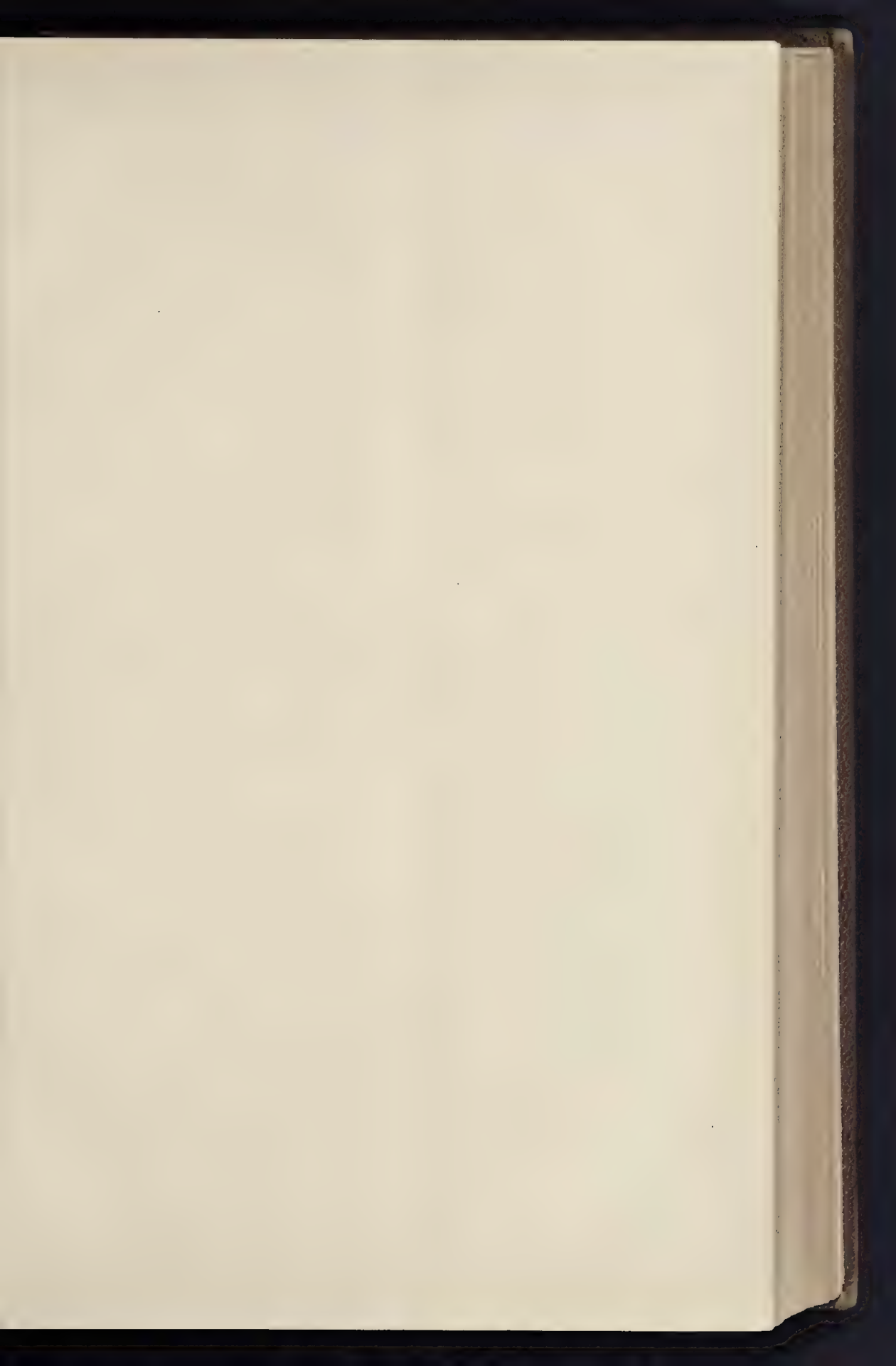


"VELASQUEZ."—M. FREMITT, SCULPTOR.

*Paris Salon, 1890.*







THE BUILDER, JULY 5, 1890



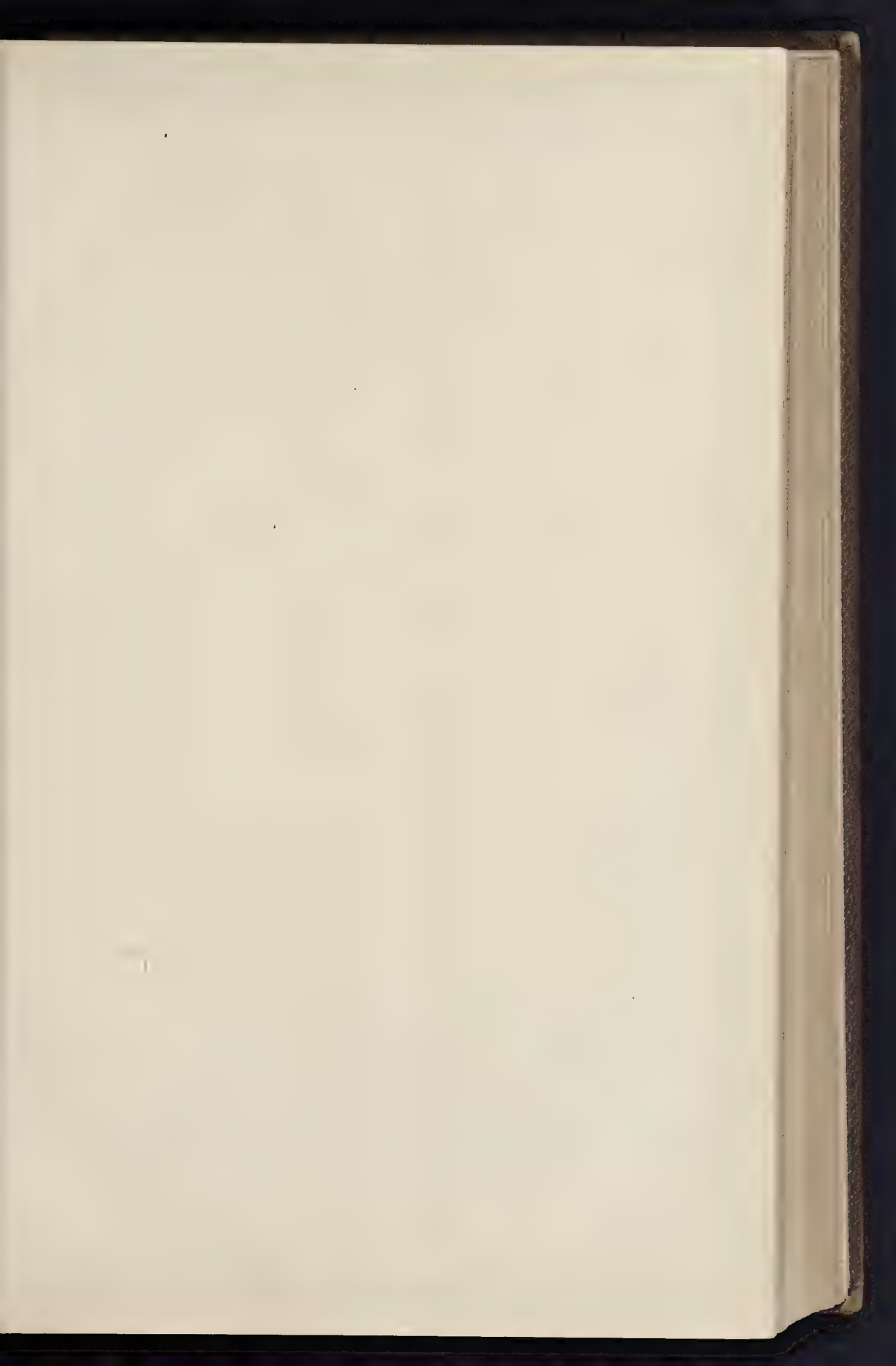


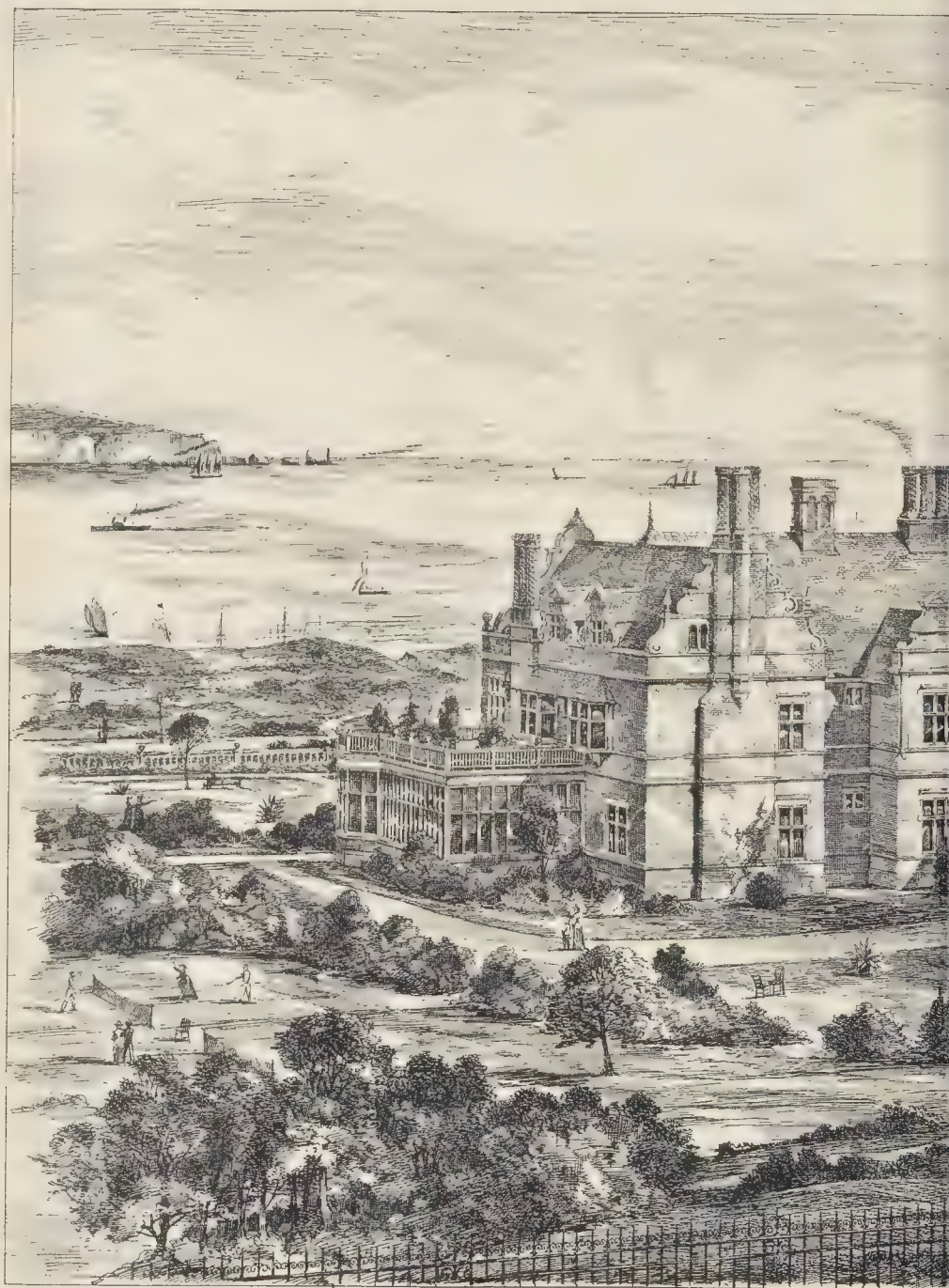


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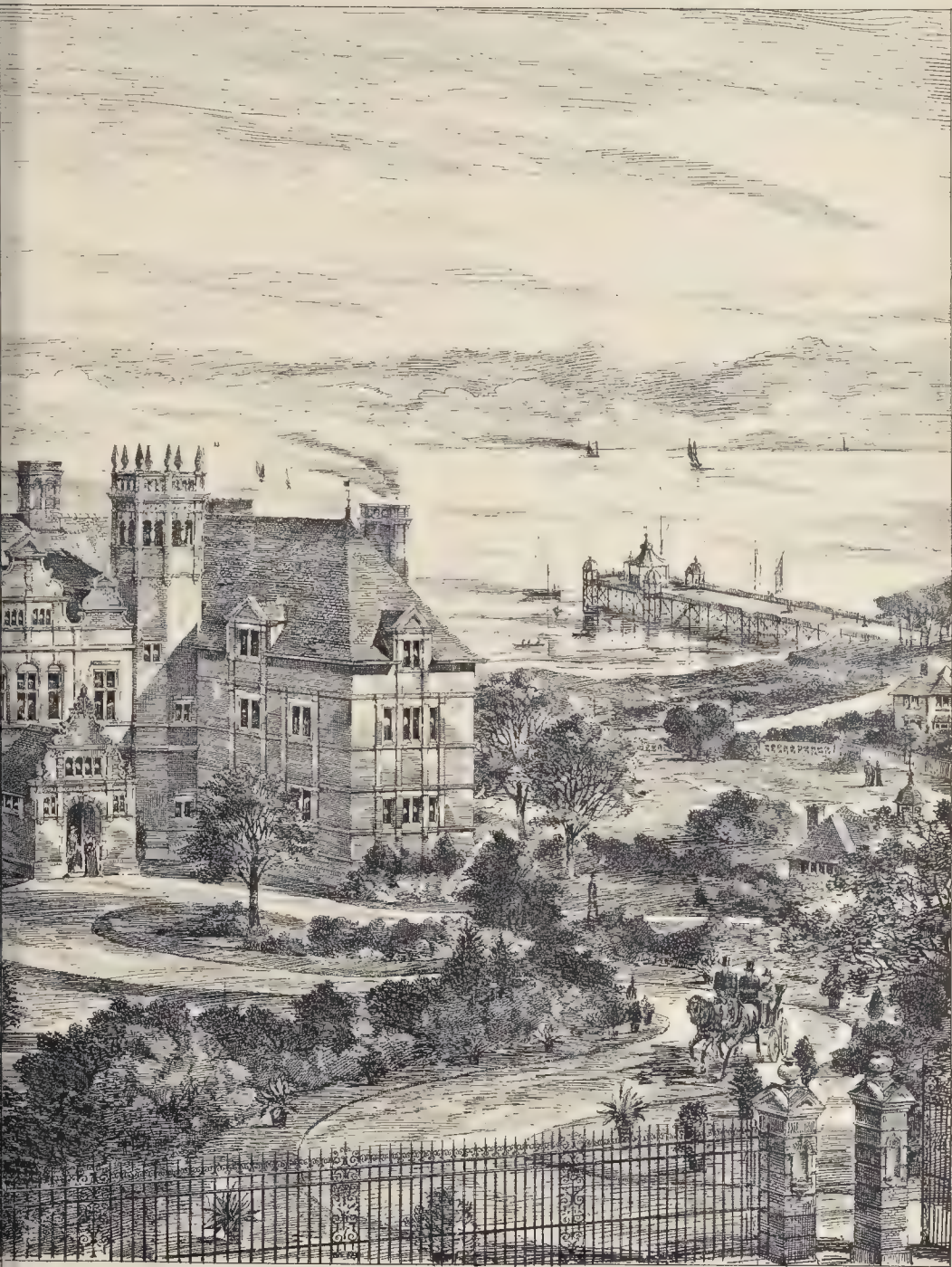


PHOTO. L. THO. SPRATJE & CO. 32 MARTIN LANE, LONDON E.C.

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# The Builder.

Vol. LIX. No. 2475.

SATURDAY, JULY 12, 1890.

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The Palazzo Albergati, Bologna: Baldassare Peruzzi, Architect, 1540.—Front Elevation and Detail of same.—Measured and Drawn by Mr. W. J. Anderson, Architect	Two Single-Page Photo-Litho's.

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### The Late Sir Edwin Chadwick.



HERE are probably many of our readers, even in that uncertain and variously defined stage of existence called middle life, who have only a very inadequate idea of the im-

portant part played in the sanitary reform of modern England by the aged apostle of sanitation who died on Saturday last. Sir Edwin Chadwick's life has been so long a one, and the principal part of the work he did for this country, in awakening it to the disgraceful sanitary state of a considerable portion of the community and to the possibility of immensely improved conditions of life for all, has been so long accomplished and passed into the region of accepted principles, that few people realise now how dire was the fight to bring about this improved state of things, and what an immense debt England owes to Chadwick. If we compare the present state of sanitation in English towns and in private and public buildings with that which existed half a century ago, we find (much as there is yet to be done) a quite extraordinary revolution in the attention given to sanitation and the means employed to ensure it; and the revolution in public and private opinion upon and interest in the subject is still more remarkable. This revolution no doubt must have come sooner or later; but that it came when it did, and that we are not half or a quarter of a century later, is mainly due to the clear perception, the strong will, and the unceasing pertinacity in the cause of sanitary reform of one man.\* Born at the commencement of the century, and entering upon his sanitary campaign in the early part of his life, his principal labours are now so far out of the memory of all but the oldest that it is perhaps difficult to realise what an important figure Chadwick was in the decade between 1835 and 1845. We get a hint of it in an expression in Charles Kingsley's perhaps most characteristic book, "Yeast," which though largely occupied with the question of the

condition of the poor, sanitary and moral, was essentially a popular book: one speaker remarking that the present century wants its epic poem, his friend replies, "Write one yourself, and call it 'The Chadwickiad':—

'Smells and the Man I sing;'

There's a beginning at once;" in allusion to the *arma virumque cano*, of the "Æneid." And Dr. Richardson, in his unfortunately very ill-arranged *résumé* of Chadwick's writings under the title of "The Health of Nations," quotes in his biographical sketch a *Daily News* article of the period, giving an account of the attitude taken by Chadwick at the enquiry, in 1846, into the conduct of the Commissioners of the Poor Law Board, when, although Chief Secretary to the Board, he gave evidence of their disregard of reported abuses and illegal practices. "Chadwick stands alone, dark and terrible as Milton's hero, confronting the three Commissioners, who are waxing more and more vehement. It is not easy to conceive how the belligerents are to be got to meet on terms of truce." The result was as predicted: the Board was dissolved; and in this case Chadwick was probably in the right; though it must be admitted that, like other men with a strong sense of a mission, he had a considerable faculty of quarrelling with those who did not see things in the same light as himself.

The fault about Dr. Richardson's book, of which an abridged edition for more popular use has been since brought out,\* was, as we observed in a review of it some time since, that it was so compiled that it is difficult to make out from it where we are getting Chadwick's *ipsissima verba*, where it is an abridgment giving the substance of them, or where it is Dr. Richardson's own comment; defects which are just as apparent in the abridged edition under the title "National Health." Even the sub-title, "A Review of the Works of Sir E. Chadwick," seems chosen on purpose to puzzle the reader, the word "review" properly signifying, of course, a criticism, rather than an account, and being never used in the sense in which it seems to be used here. It is a great pity that this is the case, because Chadwick's testimony with regard to the subject of his life's work is so scattered among articles, reports, papers at

meetings, &c., that a collection of them in one publication would have been a great convenience to students of the history of sanitation, as well as a desirable monument to Chadwick; but for want of literary method and perception Dr. Richardson, with the best intentions, has so carried out his task as much to diminish its value, and to produce what may be said to be one of the most unreadable books before the public.

The essay which, though in the first instance published anonymously, may be said to have laid the foundation of Chadwick's reputation as a practical philanthropist, contains on its very first page the indication of the line of work which he had marked out for himself, or which his temperament and special abilities marked out for him. This was the essay on "The Means of Insurance against the Casualties of Sickness, Deceit, and Mortality," contributed to the *Westminster Review* of April, 1828, and republished under the author's name, with some additional notes, in 1836. Setting out with the position that it is one of the most important duties of a good Government to enable the community to provide, at the least expense, against the casualties of sickness and mortality, "and to avert or dissipate those attendant evils by the apprehension of which life is embittered and impaired," he proceeds to observe "that the most readily attainable means towards this end is the collection of complete information as to the circumstances under which sickness arises, together with accurate accounts of the deaths consequent upon such circumstances . . . Accounts of this description, which perhaps at present a Government alone has the power to obtain in the requisite degree of perfection, would form an invaluable acquisition to science, and would direct the public exertions in removing those circumstances which shorten life, and in promoting those under which it is found to attain its greatest and most happy duration." There is rather a confusion of ideas, if not of grammar, implied in the last three words; what Chadwick meant was increased duration of life under conditions most compatible with happiness; but the sentence we have italicised sums up in brief the main effort of Chadwick's life,—to remove the circumstances which shorten life." To provide that the life thus lengthened should be happy is a matter a little way beyond the reach of Parliamentary statistics and legislation, seeing that it depends very largely on individual tempera-

\* We must be allowed also not to forget the important assistance given to the cause of Sanitary Reform by the late Mr. George Godwin.

\* "National Health": abridged from the "Health of Nations," a Review of the Works of Sir Edwin Chadwick, K.C.B. By Benjamin Ward Richardson M.D., F.R.S. London: Longmans Green & Co.: 1890.

ment as well as on family and other relations which cannot be affected by Act of Parliament. But to remove the avoidable causes which shorten life is at any rate to provide the first and most indispensable condition for adding to the sum of happiness of human life, that of adding to the extent of life itself. There may be life without happiness, but there cannot be happiness without life.

Chadwick was one of those practical and dogged natures which ask "Why?" to everything, and will be content with nothing short of an exhaustive reply. The particular question which he put to his generation was, "Cannot we live longer?" and he was possessed of that stubbornness of purpose which persists in repeating the question till a full reply is received, or as full a one as existing circumstances permit of. It was this stubborn and uncompromising "why?" of Chadwick's which has more than anything else brought about the sanitary reform which has so materially lengthened the average duration of life in this country during the last fifty years. He was not perhaps so much an initiator of remedies as an exponent of defects; but in such a matter as the healthiness and duration of life, to point out clearly the obstacles to that condition is to do nine-tenths of the work. The whole of mankind desire to be healthy and long-lived, but many of them still, and a far greater proportion half a century ago were, too ignorant and indolent on the subject to give any consideration to the avoidance of conditions inimical to health. Fifty years ago the greater proportion of the upper classes were in the same mental position in regard to questions of sanitation as that in which the majority of the poorer classes still are; they suffered disease and death to prey upon them to an extent that was quite unnecessary and avoidable, and accepted it as a visitation of God, through the indifference of sheer ignorance. Chadwick's persistent "why?" gradually gained a hearing among intelligent people, urged as it was with that pertinacity and one-sidedness which, however it be a defect in character in one sense, is an almost necessary quality for any man who would rouse a whole generation to the perception of a neglected truth. Chadwick attacked however not merely ignorance and indifference, but that kind of wilful ignorance in which rather small-minded people indulge, half-unconsciously, when the facts attempted to be thrust upon them are against their own interests. "The great crime of the class of practical men," he says in the *Westminster Review* essay, "is their dishonest dealing with evidence; shutting their ears to it, and when it is forced upon their perception, depreciating it, conjuring up fictitious obstacles, and exaggerating the force of real ones. When any measure constituting a change is presented to such minds, the question usually asked is not, 'Is the evidence in support of it sound and complete?' but, 'What shall I gain or lose by admitting it?'" It was in this spirit that the actuaries of Insurance Societies who were asked to revise their premiums in the public interest, on the ground that the average of life, according to statistics, was lengthening, refused entirely to see the facts. "Of those absurd opinions," said one of them, "which have lately been entertained concerning the improved health and longevity of the human race, I have no disposition to enter into the discussion . . . and I can only express a hope that they will never be suffered to mislead this society" (into reducing its charges to the public). The promised average longevity has been extended beyond what was then suggested, but the most striking fact in connection with this scepticism of Insurance Companies is the practical evidence afforded by the prophet of longevity himself, in his ninety years of vigorous life. It is not always that a sanitary reformer is able to exhibit in his own career such a remarkable corroboration of the truth of his own teaching. It was in 1838 that the first Sanitary Commission was appointed in England, owing in

the first instance to a direct application made to Chadwick, while still Secretary of the Poor Law Board, by the parochial authorities of Whitechapel, who were greatly alarmed at a severe outbreak of disease in their neighbourhood for which they could not account. The Secretary persuaded the Board to institute a medical Commission of Inquiry, in accordance with what we have already described as the object he continually kept in view, viz., to find out the causes tending to disease. The report issued by this committee, which is before us, gives some idea of the state of things at that period, the statistics more than confirming some of the graphic and picturesque sketches of the then state of the dwellings of the poor given by Kingsley in "Yeast" and elsewhere. As a specimen we may take the following from a report on the sanitary (?) condition of Greenock. Commenting on the number of cases of fever coming from one narrow street, which contained the lowest description of houses, the medical reporter wrote:—

"In one part of the street there is a dunghill—yet it is too large to be called a dunghill. I do not misstate its size when I say it contains a hundred cubic yards of impure filth, collected from all parts of the town. It is never removed; it is the stock-in-trade of a person who deals in dung; he retails it by cartfuls. To please his customers, he always keeps a nucleus, as the older filth is the higher is the price. The proprietor has an extensive privy attached to the concern. This collection is fronting the public street; it is enclosed by a wall; the height of the wall is about 12 ft., and the dung overtops it; the malarious moisture oozes through the wall, and runs over the pavement. The effluvia all round this place is horrible."

This is only a small portion of the description; it may serve to realise how far we have at all events advanced since then, and what was the magnitude of the evils with which the sanitary reformer at that date had to deal.

Among the subjects to which Chadwick turned his attention was that of "The Economic, Social, Educational, and Political Importance of open Competitive Examinations for admission to the Public Service." To a statistical mind it is natural that all the advantages and proprieties of this form of appointment would present themselves in their most attractive light, and that the other side of the question, that of the personal quality of the candidate, would be overlooked. For the true statistical mind always regards men in the mass, as a class of beings influenced in a certain direction by certain conditions, and to be dealt with in the mass accordingly. In general and at the time there is no doubt that the competitive examinations gave an impetus to the services in connection with which they were instituted; but it is none the less true that competitive examination is not an infallible way of discovering the best man for a post in which action and self-reliance are required, and that there is a weak side to this method of selection which Chadwick was quite unable to see. His essay, read before the Statistical Society of Manchester, "On the demoralisation and injuries occasioned by the want of proper regulations of labourers engaged in the construction of railways" is not open to any such criticism, and is an admirably-written plea for a class of labourers who appear to have been at that time in a perfectly heathen state of demoralisation as regards their way of life out of working hours, and even as regards the proper execution of their work, owing to the total neglect and indifference to their moral and material interests on the part of the companies employing them. Chadwick had perception enough to see at that time, speaking of railway accidents, that 30 per cent. of these might have been prevented by the proper use of the electric telegraph (then in its infancy); but observed that the directors "do not care to inform themselves" on the subject.

The address on Railway Reform, read at the Social Science Congress of 1865, is a remarkable paper for the time at which it was written, in its endeavour to show (what some railway companies have not even yet

found out) that it was to the interest of the companies to promote the comfort of their passengers of all classes, to consider how much and not how little they could give them; and he was one of the first or perhaps the first to point out the now generally recognised fact that it was from the third class passengers that the bulk of a railway company's income really came. He was also bold enough to say at that date, that if the railway system had been laid out with trunk lines for fast passenger traffic only, it might have been possible to go from London to Liverpool in three hours and a half instead of five and a half (the then time), the reduction of speed being mainly owing to the crowding of a road with mixed traffic. It was too late then (1865) to revise the general system of railway rates of the country, but his advanced ideas as to the speed possible with well-constructed lines and carriages are worth noting.

The treatise on "The Evils of Disunity in Central and Local Administration," published in 1885, and therefore one of the latest works which Chadwick produced, is a remarkably comprehensive sermon on the text, "Always do the same thing in the same way, choosing the best, and always call the same thing by the same name." This idea of unity and homogeneity of administration is the kind of thing that of course forms one of the foibles of the man of statistical mind, and probably Chadwick ignored the fact that this principle of unity, in the wrong hands, is apt to be the parent of great deal of useless and harassing red-tape legislation; but when secured by wise administration from abuses, there is no doubt that the view here inculcated by Chadwick is the right one. Chadwick gives a telling instance of the advantages of unity of administration in regard to the outbreak of cholera in this country:—

"As an illustration of the large gains derivable from unity, I may state that on the advent of that great epidemic we obtained information of past experience from one practitioner in a remote district, that the advent of the disease was in almost all cases preceded by premonitory symptoms, which were amenable to immediate treatment. This early treatment was as soon as possible adopted throughout the country to meet the epidemic, and it was so, with the result of a proved saving of some 56,000 lives as compared with the death-rate on the Continent, where the treatment had not been heard of, or was neglected. If Scotland had been under a smaller separate administration, it would, in the usual course, have only heard of the treatment some time after it had been adopted in England, and only have adopted it slowly, and executed it with a slower and smaller and feebler administration, and with a delay which would unquestionably have cost some thousands of lives."

This is certainly a case in point, in favour of unity, and which is capable of pretty large application.

The last separate publication of Sir E. Chadwick was, we believe, his criticism on the "Report of the Royal Commission on Sewage Discharge," a publication very typical both of the author's merits and defects as a writer and critic on sanitary matters. It exhibits in a more than usual degree his characteristic inability to state his views in a clear, well-arranged, and logical manner, so that it is necessary to compare all his paragraphs very carefully to find out what he is really driving at in any one passage, and it is not always easy to do so. Then Chadwick wanted to put one main truth in an incisive and concentrated manner, he could do that admirably in a brief pithy sentence that stamped itself on the memory; but the manner in which he leads up to or leads away from his main points is often most irregular and illogical in arrangement; the relation of one argument or statement to another (perhaps quite clear in his own head) is not made clear to the reader, and this makes his writings a provoking kind of study even in their original form, still more in Dr. Richardson's redistribution of them. The critical pamphlet on the Sewage Report is as noteworthy for its trenchant hits in places as for its want of general lucidity. Of the hits there are some that will be heard of again, probably, especially the sentence



which draws attention to the fact (which, if it be a fact, has been curiously overlooked by sanitary skirmishers), that while the purification of the Thames is held up as the great sanitary need of London, there are no statistics to show that the ratio of sickness or mortality near the river is greater than elsewhere. In remarking on this comment of Chadwick's, we are not for a moment suggesting any laxity in the endeavour to get the Thames clear of sewage at the first possible moment; but it may be that the reasons for doing so may be put on different grounds from those which have been sometimes advanced.

Sir E. Chadwick received no little recognition from scientific writers and others of the value of his work. In 1836 was published an elaborate work, well known in legal circles, entitled "Practical Treatise on the Poor Laws," by Mr. William Theobald, of the Inner Temple. It is dedicated to Mr. Chadwick, who was then secretary of the Poor Law Commissioners, and "whose superior powers of investigation," we are told, "probed the evil of past poor-law administration to the core, and developed it in a report worthy to rank with the celebrated article of Targot on Foundations." Dr. Marx, Professor of Medicine at the University of Gottingen, and Dr. Willis, the Librarian to the College of Surgeons, dedicated to Mr. Chadwick their work on the "Decrease of Disease as Affected by the Progress of Civilisation," remarking that "there is no man in this great Empire whose name can be so appropriately placed at the head" of such a work, and expressing the opinion that "your General Report on the sanitary state of towns [1842] is beyond all question one of the most valuable contributions that has lately been made to the noblest department of medical science,—the art of preserving the health of the community,—and will have an influence upon the human family as long as it exists." Dr. B. W. Richardson, in his dedication of that curious and interesting little book, "Hygeia: a City of Health," truly describes Sir Edwin as occupying the pre-eminent position of "the living leader of the sanitary reformation of this century." The late Sir Erasmus Wilson's standard work on Skin Diseases; Sir Robert Rawlinson's "Lectures on Sanitary Questions"; Sir Alfred Power's "Sanitary Rhymes"; Chambers's "Sanitary Economy"; Dr. Robert Pringle's "Asiatic Cholera," and an anonymously-published work in 1888, "The Natural History of Local Boards, or Local Government as it is," are all similarly dedicated to this Sanitary Father, in recognition of his great and lasting labours on behalf of the people.

Among various verses of an epigrammatic character, but in the complimentary sense of the phrase, which were addressed to Chadwick occasionally by friends or sympathisers, the following is worth quoting for its point:—

"If those for whom you life did gain,  
You on the battle-field had slain,  
You would have met with no rebuke,  
And long ere this been made a Duke."

Owing to the causes previously mentioned, it is not likely that Chadwick's writings will retain a permanent place in the English language, except now and then as references for students of the history of the subjects with which they are connected. They are, it must be confessed, dull reading,—more so than need have been even for the unattractive class of subjects with which they deal; and many of them were demonstrations against evils of the moment rather than permanent scientific treatises. These considerations detract nothing from the great and courageous work which Chadwick did in his generation; but they render it the more desirable that some national monument should be erected to him, such as would commemorate to future generations the debt which England owes to a man whose name and whose achievements, in promoting more healthy and just conditions of life among the poorer classes especially, a grateful country ought to record with honour for future generations.

#### "ARCHITECTURAL STUDIES IN ITALY."

THE memory of the Glasgow architect who was honourably known as "Greek Thomson" has been perpetuated in Glasgow not only by the notable buildings he has left behind him, but by the establishment of an "Alexander Thomson travelling studentship" of architecture, of which Mr. W. J. Anderson, author of the volume whose title is given above, and now president of the Glasgow Architectural Association, was in 1888 the first holder. The conditions of the studentship required a three months' absence and satisfactory evidence of the employment of the time in architectural sketches or measured drawings. This evidence is collected in the handsome folio volume\* containing reproductions from the author's sketches and drawings, not originally made with any intention of publication, which however is quite justified not only by the excellent character of the drawings, but by the fact that some of them illustrate buildings or details which have not yet been worn threadbare by the efforts of the architectural sketcher.

A considerable portion of the measured drawings illustrate the work of Baldassare Peruzzi, and among the most interesting of these are the drawings of the Palazzo Albergati at Bologna, two plates of which we reproduce by the author's permission; the third one gives large-size profiles of mouldings to scale. The building, as Mr. Anderson points out, is manifestly incomplete, the left-hand doorway having been evidently intended as the centre of the composition. It would have been a very long and low front when completed, but it is nevertheless a remarkable example of the effect attained by the Italian architects of the Renaissance by the simple and sober repetition of equally spaced windows, with their delicate and refined details standing out from an expanse of plain wall, and the whole dominated by the long and richly decorated cornice, unbroken in its stern horizontal line. The mass of the building is of brick, with stone only for the angles and decorative portions. The character of the details is sufficiently shown in the second of the plates reproduced, where should be noted the curious feature of the battered base crowned by a moulding, which is interrupted and returned upon itself somewhat awkwardly at the points where the doors are inserted. The general outline of this feature, with the proportions of its moulding, has a curious resemblance to the outline of an Egyptian pylon.

Plate xvi. gives a sketch of a house in Siena attributed to Peruzzi, a characteristic specimen of a smaller and non-palatial residence showing the same breadth of treatment; straight lines of windows in a mass of plain wall, and with a wooden cornice of great projection making a deep shadow along the upper portion of the front. Transferred to a northern climate this would look poor and dull enough; it is architecture for a sunlit country. Another of Peruzzi's works of which Mr. Anderson gives careful measured drawings is the more familiar Massimi Palace at Rome, with its rich decorative panels filled with sculpture over the doorheads; a little overweighing the doors, but giving a marked individuality of effect to the building.

The various smaller sketches which are given in the book, some of them of mere fragments of decorative detail, serve to remind one what an amount of variety there was in the Italian work of the Renaissance, a variety on the whole greater than is to be found in any period of Mediæval architecture. No doubt Mediæval detail in the best days is purer in taste, it is more consistent in reference to an accepted standard; but there is not the variety of fancy which we find in the free play of the Renaissance work. Among special examples of considerable interest as design are the wooden settee from the Museo Nazionale at Florence (Plate xxv.), and the

\* Published for the author by Maclure & Macdonald, Glasgow.

marble pulpit in the church of Saint Annunziata at Genoa, with its elegantly-designed spiral staircase. Other fine examples among the measured drawings are the marble chimney-piece in the Ducal Palace at Venice, with its sumptuous yet delicate detail, and the bas-relief decoration from a pilaster at Sant' Anastasia, Verona.

The reproductions from pencil sketches show a very good and free style of sketching; some of those reproduced from brush drawings are perhaps a little sketchy for publication. Among the lightly worked ones, however, that of the transept of Como Cathedral is exceedingly effective and gives the variety of texture and tone in the walling very well, without pronouncing it too strongly. The ink-line perspective drawing of the Palazzo Prospero at Ferrara, on the other hand, is injured by being over-lined and overshadowed, losing its clearness. It may be pretty confidently affirmed that the complete shading up of a perspective drawing in pen-line should never be undertaken unless there is the intention to take full time over finishing it with careful execution; and perhaps it is a question even then. A completely shaded drawing in line can, however, be made powerful and effective with adequate labour and finish, but not without; a mass of hastily scored lines to give shadow destroys the sharpness and architectural feeling of an architectural drawing.

Otherwise this is a book which subscribers and purchasers may well be glad to have on their shelves, both for its contents and for the sumptuous manner in which it has been got up in regard to paper and type, while the lithographers are also to be complimented on the style of their reproductions, especially of the pencil and water-colour drawings. The frontispiece to the volume is a reproduction from a perspective view by the author of one of Thomson's latest and best-known works, a church in Glasgow, which was one of the drawings by which the travelling studentship was gained. As we have before said, it may be doubted whether the style which Thomson evolved from Greek architecture can be regarded as altogether successful as a style for a northern Scotch city; the buildings already begin to look rather grim and desolate now that their new quality of surface is dimmed; but Thomson was a remarkable individuality in architecture, and his townsmen are quite right to endeavour to keep his memory in honour. What has been called the sincerest flattery, that of imitation, or of an attempt to further develop his style, as far as we have observed, they do not seem to have paid him.

#### NOTES.

THE Railway Commissioners delivered judgment last week in two cases of some importance. In one instance an application had been made for an order for the dissection of certain rates at Preston and Greenbank. The object of the applicant (Mrs. Tomlinson) appears to have been to ascertain what proportion was for terminal services, which she performs for the company as owner of the private station at Greenbank. The London and North-Western Company allow her 9d. per ton for these services, an amount which she regards as insufficient. The Commissioners decided that she satisfied the description of a "party interested" in respect of a part of her application but not the whole, consequently only a portion of the information sought will be gained, while no order was made as to costs. The Commissioners seem resolved to discourage what they term "mere fishing inquiries" as to the composition of rates with a view to enable a person to see if he can discover anything to find fault with; and, although it is not suggested that this application was made with any such idle motive, they considered that the applicant had asked for too much. In the other case, the question at issue had been referred to the Commissioners—in accordance with the provisions of a private railway Act of last session,—as arbitrators, a function



which they do not appear to at all appreciate. Indeed, Mr. Justice Wills stated that he entertained the strongest possible objection to the insertion of clauses in the Special Acts of railway companies, referring points in dispute to the Court in such a capacity, and that he had taken steps which would doubtless effectually prevent their insertion in future. His view is that, if matters are of sufficient importance to be referred to the Commissioners, they ought to be brought before them in their judicial capacity. There is, doubtless, a danger that awkward questions might subsequently arise as to the capacity in which cases were really determined, if this kind of reference were to be at all frequent.

**THE** Pollution of Rivers Prevention Act of 1876 has been almost a dead letter because of the difficulty of inducing District Sanitary Authorities to put it into force; several causes combined to account for their inactivity, — perhaps individual members of authorities were themselves interested in manufactures for the waste products of which the river formed a cheap and useful carrier; perhaps no steps could be taken against manufacturers because the Sanitary (?) Authority itself was chief fouler of the stream by pouring into it untreated sewage; and yet another cause of inaction was the smallness of the portion of river over which any authority had control, and the consequent difficulty of ensuring such concerted action on the part of all the authorities adjoining the river, as would materially improve its condition. But the Local Government Act of 1888 contained a clause which ought to prove of immense benefit to sanitation in this matter of river-pollution: we refer to the clause empowering the various "county" (including borough) authorities watered by any river to constitute a Watershed Board, which will be in a position to deal effectively with the river and its tributaries from source to sea. The advantages of the new scheme are obvious.

**THE** first application to the Local Government Board for power to form such a Watershed Board as contemplated by the provisions above referred to was recently made by the County Councils of Lancashire and Cheshire, but the Local Government Board replied that the issue of a provisional order for that purpose would be facilitated if all the authorities which were to be included in the district would unite and decide upon the questions of representation, payment of expenses, and the like. In consequence of this reply, a meeting was held at the Manchester Assize Courts on Thursday last week, at which representatives were present from the County Councils of Lancashire and Cheshire, and the Corporations of Manchester, Salford, Bolton, Bury, Oldham, Rochdale, and St. Helen's. The borough of Stockport and the County Council of Derbyshire were not represented, although both are interested in the scheme, as some of the tributaries of the Mersey and Irwell are within their districts. The Right Hon. J. T. Hibbert, Chairman of the Lancashire County Council, presided at the meeting, and delivered an excellent speech in favour of the scheme; he referred to the recent death of a young man from typhoid fever, at Partington, Cheshire, about which the medical officer reported:—"The cottage in which the young man lived abuts upon the River Mersey, which here, as elsewhere, has no other appearance than that of an open sewer. The putrid emanations from the river, and especially from the banks left exposed when the water was low, were the cause of the fever." He also pointed out that the death-rate in Manchester was much higher near the river than in other parts of the town, and stated the length of the Mersey and Irwell, with their tributaries, to be about 300 miles. After some discussion the area of the district was agreed upon, and it was unanimously decided that the board consist of twenty-five members, and that the rateable value be the basis of representation. It

is certainly high time that steps were taken to lessen the filth in these Lancashire streams, and we wish immediate success to the combined authorities in their present application for power to form a Watershed Board, and trust that they will soon be able to make so much improvement in the state of the rivers of their district, that authorities in other parts of the country may be induced to follow their example.

**WHAT** is a "story" of a house? Is it necessarily a space enclosed within four vertical walls? This was the question propounded to the Queen's Bench Division in *Foot v. Hodgson*. The answer which the Bench gave to the question, and which may be found in the current number of the "Law Reports," is that a story need not necessarily be a space within four vertical walls,—one side may consist of a sloping roof. The point arose under the Metropolitan Building Act, 1855,—rule 6, in the schedule of the Act, speaking of "the topmost story," in reference to certain measurements. Surveyors appointed under section 85 of the above Act rightly thought that an attic might be a "story." On appeal to the Judge of the City of London Court, the latter thought that an attic was part of the roof, and not a "story." The Queen's Bench Division have, it will be seen, reversed this judgment, and, as it seems to us, with justice. "It would be unfortunate if such rooms as these were excluded from the important regulations of the schedule." These are Mr. Justice Grantham's words, and we agree with them. But it is also obvious that a "story," in ordinary language, means a space capable of being used as a room. A mere cupboard in the roof would not be a "story," but an attic, we cannot doubt, is a "story."

**THE** case of the Mayor and Corporation of Salford v. Lever, decided last week by a Divisional Court of the Queen's Bench Division, is very satisfactory in the interests of commercial morality. It arose out of the now notorious Salford gas frauds, and was an action by the Corporation against a coal merchant, who had, through Hunter, the gas manager of the Corporation, obtained contracts for supplying coal at one shilling per ton above the market price. This one shilling per ton was to be given back by Lever to Hunter as the price paid for obtaining the contract. The action was to recover this sum from Lever. It is now well recognised law that secret commission received by an agent contrary to his duty can be recovered back by the principal from the agent. But in the present case the judges have gone a step further and held that the principal can recover from the contractor the excess price which the latter receives over the market price either as damages for a fraud committed against the principal, or, in legal parlance, as money had and received to his use. Therefore, the practical result of the case is that those who give bribes to an agent in order to obtain contracts from his principal may at any moment find themselves mulcted in damages for so doing. Of course there will be found men who will run this risk, nevertheless there can be no doubt that this decision is a blow to dishonest commercial transactions. A question also arose as to the legality of an agreement between the Corporation and Hunter after the frauds of the latter were discovered. But this part of the case was not of the same general importance as that which we have noted above.

**DURING** the consideration of the Housing of the Working Classes Act Amendment Bill by the Standing Committee of the House of Commons on Law, on Monday last, an amendment to Clause 4 (demolition of obstructive buildings) was proposed by Mr. Ritchie and accepted, to the effect that a building which stops the ventilation of other buildings or conduces to make them dangerous or injurious to health shall be deemed obstructive. This is a very wise amendment,

which would admit of a more extended application.

**MR. T. H. BICKERTON**, oculist to the Liverpool Infirmary, has issued a pamphlet on colour-blindness and defective eyesight in sailors, with a view to inducing the Board of Trade to adopt more accurate tests for such defects than those it employs at present, and which he, in common with all our skilled authorities on the subject, considers worse than useless. The importance of the possession of a normal colour-sense by persons engaged in regulating traffic at sea and on railways by coloured flags and signal-lamps is obvious to every one, but the official mind seems to be remarkably obtuse in this respect, and looks on colour-blindness as a mental eccentricity rather than a serious physical defect of the body. Careful statistical observations show that among men one individual in twenty-five is colour-blind; so that most of us must have a colour-blind person among our acquaintances whose defect has escaped his and our own detection, showing the need there is for the adoption of a scientific rather than what is called a practical test where life is at stake. The necessity for the adoption of proper tests was pointed out by Dr. Wilson, of Edinburgh, as far back as 1855, three years after the adoption of red and green lights on ships, and has been urged again and again since then by many of our leading oculists at the Society of Arts and in the press. Fortunately, the Board of Trade has at last yielded so far as to request the Royal Society to advise it on the subject, and a committee, with Lord Rayleigh as chairman, is now investigating the matter; and there is also a committee of the British Medical Association employed in like manner. If further encouragement were necessary, Mr. Bickerton's arguments and recorded cases of grave accidents resulting from colour-blindness and imperfect eyesight at sea will supply it. The whole subject has, however, been well thrashed out, and the proper tests and the mode of applying them are perfectly known to the specialists, and can be easily acquired by novices, so there is little excuse for further delay in their adoption by the authorities. As might be expected, some of the larger steamship companies have asked the Government a good example in this respect by adopting the most approved methods of eliminating from their service all officers and men with defective vision.

**IN** answer to a question from Sir J. Lubbock on Monday evening, in regard to the state of Ennis Abbey, Mr. Jackson (for the First Commissioner of Works) stated that Ennis Abbey was not one of the structures vested in the Board of Works of Ireland for preservation as a national monument, and that such structures did not come under the Ancient Monuments Protection Act. That they do not seems to be mainly the fault of Sir John Lubbock himself, who drew up the Bill on such lines as to confine its operation to pre-historic monuments. We have always been of opinion that this was a mistake, and perhaps Sir J. Lubbock is beginning to find this out.

**SIR JOSEPH BAZALGETTE'S** new Battersea Bridge will, it is stated, be ready for use in the course of this month. In May, 1886, the late Metropolitan Board of Works ratified a contract for 143,000, with Messrs. Williams, Son, & Wallington.\* On June 18, of the following year, the Duke of Clarence and Avondale laid the memorial stone (his first public function of that kind), and also opened the new suspension bridge at Hammersmith. The mallet and plumb used on that occasion had been made from an oak pile of the earlier bridge. Old Battersea Bridge had been pulled down in the winter of 1885-6, by Messrs. Mowlem & Co. It was

\* For an account of the structure see the *Builder* of August 11, 1888: meetings and visits of the Association of Municipal and Sanitary Engineers and Surveyors.







charged with the instruments of the Passion and other subjects. One bears three chalcies and as many wafers. There is a late, square-headed, two-light, low side window, much mutilated and blocked. The tower is of mellow red brick, capped with a grey stone spire.

The next church, Long Sutton, a large and stately edifice, 127 ft. in length, also, like Tydd, exhibits externally a Decorated and Perpendicular shell, containing a singularly beautiful arcade and clearestory of Early Transitional date. In the Decorated period, as was usual in this district, very wide aisles were added, much loftier than those they supplanted, entirely concealing the clearestory from outside, and (a later clearestory of very base design having been superimposed) converting it into the semblance of a triforium. The continuous shafted external arcade is to be seen within the aisles, above the nave arcades. Within, the clearestory is not continuous, to the great loss of dignity, only the centre light of each bay being pierced, and set in a somewhat heavy shafted arch. In the second bay from the east, on the south side, this arch has been much widened in a very clumsy fashion, the reason probably being to throw light on an altar in front of the roof screen. The debased clearestory added in the last century by one Mr. Allen, whose knowledge, — or that of his architect, — was not commensurate with his liberality, is about to be replaced by one designed more in harmony with its surroundings, by Mr. Basset Smith. The long wide aisles, sweeping unbroken almost to the east end, add great dignity to the interior. They open into the chancel by two arches, flattened on the north, sharply pointed on the south, rising from uncomfortably tall, lanky octagonal shafts standing on high bases — a piece of decidedly awkward design in this otherwise fine interior. The most remarkable feature of the building is the Early English tower and spire, the whole of one date, all but detached, and only touching the nave at its south-west corner of the widened aisle. This is described by the late Mr. Edmund Sharpe as "one of the earliest and most remarkable designs of the Lancet period in the kingdom, and especially valuable as one of the very few of our early towers which, having escaped fire and decay, shows how they were originally finished." Originally, when this tower stood clear of the church, on four open arches now blocked, its dignity must have been much enhanced by its isolation. But it is still a most noble steeple, with few rivals in the country. Each angle is strengthened by an octagonal turret, finishing with a tall spirelet, leaning over towards the central spire, as though it were to clasp it in their embrace, and, like it, formed of wood covered with old grey lead. This church also possesses another remarkable feature in the small octagonal vestry of two stories, with a stone pyramidal roof, which projects from the north-east angle of the chancel. The lower story is vaulted in red brick with stone ribs; the upper chamber is also groined, and has a window-slit looking into the chancel. The adaptation of the responds of the chancel arch when the Perpendicular chancel was erected, has caused some curious alterations. The church has been well restored, and is evidently lovingly cared for. Some rich stone sedilia, with elaborate canopies, have been set up in memory of the late rector, and a chancel-screen with cross are in preparation. The two side windows of the sanctuary are filled with excellent stained glass by Messrs. Burlinson & Grylls, to which the glaring, crowded Crucifixion in the east window forms a painful contrast. The windows of the south aisle exhibit some beautiful old glass, especially a full-length figure of St. George.

Lutton, a short distance to the north, is a good example of a brick church. The whole fabric, which is of no great size, with the exception of the stone spire, is of this material. Even the shafted piers and moulded arches are of brick coated with plaster, a fracture here and there in the casing betraying what is behind. The fabric itself is Late Decorated, showing good flowing-tracery windows in the chancel, with Perpendicular aisles and continuous clearestory and western tower. The fifteenth-century wooden tie-beam roof is of singular delicacy and beauty. The beams are finely moulded, each supported by figures enshrined in a niche between the clearestory windows. The belfry-arch is of fine proportions, the mouldings dying into the splayed piers.

Gedney is a church of magnificent propor-

tions and rich detail. It owes its dignity chiefly to the excellent design of the west tower, — rich Early English in the three lower stages, with a tall Perpendicular belfry story, with two lofty transomed and canopied windows on each face; the lofty Perpendicular clearestory of twelve three-light windows, placed close together, crowned with a battlemented parapet and numerous small pinnacles, and the noble Early Decorated chancel, plain but majestic in its simplicity. But this grand church has been much neglected, and its forlorn and dilapidated condition cries loudly for the hand of a conservative restorer. Happily, this much-needed work has just been partially begun, through the munificence of Dr. Bellamy, the President of St. John's College, Oxford, who is a large landowner in the parish. The south aisle is already under repair, and it is to be hoped that the work, once set on foot, will be continued, and embrace the whole edifice. Immediately before the visit of the Society the removal of the high box-pews with which the whole interior has been cumbered, brought to light a very fine brass of a lady, of the end of the fourteenth century, beneath a triple canopy, with the Apostles in niches on either side, on a slab 8 ft. in length. These last have unfortunately perished, but the effigy is still good. The interior is rather disappointing after the stateliness of the exterior. The tallness of the octagonal shafts of the Decorated arcade and the width of the arches, together with the breadth of the aisles, creates an impression of bareness, which is increased by the slightness, almost amounting to emaciation, of the otherwise rich and elaborate tie-beam roof, which also, it may be added, is in grievous need of thorough repair. The east window of five lights is a beautiful specimen of reticulated tracery. There are magnificent remains of a Jesse window in gorgeous coloured glass at the east end of the north aisle, and some equally good but more scantily relics in the side windows, and there is a fine tall light chancel screen. The pulpit standing against one of the north piers of the nave, is a noble example of the grand three-deckers with spreading sounding-board of the Georgian period, which, we hope, will be retained untouched in any restoration of the church. It is far more dignified than anything our modern architects usually design. Strange to say there is a modern pannelled stone altar and stone altar-rails, both by no means good. In the south wall of the chancel there is a square-headed two-light low-side window like the mutilated example at Tydd. We must not omit to mention that a lofty spire was intended, of which only the base was built, on which a small lead-covered spirelet was subsequently set up. The east face of the tower, with the three weather-mouldings, one above the other, tells of the gradual growth of the fabric with unmistakable distinctness.

Fleet, at a very short distance from Gedney, is another very imposing church, remarkable for one of the detached towers characteristic of the marshland. This tower stands perfectly clear of the church, some 12 ft. to the south-west. It is a plain composition of Decorated date, surmounted by a spire. The outline is picturesquely broken by a bold staircase turret at the north-east corner, ending in a spirelet. Within the battlement are small pinnacles, from which spring pierced flying buttresses to the spire. This church has suffered greatly from the destruction of the original roof, which has been replaced with a barn roof of the coarsest construction at a lower level, completely spoiling the effect of the building both from without and within. We were glad to hear that a new roof was soon to be begun. The Early English arcade is sustained by cylindrical piers of somewhat too slender proportions. The chancel is Decorated. It was designed for side aisles, which were never built, the work being probably suspended by the Black Death. The arches appear in the walls, framing the aisle windows, and a blocked doorway in the eastern buttress of the south aisle of the nave affords a curious evidence of the intended continuation of the wall eastwards. The stonework, like that of nearly all the churches visited, is excellent, and the gabled buttresses ending in knobs of foliage, and the fine base-moulds, give great dignity to the whole building. With a new and appropriate roof its effect will be admirable.

Returning to Holbeach, the starting-point, luncheon was taken and the church visited. This has hardly any rival in a district famous for its spacious and magnificent churches. Its general effect is increased, though its histori-

cal interest is diminished, by its being entirely of one date, rather late in the Decorated period, with the exception of the western tower and spire, which are very Early Perpendicular. The windows are nearly all of flowing tracery, chiefly of two patterns, not conspicuous for gracefulness. The east window, of four lights only, is too small for its position, and sorely needs stained glass. The clearestory, of fourteen two-light windows on each side, set close together, sweeping from end to end, is a beautiful feature, but it rather suffers from want of height. The arcade of seven bays with tall, clustered piers on high bays, is of singular stateliness. The timber roofs are new throughout, designed by Mr. Christian, and certainly deserve high praise.

In so spacious a church, with so many large windows, the entire absence of stained glass is much felt. A chancel-screen is also greatly wanted. The seating is costly and good. The pulpit, also designed by Mr. Christian, is a very elaborate and costly work. The lower stage of the west tower, opening into the nave by a fine arch, has on each of its three sides a large window of singular and, we must add, of very ungraceful design. It may be described as a window set within a window, the whole being of five lights, the inner window of three, divided by vertical mullions without any tracery or cusplation. These mullions and that which bound the entire arch, are carried up vertically to the outer arch, the intervening spaces being fashioned into trefoils and cinquefoils. As an example of the passage of Decorated into Perpendicular the design is interesting, but it certainly does not deserve imitation. Both the porches are remarkable compositions. That to the south has an outer arch of a very narrow and acute form, rather awkwardly squeezed up under a flatish gable. The inner doorway has exquisite Decorated mouldings. The north porch is so unlike ecclesiastical work that it has been suggested that it was not originally designed for its present position, but was brought from a destroyed manor house in the vicinity. The outer doorway, with rich, hanging tracery, is flanked by massive cylindrical turrets, one of which contains a novel stair leading to the room above; the other appears to have been used as a porter's lodge. At the west end is a rich shallow porch, with a groined roof and canopy running up above the window-sill. The altar tomb of Sir Humphrey Littlebury, born 1346, is a magnificent work. The recumbent effigy is of great size and fine workmanship. The head rests on a tilting helm, having as crest the singular device of a man's head (a Blackmoor's?) enclosed in a net. The canopied recesses along the flanks are of very unusual depth.

Whapload, the church next visited, proved one of the most interesting of the whole two days' excursion. It has been reduced to a half-ruined state by long-continued neglect or barbarous usage. The roofs have been lowered throughout, leaving the gables gaunt and bare, protesting against their mutilation. Nearly all the windows have been robbed of their tracery, and otherwise disfigured, while the mean repairs of the chancel and north transept (the latter being converted into a school-room with a red brick chimney run up through the centre of the great window) have robbed them of almost every trace of antiquity. The church is to be restored by Mr. Pearson as soon as funds can be raised; it is to be hoped this will not be carried to the length of making a new church of it. The earliest part of the church, which is 150 ft. in length, is of Late Norman. Of this date we have the enriched chancel arch and the first four bays of the nave. The piers are partly short, stout cylinders, partly compound piers, bearing arches of disproportionate width and slightness, leaving too much of the upper surface of the capital unoccupied. The clearestory externally shows a continuous circular-headed arcade, pierced at intervals for windows, with, originally, a corbel-table above. The three western bays of the nave are of Late Transitional date, on the same general plan as the Norman part, but with very instructive points of contrast. The west front, in which the Early English style reigns uncontrolled, must have been a very vigorous composition. The west doorway is a fine specimen of the style in its greatest purity. The richly-moulded soffits rise from a

\* By the "Ordination of the Vicarage," on the appropriation of the revenues of this and other churches to the Bishop's Table, in 1340, the Bishop was ordered to completely rebuild the chancel de novo. This gives us the approximate date of the fabric.



double row of eight detached shafts on each side, set one behind the other, with capitals of foliage. The tower, four stages in height, occupies an unusual position, as a kind of southern transept. It is a very striking design, the three lower stages Early English, with attached arcades; the fourth story Decorated, with a battlemented parapet. At the west end of the south aisle is a very fine altar tomb, under a classical canopy supported by ten pillars, of the early part of the seventeenth century, bearing the effigies of St. Anthony Irby (d. 1593) and his wife Elizabeth. The excellence of the sculpture led the late Mr. Matthew Bloxam to attribute them to Nicholas Stone.

Moulton Church is a very fine edifice, its leading portions being of very late Transitional date, with widened Decorated aisles, and Perpendicular chancel, but its most striking feature is the noble western tower and spire, of the earliest years of the Perpendicular period, the exquisite proportions of which are absolutely unsurpassed. It gains much by being all of one design, *d'un seul jet*; battering gradually from the moulded base to the summit. The spire is of precisely the right height and diameter for harmony of effect, and is happily united to the pinnacles by well-proportioned flying buttresses. The arcade has pointed arches of two splayed orders. The piers are partly circular, partly clustered, the capitals displaying a series of stiff engaged leaves, all inclined one way. The two sides of the clearstory differ. That to the south has round-headed arches, and is not quite continuous. That to the north exhibits pointed arches and is continuous. The interior abounds in battlemented brackets projecting from the walls and piers, once bearing images. There are singular traces of an altar, with piscina and bracket, in the sill of a window of the south aisle, immediately to the west of the south porch.

The first day's excursion closed with Weston St. Mary, a lovely little gem of pure Early English architecture, with Decorated transepts and Perpendicular west tower. The piers are low, and shafted with capitals of stiff foliage, surmounted by the sweeping circular abacus common to the district. The clearstory is not continuous; it has small lights shafted externally, one between each two of the nave arches. The chancel arch is of admirable proportions. The chancel itself has tall single lancets in the side-walls, and three unequal lancets in the east wall, all divided by tall, slender buttresses. The east gable, with its recess, belongs to the first restoration, carefully carried out by its former vicar, the late Prebendary Moore, vicar of Spalding. We agree with Mr. Sharpe in deeming it "one of the best examples we have of the east end of a small parish church." The restoration was carried to a conclusion, including the raising of the nave roof to its original pitch, under Mr. Pearson's directions, by the retiring vicar, the Rev. E. M. Sanderson, vicar of Hyniton. The south porch is of much dignity. Within, each wall shows an arcade on detached shafts. At the entrance are the red granite memorial slabs of Prebendary and Mrs. Moore. The Early English font is of great dignity. It stands at the west end of the nave, on a high octagonal flight of steps, with a broad platform for the priest. The octagonal basin bears conventional Early English foliage on each face. The modern glass in the chancel windows is excellent. Altogether Weston is a delightful example of a small sober parish church of the best style of English architecture.

The second day's excursion took the Society across the border into Norfolk. The churches visited were Terrington St. Clements, Walpole St. Peters, "the Lady of Marshlow," West Walton, Walsoken, and the Cambridgeshire church of Wisbech. The space allotted to us forbids our attempting any description of these churches. Suffice it to say that they are among the largest and most magnificent examples of ecclesiastical architecture anywhere in England. All having been sufficiently, but, as a rule, not too much restored, with one lamentable exception, are in good condition. The exception is West Walton, the forlorn and dilapidated condition of which called out the indignant protests of the members of the Society, with expressions of astonishment that the parochial authorities, especially the rector of the church (the living stands in "Crockford" at 1,374., and 1,132. net), and the parishioners generally, should tamely allow the priceless inheritance received from the piety of their forefathers to

sink into ruin without a sustained and vigorous effort for its preservation. The roof is in an unsafe and leaky condition, the light shining through in evening, and its walls are bulging, cracks are opening, and it looks as if it only needed a strong wind, such as often blows across these exposed marshes, to bring the whole to the ground. We earnestly hope that the visit of the Lincolnshire Society may lead to vigorous action being taken towards its repair. The first step to this would be to call in some experienced architect to report on the condition of the church, and the sum required for the substantial repair needed for its preservation from inevitable destruction. If the architect were to counsel the entire removal of the inordinately wide and high north aisle, so unhappily substituted in the Decorated period for the original narrow Early English aisle, and the restoration of this latter, whatever the Society for the Preservation of Ancient Buildings might say, we should accept this counsel as sound. This aisle has now lost every architectural feature, and has become a mere ugly lean-to shed, utterly destroying the proportions of the church, and blocking-up and all but entirely hiding the fine Early English arcaded clearstory. The south aisle is also unhappily wide, but it preserves its old windows, some of which are of great beauty. The detached Early English bell-tower, standing, like those at Evesham and Bury St. Edmunds, as an entrance to the churchyard, is probably the most beautiful example of this arrangement, so unusual in England, to be found anywhere. In its proportions, its design, and its detail it is as near perfection as possible. We hope its substantial repair may be much better than that of the church. But neglect is a spreading evil, and solitary examples of it seldom occur.

It is an interesting evidence of the prevalence of a local fashion that while detached bell-towers are generally so unfrequent with us, this corner of England should show as many as four towers completely detached.—Tydd St. Giles, Fleet, Terrington, and West Walton,—and two others, Long Sutton and Wisbech, virtually so. There is a similar group in Herefordshire, seven in number,—viz., Ledbury, Evesbury, Garway, Holmer, and Richard's Castle, and the dove-cote-like erections at Pembridge and Yarpole. Other examples occur at Berkeley, East Dereham, Beccles, Kirkoswald, Brookland, Warmworth, and other places, especially Chichester Cathedral, New College, and Magdalen College, Oxford. The *raison d'être* of these isolated campanies has yet to be fully investigated. At Wisbech the detached tower was erected in late Perpendicular times, when the original western tower at the end of the Transition nave had fallen and crushed the southern arcade, for which a singularly slight arrangement of slender piers and wide arches was substituted. One other peculiarity may be mentioned. At Walpole St. Peter's, the eastern bay of the magnificent chancel, one of the noblest examples of Perpendicular in its earliest and best form, is elevated considerably above the general level, and the altar is reached by a lofty flight of steps, which, on our visit, were ornamented with greenhouse plants. This arrangement was rendered necessary by the existence of an old right-of-way through the churchyard passing by a groined passage beneath the chancel.

#### PLAS NEWYDD, LLANGOLLEN.

AMONG the many interesting country places which are announced as about to pass under the auctioneer's hammer, few enjoy more pleasant associations than Plas Newydd, the romantic home of those two famous recluses, the "Ladies of Llangollen."

Llangollen is a very lovely old town, situated on the river Dee, on the borders of Denbighshire and Merionethshire. It is a railway-station on the line between Wrexham and Bala, and a well-known haunt of the brethren of the angle; and fifty years ago or more it was one of the places where the Royal mail between Shrewsbury and Holyhead always stopped to change horses. It nestles on a slope at the foot of the Berwyn Mountains, which rise on the south and west, and the cloud-capped summit of Dinas Bran frowns down upon it from the north. Three miles off to the north-west are the well-known ruins of Valle Crucis Abbey.

Being on the high road between Dublin and London, it is no wonder that the charms of the Vale of Llangollen should have arrested the attention of many of the sons and daughters of

the sister isle. Some hundred and twenty years ago this had been the case with the Lady Elizabeth Butler, a native of Kilkenny, a sister of the Earl of Ormonde, who had travelled through it on her way to be presented at Court at St. James's; and when, a few years later, she formed a romantic friendship with the Hon. Miss Ponsbury, the daughter of a neighbouring squire, the two fair ladies eloped together from their homes in the south of Ireland, and resolved to fix their tent here. A small cottage on the crown of a hill, in the upper part of the town, with a few acres of ground, as it happened, was to be "sold or let." The place had a pleasant aspect, and commanded fine views. They took it at first on a short lease, and afterwards they bought the freehold. Horace Walpole had lately made Strawberry Hill famous by converting it into a semi-Gothic mansion, and filling it with knick-knacks from Italy and Spain; and Lady Elizabeth and her friend resolved that "Plas Newydd," as they named their house, should be equally famous as a semi-Gothic cottage. They saw that the Gothic taste was becoming a popular "fad," and they resolved to be beforehand with it.

Accordingly they enlarged the little house by additional rooms on the ground-floor, and by building two sleeping-apartments above. These they adorned with panels of old oak, partly Ecclesiastical and partly Classical in pattern; and they surrounded their unpretentious dwelling with an ornamental wooden palisade. They laid out their garden with taste and skill, and on the opposite side of the roadway they constructed a dairy, in a little grove or shrubbery, which they called after the Duke of Wellington's name when he came to see them during one of his visits to Denbighshire, while staying with his relatives, the Trevors, Lord Duncannon, at Brinknall, a few miles off.

Plas Newydd, like Strawberry Hill, now became, through the fame of the fair recluses and the mystery in which they enshrouded themselves, quite an object of pilgrimage in the western counties. But the ladies were shy of admitting strangers; indeed, they refused to see visitors unless they wrote to them beforehand to announce their intention of making a call, or asking permission to do so. This gave them time to prepare their rooms, and to perfume them with pastilles, which "they kept in bronze censers."

Among their visitors were Lord Castlereagh, the unfortunate Lord Edward Fitzgerald (when a price of 1,000*l.* was put on his head for his share in the Irish Rebellion of '98) and his wife Pamela, Madame de Genlis and her pupil, Mlle. d'Orleans, Bishop Heber of Calcutta, the poet Wordsworth, and the Duke of Wellington.

The ladies wore a decoration of which they were very proud, a blue sash with the harp and crown of Erin, given to them by a Lord-Lieutenant of Ireland; and others conferred on them by the Duke of Orleans.

Down to 1810 they held their cottage on lease, but in that year their old Irish servant, Mary Carry, died and left them her savings, with which they purchased the freehold. The faithful creature was buried in Llangollen Churchyard, and the ladies raised over her remains a stone monument with three sides, on one of which they placed her epitaph, inscribing the other sides with their own names, and leaving vacant spaces for the dates of their deaths. The ladies survived her twenty years, dying respectively in 1829 and 1831.

In 1832 the place was brought to the hammer by George Robins, who held an eight days' sale of their effects, when many of their cherished treasures were bought by friends and neighbours as souvenirs.

The house itself, by the irregularity of its construction, tells its own tale. It is simply a cottage enlarged by successive additions till it has reached the size of a country rectory or vicarage. It originally comprised only three or four rooms on the ground-floor, to which the ladies added two small bedrooms on an upper story. Then they erected a "vestibule" with an outer and inner doorway, and an "ante-room," in which they took their meals; and they placed two fixed oak settees in the porch, so that they could sit after dinner and take tea or sip coffee out of doors. The porch is made almost entirely out of old oak from the churches of Llantysilio and Llangollen, mixed up with grotesque carved heads of Queen Anne's time from Northumberland House in the Strand. This and most of the other oaken fittings were put together by native workmen. This porch still stands perfect in all its details.



The "Oak Room" is so called from carvings which cover the walls, the intervals between each being filled up with richly-embossed leather of the sixteenth century. In it are two curious seats or "thrones," the one called the Confessional Throne came from a Spanish monastery. It bears a figure with a mask with open mouth and ears for communication between the priest and his penitent. The other, or "Washington Throne," equally quaint in its adornments, is so called because it is made out of an old oak tree at Sulgrave, in Northamptonshire, the residence of George Washington's ancestors. The window recess is panelled with oak taken from the pew in Llangollen Church, in which the ladies sat Sunday after Sunday, and is diversified with a classical sculpture, "The Flaying of Marsyas," and by the bronze handle of the ladies' alarm bell. The rest of the room is adorned by heads of Leicester, Queen Elizabeth, and the Earl of Leicester, a portrait of Mary Queen of Scots on panel, allegorical devices, paintings on copper, bronzes, ivory statuettes, cameras and carvings in alabaster. Here also are the footstools, fire-screens, glass vases, and wooden candlesticks used by the "ladies of Llangollen," and specimens of their needlework in gold and silver thread. The room is little altered from what it was sixty years ago, and the ladies' hat-pegs and coat-pegs still remain *in statu quo* in the vestibule, though the hats and the long coats are gone.

The staircase is a mass of carved oak, of various dates and styles, and it is surmounted by a very handsome reeded, probably taken from some church on the Continent. On the handrail are sculptured a lion, a squirrel, and a mermaid; a panel close by bears the date 1192; but this date may be questioned.

The ante-room on the ground-floor, in which, as already stated, the ladies dined, is now filled with antique furniture, carvings, paintings, and other curiosities of a very miscellaneous character; but many of these have been added since their time. Amongst other curiosities are some steel gauntlets of the time of Richard II., some javalins of the fourteenth century, a bronze stirrup and spur of Cromwell's day, an old "Bow-street runner's" staff, a Dutch ale-wife's scoring-board, some porcupine work-boxes from Ceylon, and three beautiful pieces of needlework in gold, silver, and silk, of the seventeenth century. These are very elaborate, and each bears the silkworm as an emblem for industry; of the snail, for thrift; and of the butterfly, for joy. It may be added that these pieces were for a long time on loan at South Kensington, and were thought by judges not to be surpassed in workmanship or in design. One of them represents Charles I. when Prince of Wales, with Henrietta Maria holding for "loving-cup"; and another, guests waiting for a syllabub-party. The milk, the wine, the bowl, the fruit, and the figures are all wonderfully depicted by the needle. Of the carvings and paintings on the walls, some belonged to the ladies, but others are more recent acquisitions.

The library, which in the time of the ladies was called "The Salon of Minerva," contains a few books and a variety of oil-paintings, of which the most remarkable are "The Owl Preaching Wisdom to the Forest and Flood" (1690), and a large oil-painting by a Welsh artist, named Williams, representing George III. and his Court in Kew Gardens, with the future King, William IV., riding on a dog. There are also to be seen some fine specimens of embroidery in worsted, silk, and satin; and a large collection of carvings in ivory by the last owner of the property, General Yorke, C.B. The tables, the window recess, the shelves, and the cabinets of this room are all filled with curiosities and knick-knacks, to most of which some history is attached.

Lady Eleanor Butler's bedroom remains much as she left it more than sixty years ago. There are the huge tiger-skin made up into a rug; the table-cover of rich tamar-work of the sixteenth century, in white silk; the figures of two ladies carrying the armorial bearings of the Ladies of Llangollen, presented to them by an artist in the town; a carving knife and fork, hatted with wood from Old London Bridge; and two "smoothing boards," for folding up the frills worn by ladies and gallants in the days of Queen Elizabeth. Of Miss Ponsonby's bedroom there is little to be said, except that it is adorned in the same eccentric manner, and that it remains very much in the same condition. Nearly all the windows are filled with painted

glass, some old and good, but more modern and poor.

But it must not be supposed that the exterior of Plas Newydd is unworthy of description. On the contrary, the porch and front door deserve special notice. The outside, as well as the inside, is rich in old oak. The entrance is supported by bed-posts of the time of Charles I., worked deftly into the surrounding woodwork, and bearing the royal arms and texts from sacred and profane sources, warning against all excesses. On the door are carved the emblems of the four Evangelists and other sacred subjects, and by their side are Indian and other Oriental carvings. The frieze is also a true type of the exquisite taste of "the ladies," who were perplexed for years to find a match for the "cat and acorns" till they completed their panel by a "little dog and cakes." On each side of the porch are windows richly canopied with oak carvings, which represent a variety of Eastern, and especially Hindoo, ceremonies—the gifts, it is said, of Harriet, Duchess of St. Albans. Over the Gothic windows is a small tablet, erected by General Yorke to the memory of the two ladies.

On the lawn in front of the house are two ancient stone fonts, the one from Llangollen Church, and the other from Valle Crucis Abbey. In the Rockery is a monk's head, and also a stone coffin-lid, both from Valle Crucis. Near to the Rockery is the Ladies' Bird-cote, and this is the only part of the entire property which is out of repair. In fact, it is speedily falling to decay.

On the road-side wall is a portal composed of old oak from Llansybil and Llangollen Churches; and the gables of the house are decorated with five "Emblems" of the Crown in the time of Charles I. They came from St. Thomas's Church at Newport, near Carisbrooke, in the Isle of Wight.

On the exterior is painted a variety of quotations from the poets in praise, or at all events in celebration of, these ladies and their home. The best known of all, perhaps, though the best worth quoting here, are the lines written by the poet Wordsworth, during a visit which he paid to Llangollen in 1824. They run as follows:—

A stream to mingle with your favourite Dee,  
Along the vale of Meditation flows;  
So styled by those fierce Britons, pleased to see  
In Nature's face th' expression of repose.  
Or haply there some pious hermit chose  
To live and die, the peace of heaven his aim;  
To whom the wild, sequestered region owes  
At this late day its sanctifying name.

Glyn Cyfeillgarwch in the Cambrian tongue,  
In ours, "The Vale of Friendship," let this spot  
Be named; where, faithful to a low-roofed cot,  
On Devon's banks ye have abode so long,  
Sisters in love, a love allowed to climb,  
Even on this earth, beyond the reach of time.

It may be interesting to record the fact, although scarcely to the credit of the fair recluses, that "the ladies," so far from being pleased with the lines of the poet who sought to immortalise them, resented his description of Plas Newydd as a "low-roofed cot," and never asked or allowed him to repeat his visit.

The place, having been for some years or more in the hand of new owners, was bought, in 1876, by General Yorke, C.B.—a Balaklava hero, and a member of the ancient house of Yorke of Edding, Denbighshire, who spent large sums of money in repairing the place and adding to its treasures, and whose death in the early part of the present year has forced Plas Newydd again into the market. It was he who added close to the entrance-gate the lines from Keble's "Christian Year"—

"Since all that is not Heaven must fade,  
Light be the hand of ruin laid  
Upon the home I love."

#### COMPETITION.

KENSINGTON INFIRMARY ENLARGEMENT.—The Kensington Guardians, with the assistance of Mr. Thomas Worthington, F.R.I.B.A., of Manchester, as assessor, have selected from among the designs sent in for the proposed enlargement of the Infirmary in the Marlow-road, Design A, sent in by Mr. T. W. Aldwinckle, for the first premium, and that sent in by Mr. Delissa Joseph, for the second premium.

RAILWAYS IN PERSIA.—The Standard says that an English engineer recently passed through Tiflis on his way to Persia, under orders to negotiate with the Government about the construction of railways in that country.

#### THE ARCHÆOLOGICAL CONGRESS AT OXFORD.

THE forty-seventh congress of the British Archaeological Association was opened on Monday last, July 7, at Oxford, by the Earl of Winchelsea and Nottingham, acting in the place of the late Earl of Carnarvon, who had kindly undertaken to preside over it, but was prevented by the illness which terminated in his death. In spite of the unpromising state of the weather, and of the absence of the Association's general and learned secretary,—Mr. Loftus Brock,—a fair gathering of members and friends assembled on the occasion, amongst whom were Sir Arthur Hodgson, Colonel Lambert, Mr. George R. Wright, Mr. W. De Gray Birch, Dr. Phéne, the Hon. George Brodrick, D.C.L., Mr. E. G. Bruton, the Rev. G. N. Freeling, and Mr. E. Walford, M.A.

At two o'clock the members were publicly received in the Council Chamber of the Town Hall by the Mayor of Oxford (Mr. J. Hughes), the Sheriff, the Town Clerk, and other members of the Town Council, the Vice-Chancellor of the University, Dr. Bellamy, and the Warden of Merton College, &c. The Mayor, in a very brief speech, introduced the Earl of Winchelsea to the meeting, remarking, however, that it was hardly necessary to do so, as he had already presided over the Congress held last year at Lincoln. On the part of the Mayor and Corporation of Oxford, and of his fellow-townsmen, he offered the entire party a hearty welcome to the ancient city, and had no doubt that the University, whose chief officer was present, would do no less. In conclusion, he expressed a hope that the gloomy weather would pass away, so as to make their Congress a pleasant one.

The Earl of Winchelsea and Nottingham, as acting president, said his first duty was to tender the warm thanks of the Association to the Mayor for the kind welcome he had accorded to them, and also to the Vice-Chancellor. He was aware there was a very ancient strife between the two bodies, but they were glad that they were now united, and that the only strife remaining was in the form of a generous emulation to see who could do the most for the well-being of all and for the restoration of those buildings which were the equal glory of the City and of the University. They had to lament the death of an honoured statesman whose place he had been called on unworthily to fill. Lord Carnarvon was High Steward of the University of Oxford, and all would deeply deplore his loss. He began his career at Christ Church, where he worked hard, and obtained a first-class. In 1859 he was appointed High Steward, and he had maintained that position until his death. It would be out of place for him there to refer to his political career except in one particular; the work he had done in promoting the Bill for the confederation of the North American Colonies, which gave them the Dominion of Canada. If he might point to one thing which would make Lord Carnarvon's memory green to posterity, it would be that he possessed many high qualities, and all of rare excellency. Lord Carnarvon was able in an age when party politics ran high to keep an unerring rectitude by the light of his conscience. He was able in an age when respect given to rank was only grudgingly given to keep the affection and respect of his tenants, and to his other qualities must be added a scrupulous regard for religion. The occasion when thirty years ago Lord Carnarvon had presided over a congress, and the address he had then given, was still fresh in the memory of those who heard it. He would not attempt to follow where Lord Carnarvon would have led, but it would be less than his duty if he did not mention one or two things, more especially as they would probably find the Bodleian Library, where they would find no more interesting collection of MSS. than those bequeathed by an ancestor of his own, and called the Hatton MSS. He had been suddenly seized with a great interest for the ruins at Stanton Harcourt, and studied them with a fair guide who afterwards became his wife. They would not see the ruins under the same interesting circumstances, but then would there a kitchen—even a kitchen dating back to 1100—had a halo of romance about it—which was one of the most interesting in England, and had been in the family of Harcourt since 1100. It was well worthy to be looked at, and stood alone with Glastonbury, and remained that day



as perfect as the day it was built. There was also Pope's tower, where he wrote some of his poetry, and the church, too, was of great interest. With regard to the ancient history of Oxford little was known of it in Roman times, but in Saxon times it became a place of first-rate importance from its position, commanding as it did the communication to the south over the river Thames. Its position led to many battles, and, in fact, from Reading to Eynsham more battles had taken place than in any other area of the same extent in the United Kingdom. The town had been the chief in Mercia; and now that there was a chance of those ancient divisions being restored, and the College having gained Home Rule, Oxford might again be its capital. In Norman times the town was handed over to O'Doili, who built the castle and St. Michael's tower, partly as a tower to the church and partly for the defence of the north wall of the town. It would be impossible to enumerate all the buildings in a short space, but he thought the proper way for them would be to select one good example out of each epoch. He described the boundary of the city in Medieval times, and referred to the portion of the city wall still standing in New College, which had been kept in a state of preservation under an agreement between the college and the city. When they came to the 13th century they came to the time when the colleges began to be founded, and he would select Merton as the only college which could boast of buildings at present which were still as when first erected. For the next hundred years he would select New College, founded and built about 1384, and for the next century Magdalen was *facile princeps*. The object of the society was not so much to be found in Oxford but in the country, where the country clergy wanted the moral support of an association such as theirs, and their visits to such places as Ilfley, Dorchester, or Stanton Harcourt might be of the greatest use, as it would be an irreparable loss if anything happened to them. No efforts they could make would be too much to resist the effects of time on buildings which they could thus make stand for still one further generation. He thought the City and University had done well to receive them kindly, and he trusted they would gain from the buildings a lesson which would enable them to live out the life of their own late President.

Lord Winchelsea having then declared the congress open, the Vice-Chancellor moved a vote of thanks to his Lordship, which was seconded by the Sheriff, and carried unanimously. At the conclusion of the proceedings in the council-chamber, the members and visitors, under the guidance of their indefatigable secretary, Mr. Wright, and Mr. Bruton, F.S.A., made a survey of the chief University (as distinct from collegiate) buildings, making their way first to the Radcliffe Institution (now used as an appendage to the Bodleian), the Sheldonian Theatre in Broad-street, in which the annual commemoration of founders and benefactors is held; the Ashmolean Museum, rich in antiquarian treasures and objects of curiosity; the quadrangle of the old schools, the Divinity School, with its rich and elaborately-carved roof, and, lastly, the Bodleian Library itself. Here they were received by the chief librarian, Mr. E. B. Nicholson, who gave the assembled party a brief historical account of the library, from the days when it was located in trunks and boxes in the parvise of St. Mary's Church, down to its first actual establishment by Sir Thomas Bodley in the reign of James I., and then tracing its growth and development to the present time, when it stands about sixth among the public libraries of Europe. He also explained the privileges which the library has enjoyed, and the principles on which it is now administered. He also gave an approximate account of the bulk of its contents, the number of its volumes, its rate of increase, &c., and he concluded by showing to the party the leading pictures and statues which adorn the walls and corridors of the library.

In the evening the archaeologists sat down to dinner in the large room at the Randolph Hotel, but Lord Winchelsea was unable to take the chair, as he had intended, on account of having taken a chill in the course of the morning's proceedings.

On Tuesday, the second day of the Congress, the party assembled soon after breakfast in the Hall of Merton College, when the Warden, the Hon. George C. Brodrick, read before them a most interesting historical paper on the early history of the University down to the middle of the thirteenth century, when it gradually gave

way to the Collegiate system of which Walter de Merton was the undoubted founder. His example was followed by other pious and generous donors, and before long Balliol College, University College, New College, and other Colleges made provision for the morals as well as the education of the rising youth of England. The Warden afterwards showed to the party the ancient College Library, in which some of the original shelves, seats, and benches still remain, after a lapse of six centuries, and also a few of the original chains by which the volumes were fastened and secured. He next pointed out the old "Mob" quadrangle, as it is called, and which still remains almost unaltered since the days of its founder; the College chapel, rich in brasses and painted glass, and in tracery of the Early Decorated period. He also pointed out to them the exquisite iron scroll-work still existing on the hall door, and the repairs which have been carried out in the sacristy, which was used lately as a brew-house. He ended by taking the party into the College garden, and showing them the terraced walk along the top of the southern city wall.

We will say more about the Congress next week.

#### SUB-CONTRACTING IN THE BUILDING TRADE.

BY A FABIAN.

SIR,—I cannot resist the opportunity of endorsing the admirable opinions expressed by E. C. Robins, F.S.A., in your last issue.

The London County Council and the School Board, "Thanks to the untiring energy of a few representatives of the workers," have shown us how the pernicious system may be scotched and eventually abolished.

My experience as a worker is, the good practical workman, the one who takes a pride in his work, is not the article in demand to-day; but the one who can rush and make a great show in the shortest time, "regardless of the stability of his work," is the one to command a job from the average sub-contractor. The workman is never led to believe his interest is required in the undertaking, consequently the sole ideal of labour is twelve o'clock on Saturday.

Now this abominable system is too deep-rooted to be plucked up at once. The question is, how to bring about a better state of things in the shortest period. The Trades Unions are working from their side, and is it not fair to ask the large employers to work from theirs, to hasten the solution of the difficulty? The interests of both are identical, but through the short-sighted policy in the past they have been antagonistic.

The United Building Trades Committee have secured the services of that eminent Member, Mr. Sydney C. Burton, to bring forward the whole question in the House, and I do not think I am wrong in saying we may rely upon some startling disclosures.

The Co-operative Builders' Company at Brixton is an object lesson for us; there every workman has a direct interest in the business.

The manner in which the trade has increased since Messrs. Curtis allowed their workmen to enter as partners, is a sufficient guarantee of the excellence of their work.

I believe other co-operative builders' companies are in course of formation, the members of whom have a thorough business knowledge, but lack the commercial experience so essential to success. Now is the time for those possessing that qualification to stretch out a helping hand to those anxious to sweep away the present unrighteous custom.

In conclusion, why should not the large firms take the men into their confidence and jointly devise some equitable mode of profit-sharing. The prevention of undue waste on the part of the men, together with the less need of over-lookings, would amply repay both parties.

A. C. H. GRAHAM.

ASSEMBLY ROOMS, BATH.—The proprietors invite tenders for a lease of these rooms, and the adjoining dwelling-house, together with their furniture, &c. The premises include a ball-room, tea-room, and two card-rooms. Originally known as the Upper Assembly Rooms, they were opened in 1771, having been erected at a cost of 20,000*l.*, after the designs, in the Doric mode, of John Wood the younger. The Lower Rooms, near to the Parade, in which Mrs. Piozzi opened a ball on her eightieth birthday, were destroyed by fire in 1820.

#### UNIVERSITY COLLEGE, LONDON.

##### AWARDS TO ARCHITECTURAL STUDENTS.

THE following awards have been made:—

ARCHITECTURE, Professor T. Roger Smith, F.R.I.B.A.—*First Art.* Donaldson Silver Medal. C. C. Brewer of Finchley. Second Prize. Kotaro Sakurai of Japan. Certificate, 3*rd*. Alfred Hale of Birmingham. *Second Class.* F. K. Kendall of Blackheath. *Third Class.* R. M. Whellock of Nunhead.—*Sketches.* Prize. Kotaro Sakurai of Japan.—*Construction.* Donaldson Silver Medal. Kotaro Sakurai of Japan. Second Prize. F. J. Slater of London. *Second Class.* T. A. Brooks of London. E. B. Hoole of London.—*Modern Practice.* Prize. Louis Jacob of New Cross. Certificate, 2*nd*. Dendy Watney of Croydon. *Second Class.* H. R. Appelbee of London. H. Healdon of London.

CIVIL ENGINEERING AND SURVEYING, Professor L. F. Vernon-Harcourt, M.A., M.I.C.E.—*Civil Engineering.* Prize. A. P. Head of Newcastle-on-Tyne. *Third Class.* L. C. J. Doxat of Dawlish.—*Surveying.* Prize. A. P. Head of Newcastle-on-Tyne. *Second Class.* J. S. Gomar of Madrid, W. B. K. Ridge of Enfield. *Third Class.* E. Lyon of Valparaiso.

GILCHRIST ENGINEERING SCHOLARSHIPS.—Entrance Scholarship, 35*l.* per annum for two years.—R. D. Hall of London.

#### THE ASSOCIATION OF MUNICIPAL ENGINEERS AT LIVERPOOL.

WE conclude our notes of the Annual Meeting of the Association of Municipal Engineers and Surveyors, recently held in Liverpool (see p. 8 *ante*).

##### The London Sewage Question.

Mr. Crawford Barlow, B.A., M. Inst. C.E., read a paper on this subject. In his introductory remarks the author said: The Metropolitan Board of Works' scheme for the main drainage of London, so ably designed by, and constructed under the supervision of, Sir J. Bazalgette, was laid out to deal with the sewage of a population of three millions and a half. That is to say, in designing the system in 1856, provision was made for an increase of population for about twenty years in advance. In 1875 the population of London reached that figure, and since then the system has been over-charged. In addition, the arrangement for the disposal of the sewage by discharging it into the Thames immediately outside the metropolitan area, was only sanctioned on the understanding that a more complete system of disposal was to be arranged as soon as practicable. . . .

The defects of the present sewerage system were anticipated as long ago as 1858 by the referees (Captain Galton and Mr. Simpson) in their reply to Messrs. Bidder, Hawkesley, and Bazalgette's report, in the following words:—

"That the limited provision for rainfall in the sewers proposed by Messrs. Bidder, Hawkesley, and Bazalgette would cause the sewage too frequently to overflow into the Thames within the metropolitan district."

"That the proposition to throw the whole sewage of the metropolis in a concentrated mass into the Thames at Barking, close to the metropolitan boundary, would not prevent the sewage from returning within the metropolitan districts, and would be injurious to those eastern districts of the metropolis which lie adjacent to the Thames, the population of which is rapidly extending, in consequence of the great increase of the commerce of the Port of London."

The author then referred to the facts elicited by the Royal Metropolitan Sewage Discharge Commission, and discussed these recommendations. In conclusion, he submitted for consideration the following suggestions with regard to the London sewage question:—

First, as regards separation. That it is desirable that a partial separation of rain and spring waters from sewage should be made throughout the whole of the Metropolitan district, so as to provide more accommodation for the sewage proper in the present system of sewers, and thus diminish the amount of liquid which has to be pumped and disposed of, and also lessen the amount of sewage which is at present being discharged in rapidly increasing quantities into the river in the centre of the metropolis during rainy weather.

Second, as regards disposal. That, as no chemical treatment has yet been found effective in thoroughly purifying sewage, and as there is great probability of serious complications in regard to the proposal of barging the sludge to the mouth of the Thames, the course proposed

\* Obtained the number of marks qualifying for a Prize.



by the late Metropolitan Board of Works can only be regarded as experimental, and that as the preponderance of scientific evidence, the opinions of the Royal Commission as expressed in their report, and the experience of the two next largest cities, agree that a land treatment is an effective method—investigations coupled with experiments should be made simultaneously with the above, with the view of ascertaining whether a land treatment alone, or precipitation supplemented with land treatment (as recommended by the Commission), would not give better results in disposing of the London sewage.

Colonel Jones, V.C., Consulting Engineer for Wrexham, in proposing a vote of thanks to the reader of the paper, said he entirely agreed with the suggestion regarding separation. Unfortunately, the London County Council had inherited a debt of 1,000,000, on permanent works, and were committed to giving a trial to the works, although he thought they would be found useless.

Mr. Enchus (Edmonton) seconded the motion. He was of opinion that for a system of broad irrigation 40,000 acres of land would be needed, at a cost of 1,000,000. The greater cost would, however, be for the distributing channels, which would cost 4,000,000, and, at 3 per cent., the total sum required would be 150,000, a year. In addition, farming operations would mean 10L per acre, or an annual expenditure of 400,000.

Mr. Charles Jones (Ealing) did not see why the sewage of London should not be dealt with by burning.

Mr. J. Norrington (Fulham) thought the London surveyors would soon give up the idea of burning either ashes or sewage. Irrigation was the most natural process.

Mr. W. H. Savage (East Ham) said he agreed with the importance of separating the rain-water from the sewage.

The president, in summing up the discussion, said the separation system was one of which engineers thought favourably.

The vote of thanks to Mr. Barlow was then put and carried, the meeting then adjourning to the dining-hall, where they had been invited to lunch by the Mayor (Mr. T. Hughes), in whose absence Mr. T. Holder presided.

#### The River Mersey.

Mr. W. Spinks, Assoc. M. Inst. C.E., read a paper on "The River Mersey," dealing with it and its tributaries in their geographical, statistical, commercial, engineering, and sanitary aspects. On the subject of the prevention of floods, he said that, in spite of all the water that is impounded and diverted, there has been, at times of exceptional rainfall, very heavy flooding in the low-lying reaches of the river, which has caused enormous damage both to property and stock; the subject of their prevention has received attention at the hands of many eminent engineers, amongst whom may be mentioned the late Mr. J. F. Bateman. Much has been done to improve the scour of the various rivers by different Corporations, and especially by the Corporation of Manchester on the rivers Irk and Medlock, by keeping the channel confined within substantial walls, and so preventing both erosion and digression. But perhaps the greatest improvement of all has been effected by the adoption of the movable weir as invented by Mr. Francis Wiswall, A.M.I.C.E., at present engineer of the Bridgewater Canals Undertaking of the Manchester Ship Canal Company, and who at the time of the erection of the Throstle Nest Weir, was engineer to the Mersey and Irwell Navigation. The Throstle Nest Weir was erected in 1882 and its success was so complete that it was decided by the Bridgewater Navigation to alter all the fixed weirs between Manchester and Warrington to movable weirs of similar design, but the interruption of the Ship Canal stopped operations after a considerable amount of money had been spent. Throstle Nest Weir consists of a series of fourteen rectangular sluice gates turning on a common axis, and when closed the gates, with the framework which supports them, present a surface to the stream of 1,400 square feet = 140 ft. x 10 ft. wide, which is reduced to 293 ft. or one-fifth of the obstruction when the gates are open. When closed the gates are inclined at an angle of 35 deg. from the perpendicular, and when open they are suspended in a horizontal plane. The gates retain their inclined position until the water of the river rises to 2 ft. 9 in. above its ordinary level, when the back pressure is sufficient to

cause them to tilt automatically and release the impounded water; in addition, drawchains are provided, by which any or all of the gates can be opened at will, and the impounded water gradually released. The river bed is laid with a sheathing of stone and timber, and is perfectly level, the breadth across the river being 140 ft., and length down stream 33 ft. At intervals of 10 ft. centre to centre across the river-bed cast-iron piers have been placed, and these carry a turned shafting on which the sluice-gates hang and turn in lengths of 10 ft. The tilting sluice-gates, which are framed of English oak and planked with pine, are 12 ft. long, 10 ft. wide, and 9 ft. below the axle. To the centre of the foot of each gate a drawchain is attached, and there are two multiple crabs, one on each side of the river, and each connected with seven of the gates, by which the sluices can be raised or lowered separately at will. Referring to the approaching completion of the Manchester Ship Canal, he said it was imperative that no time should be lost in setting about the purifying of the waters it is to receive and retain, otherwise it may, and probably will, become nothing else but a chain of elongated precipitation tanks from Salford the whole way to Eastham—a condition of things which can be very readily imagined, and from which the direst consequences may accrue, not only to the unfortunate residents contiguous to its banks, but to the parties responsible for the offences committed.

Mr. Parry (Reading) proposed a vote of thanks to Mr. Spinks, and Mr. Fowler seconded the vote, and in doing so said the purification of the Ship Canal would be a serious matter. There would be a large amount of still water on the Irwell, and the various locks would become a series of cesspools unless properly looked after. The banks of the Canal would also have much filth deposited on them. It was for the Canal Company to think what would be the effect of bringing men fresh from the Atlantic, and putting them on one of the Irwell cesspools. The paper had been read at a most opportune time.

Mr. Pritchard (Birmingham), in supporting the vote of thanks, remarked that as engineers they would all be glad to see the Ship Canal successfully finished. Although they might have various opinions as to its effects on Liverpool, they could only be of one opinion as to the prevention of its pollution. Mr. Spinks could not have chosen a more opportune time for his paper.

Mr. G. F. Deacon said the paper of Mr. Spinks was a most useful addition to his (Mr. Deacon's) knowledge of the Mersey. He then proceeded to speak on the change of channel and deposit of silt in the Mersey; and a vote of thanks was heartily accorded to Mr. Spinks for his paper.

Mr. E. P. Hooley, Assoc. M.I.C.E., County Surveyor of Nottinghamshire, read a paper on "The Maintenance of Main Roads and County Management." The system advocated by the reader was the payment of all charges in connexion with main roads by the county authority direct; no profit or loss to be changed by either side, and whatever the county authority would have to expend to maintain the roads if they were in their own hands should be expended by the urban authority, and paid for by the county authority. He thought the County Council should most certainly directly manage all roads that had hitherto been managed by highway boards and parishes. He proceeded to enumerate the amount of labour and material to be expended on roads, and the direction of all the work.

A brief discussion followed, being conducted by Mr. W. Brooke (Richmond), Mr. J. Lubley (Hanley), Mr. Norrington (Fulham), Mr. Silcock (King's Lynn), Mr. Spinks, Mr. Vallance (Notts), Mr. W. H. Savage, and others. A vote of thanks was passed to the reader of the paper.

Mr. J. H. Burton, Surveyor to the Andenshaw Local Board, read a brief paper on "Traction-engines, and their effect on roads and buildings."

A vote of thanks was accorded to Mr. Burton. At the conclusion of the meeting, the president proposed a vote of thanks to the Mayor for his hospitality, and for the use of the Town Hall, and this being seconded by Mr. Charles Jones (Ealing), hon. secretary of the Association, was heartily accorded.

In the evening, the annual dinner of the Association was held in Eberle's Restaurant, Eberle-street. There was a large company

present, the chair being occupied by the President, who was supported by Mr. Alfred Holt (Chairman of the Dock Board), Alderman T. R. Shallcross, Councillor W. Clarkson, Dr. Stopford Taylor (Medical Officer of Health), Mr. W. H. C. Mesurier (Assistant Dock Engineer), Mr. F. M. Evanson, and Mr. T. M. Bellard Reader.

On Friday and Saturday the members of the Association visited the docks and other places of interest to them as engineers and sanitarians.

#### Illustrations.

##### INTERIOR OF HALIFAX CATHEDRAL, NOVA SCOTIA.

THIS is the interior of the cathedral, designed by Mr. Arthur E. Street, for Halifax, Nova Scotia, the exterior design of which was published in the *Builder* for May 18, 1889, at which time we gave a description of the building, to which it is unnecessary to add anything further.

The drawing from which the illustration is taken is exhibited in the Architectural Room at the Royal Academy.

##### SHEFFIELD MUNICIPAL BUILDINGS COMPETITION.

WE publish this week the view and principal plans of the design submitted in the second competition by Messrs. Flockton & Gibbs, of Sheffield. The plan, as will be seen, differs materially from those hitherto published in the type of arrangement adopted. The following extracts from the architect's report will serve to explain their views and intentions in the design—

"Treatment of Site.—The building is placed within the boundaries of the site, having its principal front and main entrance facing directly the large open space, about 225 ft. long and 262 ft. wide, formed by the junction of the five streets, the obelisk in the middle of which is in the central line of the building. The main entrance is thus fixed in the most prominent and convenient position for access from all five streets. The other three fronts have also open spaces between them and Finstone-street, St. Paul's Churchyard, and Surrey-street, and thus an abundant supply of light and air is secured on all sides, while the building is exceptionally well placed for being seen to advantage from all surrounding points. The one-story building in Surrey-street is so comparatively low as not to interfere with these advantages, but rather to enhance the effect of the main building by spreading its base, and giving attachment to the ground. The fine open space or "place" resulting from the street improvements in this locality is by this design turned to the greatest advantage, both to the building and itself.

A considerable plot of land at the Norfolk-street end, sufficient to provide accommodation for three or four additional departments, remains unappropriated.

Notes on Internal Arrangements.—Each set of offices for a department is made complete in itself, the entrance for the public being inter, and by way of, the general or inquiry office, from which access is easy and direct to a corridor in which are the private offices. These corridors give the officers the means of communicating with each other without entering the general office, and also with the general office at different points.

The advantages of this plan over the usual arrangement of public corridors consist, not merely in the feature that no facilities are given for the public to seek admittance where they are not wanted, but that the private offices are rendered more quiet and undisturbed, the intercommunication more easy, and the control by the heads of the department more perfect.

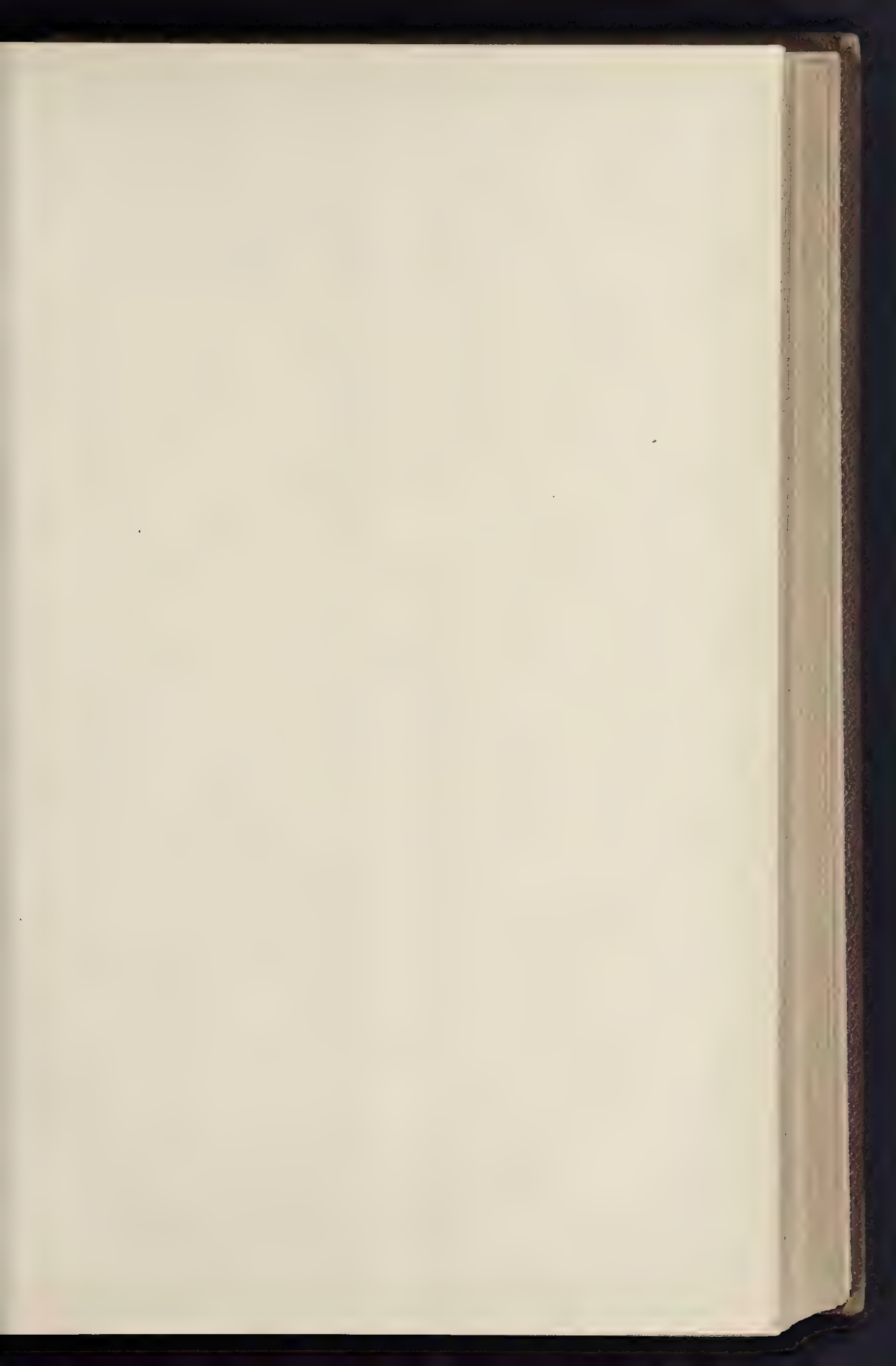
The Departments, except the Health Department, are all approached from the central hall with its staircases, which is entered from the outside by the principal doorway. Private entrances and staircases and other means of communication are provided for the officials.

The entrances to the Accountant's and Water Departments are on opposite sides of the central hall; and from the hall can be seen those to the Departments of the Town Clerk and the Borough Surveyor, so that one hall-porter, centrally placed, could control the whole.

The pay office, smith's shop, meter testing, weights and measures, and room for the sale of disinfectants, also the public waiting-rooms, lavatories, &c., it has been thought very desirable to keep outside the main structure, and they are therefore provided in detached buildings.

Notes on Accommodation, &c.—The Borough Accountant's General Office has a counter 78 ft. long, and in addition to accommodation, as shown on the plan, for thirty clerks at desks, there is room for an extension of desks, so as if required to raise







SHEFFIELD MUNICIPAL BUILDINGS: FINAL COMP

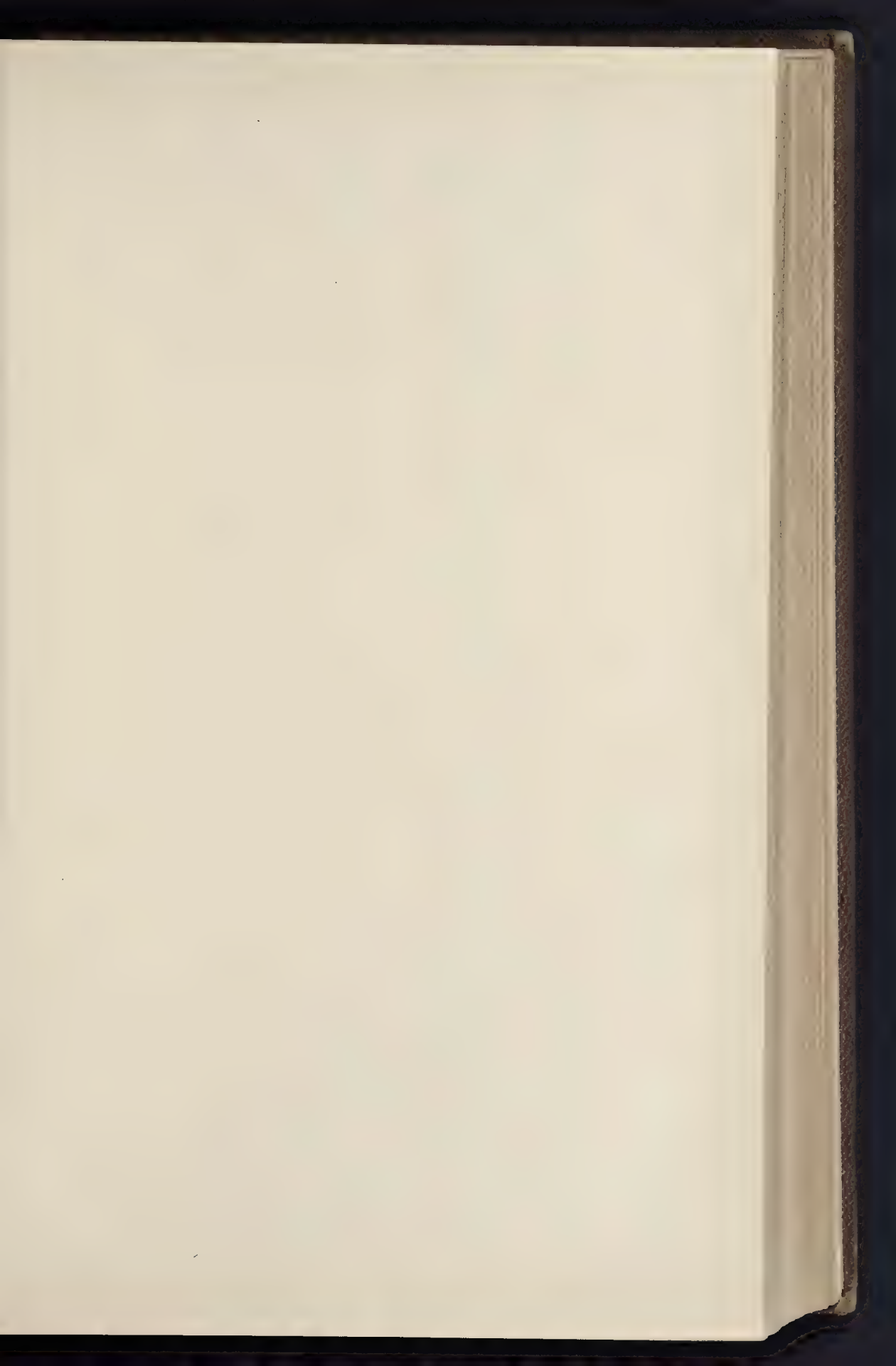


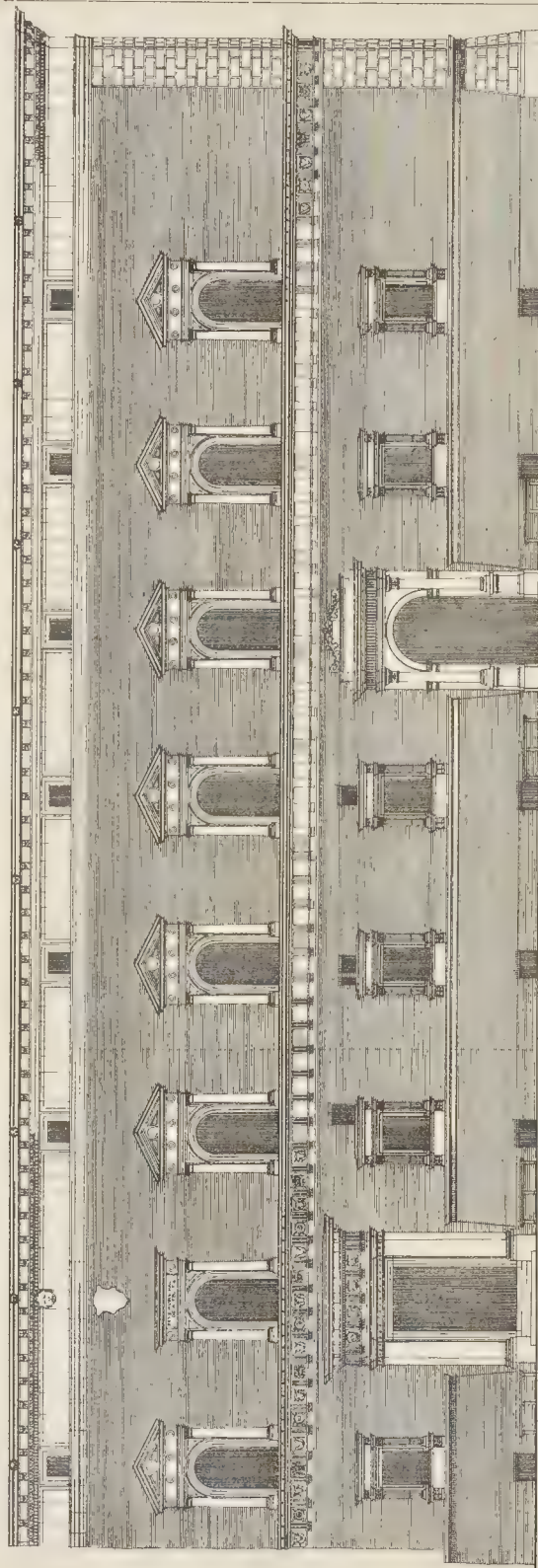


NA PHOTO BY AG. E. & F. P. MARTIN, LONDON, ENGL.







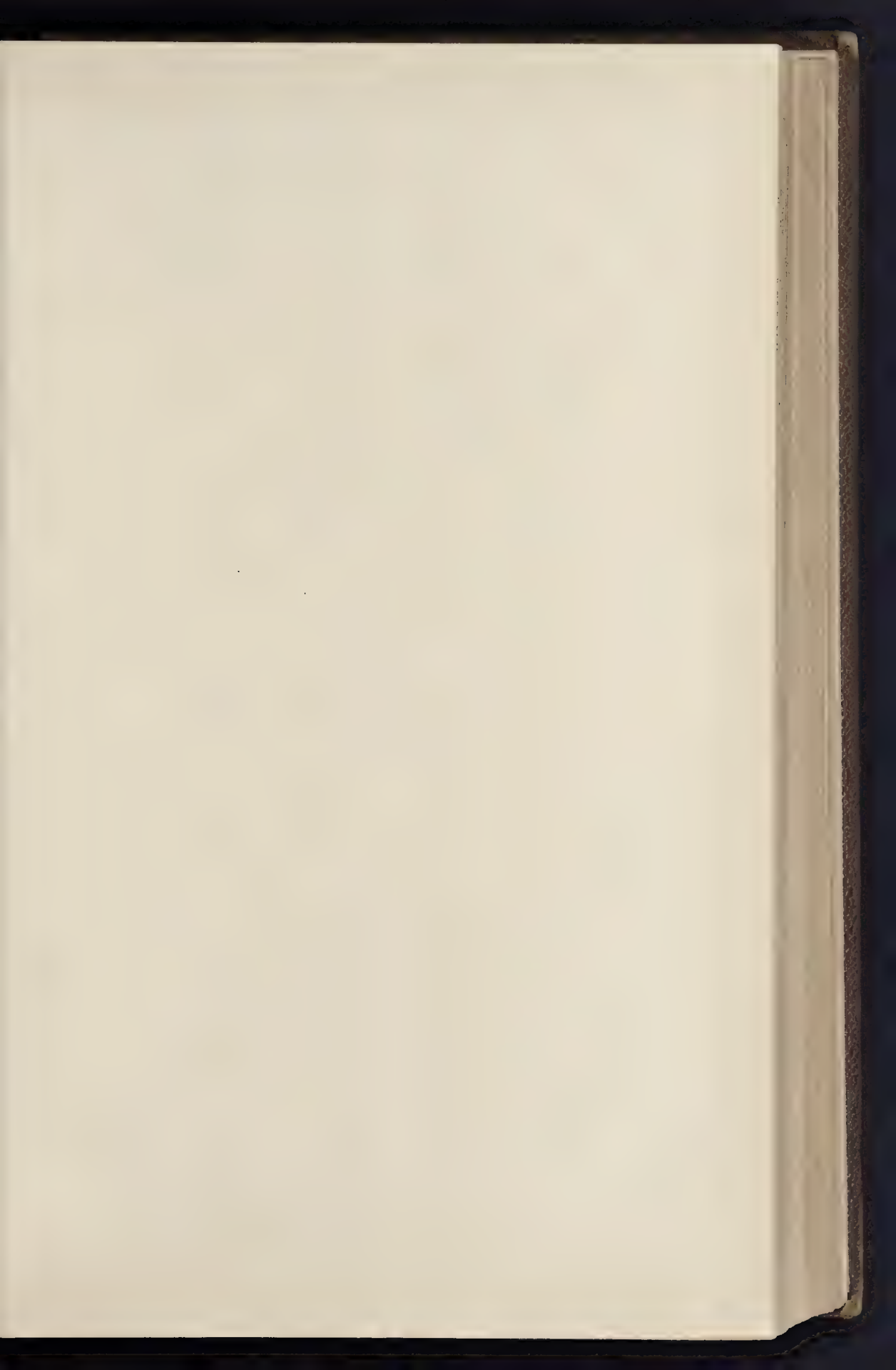


BOLOGNA: The Palazzo  
*Albergati-  
Baldassare  
Peruzzi. Ar-  
chitect 1540*  
No. 1.

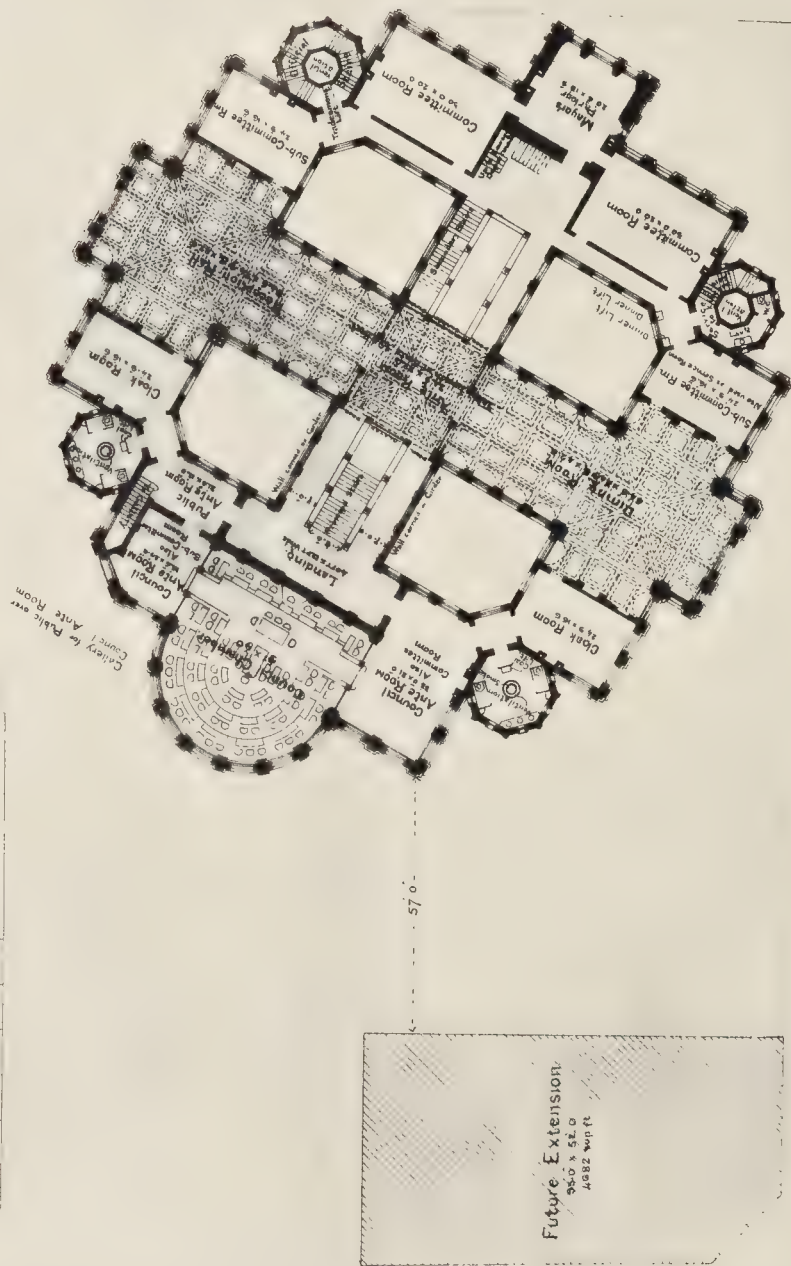
Front Elevation.

Scale. 0 10 20 30 40 50 60 70 80 90 100 feet





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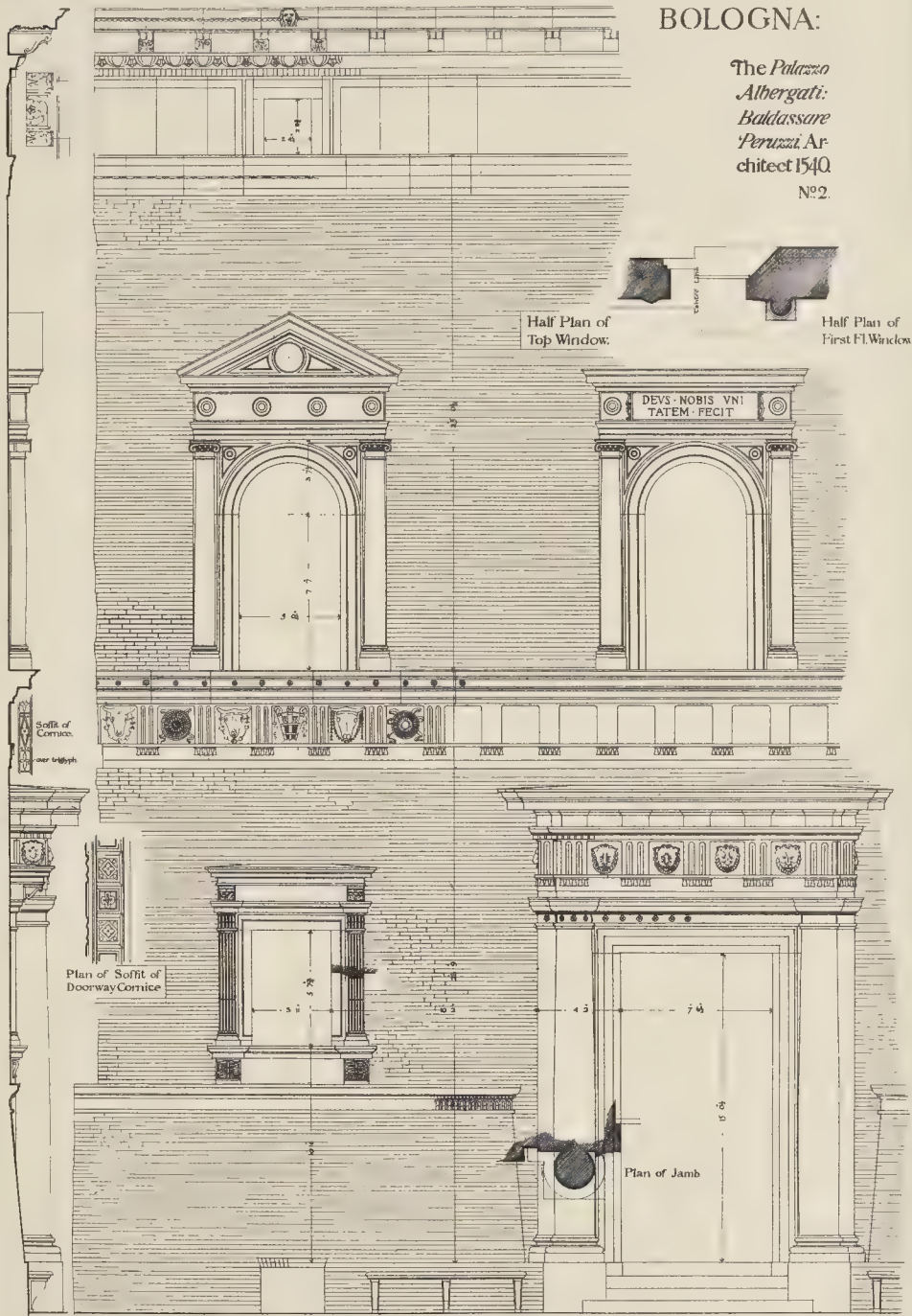
SHEFFIELD MUNICIPAL BUILDINGS. FINAL COMPETITION. DESIGN SUBMITTED BY MESSRS. FLOCKTON & GIBBS.





# BOLOGNA:

The Palazzo  
Albergati:  
Baldassare  
Peruzzi, Ar-  
chitect 1540.  
No. 2.



Part Elevation of Façade.

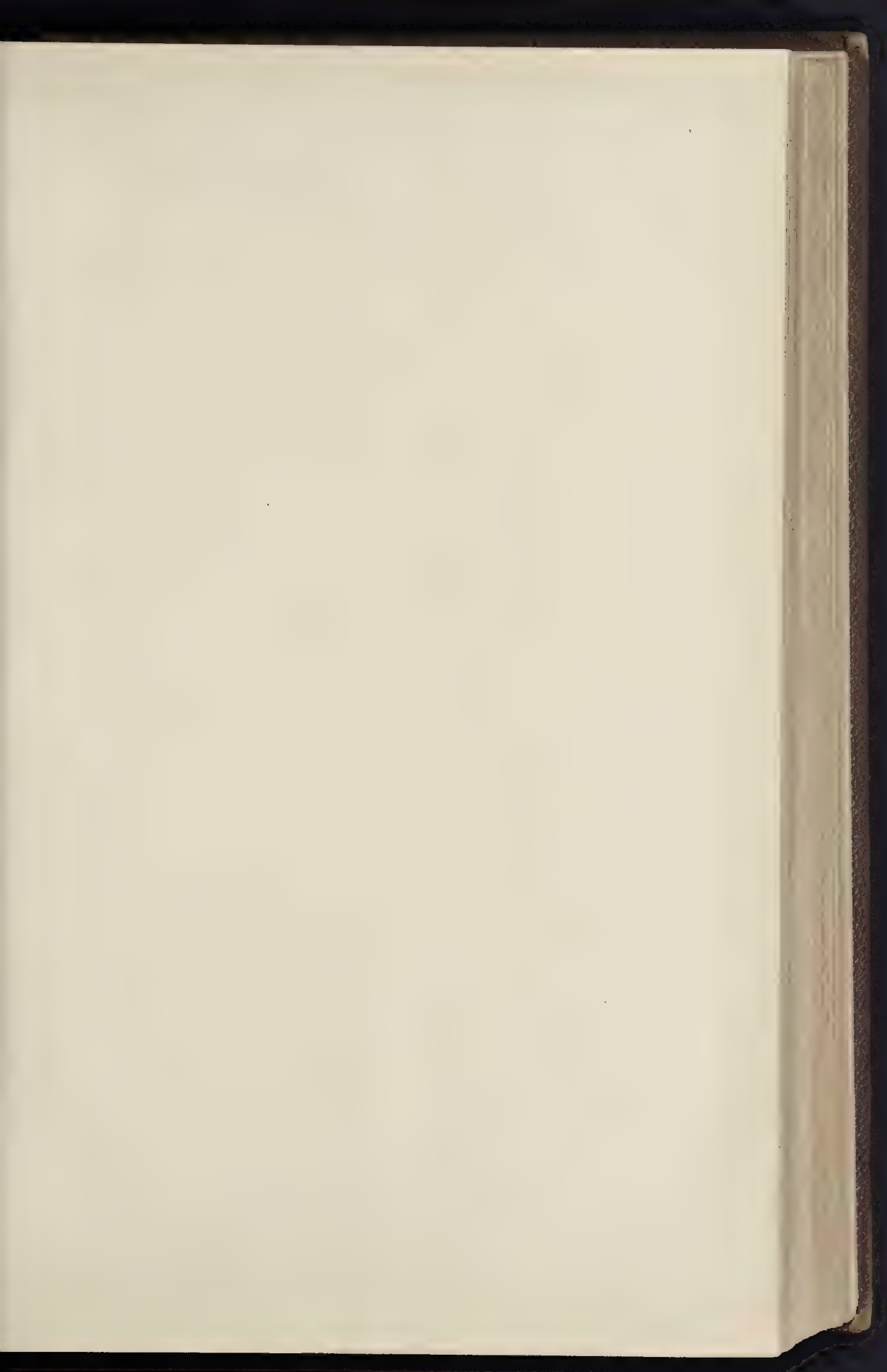
Scale

PHOTO LITHO G. RAU & CO 22 MARTIN LANE CANNON ST LONDON E.C.

MEASURED AND DRAWN BY MR. W. J. ANDERSON, ARCHITECT.







THE BUILDER, JULY 12 1884







INTERIOR OF HALIFAX CATHEDRAL, NOVA SCOTIA. MR. ASHUR & E. STREET. ARTIST. ARGENT. 1.





this number to forty-four. This and the Waterworks General Office are lighted partly from skylights and partly from windows 5 ft. 6 in. high on each side of the raised central portions, these windows being also available for ventilation.

The Council Chamber is in the form best adapted for speaking and hearing, nearer a square than a semi-circle in proportion, has abundant light, and is in position free from noise. It will seat more than the present number of members of the Council. . . .

*Net Cubical Contents.*—Foundations, from 10 ft. below present surface up to area level; tower, 12 ft. below present surface up to area level, 122,143; superstructures, from area level to eaves, spouts, 1,211,621; roofs, 132,075; dormer windows, chimneys, turrets above eaves, 31,546; tower above eaves, 44,603; area walls, balustrades, steps, &c., 3,661; total, 1,550,539. These works can be carried out for 50,000.

#### Explanatory Statement accompanying Design in Final Competition.

The design of the building is essentially the same as originally submitted, some of the additional drawings being intended for its more complete illustration, and others to show sundry modifications arising out of the remarks of the Assessor and the instructions for the final competition. . . .

Referring to the instructions for the final competition, the design, as originally submitted, complied in a remarkable degree with seven out of the first eight of these, viz., a, b, d, e, f, g, h, the exception being c, which suggests the provision of one rather than two staircases. The principal staircase was originally a good one, and has been slightly improved, as already explained; and the secondary stairs have been retained, as being desirable in addition for convenient and ready access to, and communication between, different parts of the building.

With regard to the remark (f), the reception-rooms, &c., with their access from Finsbury-street, the design arranged to cut off from the departmental offices without in any way interfering with the public resorting to these offices, on giving the public for the occasion the use of the turret staircases (ordinarily reserved for officials only), which lead direct from the street to each department, and afford means of inter-communication without in any way interfering with access to, and use of, the reception-rooms, &c. It is presumed, however, that this diversion would not be required for Council or committee meetings, and but seldom for the reception-rooms, as the use of the latter to any extent would be mostly after business hours.

The original design also complied with the remaining eight instructions for the final competition (namely i to p inclusive), except so far as they refer to altered dimensions and portions of rooms. Four of these (i, j, k, and m) embrace the idea of a concentration of the offices of a "department" with "access through the general office, serving as an inquiry office." For the Accountants' and Waterworks Departments this idea is emphasised, and in these two departments it is most fully developed in the original design. No. 157, special attention having been drawn to the arrangement and its advantages over the usual arrangement of public corridors, in the explanatory statement which accompanied the drawings. The arrangement, though something approaching it has been adopted in detached buildings, such as the Corporation of Sheffield already use for some of their departments, has, so far as is known, never been adopted in municipal buildings where there is a combination of such departments, but that design No. 157, as originally submitted, is entirely novel in this respect. . . .

The cubical contents and estimate are unaltered. A collateral advantage attending this design is that the exact position of the building may be determined after the site has been cleared, and when the whole can be viewed from every point. This advantage arises from the design having large open spaces on all the fronts within the building-line, thus doing away with the necessity in erecting the building for keeping strictly within that line, which, when laid down for the purposes of the competition, was probably determined with a view to the fronts being built close up to it."

#### ELEVATION AND DETAILS OF THE ALBERGATI PALACE, BOLOGNA.

The measured drawings of this interesting building, attributed to Peruzzi, are reproduced from the collection of "Architectural Studies in Italy," carried out by Mr. W. J. Anderson, architect, of Glasgow, in pursuance of the conditions of the award to him of the "Alexander Thomson Travelling Studentship," and published as a volume of architectural illustrations, of which a notice will be found in another column.

**PROPOSED NEW OPERA-HOUSE IN LONDON.**—The *Financial News* says that a project is on foot to erect a National Opera-house in a central position in London. A site has been secured and the capital is being privately subscribed.

#### THE LONDON COUNTY COUNCIL.

The ordinary weekly meeting of the London County Council was held on Tuesday at Spring-gardens, the Earl of Rosebery in the chair.

*Impending Resignation of the Chairman.*—Lord Rosebery, in reply to a question, said that he would arrange to send in his resignation in time for the Council to choose his successor before the adjournment for the summer recess.

*The Holiday Recess.*—On the motion of Councillor Benn, it was resolved:—

"That the Council at its rising on Tuesday, July 29, do stand adjourned for the summer recess until Tuesday, September 30, and that no Committee do meet after the date of the Council's adjournment until Monday, September 22, unless in a case of urgency which will in the opinion of the Chairman of the Committee not admit of delay; provided that the Chairman of the Council shall have authority to convene a meeting of the Council during the recess if he deem it necessary to do so."

*Proposed Improvement Schemes.*—The Improvement Committee brought up a report stating that in conformity with the resolution of the Council of December 17 last, they had prepared, to submit to the Council at its next meeting, a list of improvements involving application for Parliamentary powers. The proposed improvements were in various districts of London, and were all of more or less urgency.

If deferred, some of them would undoubtedly cost much more than the sums now proposed to be expended. As, however, the Committee gathered from the resolution of the Council at its last meeting relative to the Strand Improvements Bill that it was reluctant to sanction any further expenditure for metropolitan improvements until the principle of betterment shall have been conceded by Parliament, the Committee thought it their duty, before taking any further steps, to seek the definite instructions of the Council as to what course they should adopt. In order to facilitate an expression of opinion on the part of the Council, they recommended *pro forma*,—

"That the Improvements Committee be instructed to bring up at the next meeting of the Council details of the schemes of improvement referred to."

This was agreed to, after some little discussion.

*Amendment of the Metropolitan Building Act.*—The first paragraph of the Building Act Committee's report was as follows:—

"The order of reference to the Building Act Committee includes a power that the Committee should report from time to time to the Council as to the desirability of amending the Metropolitan Building Acts. The amendment of these Acts is urgently needed, and what the Committee now propose is that an entire revision should be proceeded with. They accordingly desire to commence the work at once, and for this purpose they feel it necessary that they should have some skilled help. As the Committee is satisfied that the officials of the Building Act branch of the Architect's Department have their time fully occupied with the current work arising under the administration of the various Acts, they deem it necessary to recommend—

"That the Council do authorise the Committee to make arrangements for some extra assistance."

Councillor Hutton, the Chairman of the Committee, in moving the adoption of the report, said that the subject of the amendment of the Metropolitan Building Acts was already before Parliament at the present time, both in the Metropolitan Management Bill and in the General Powers Bill of the Council; but, nevertheless, the whole subject of the amendment and codification of the Metropolitan Building Acts required urgent attention, and would take considerable time and require expert assistance.

Councillor Lawson said he inferred from Mr. Ritchie's remarks in the House of Commons the other evening that Mr. Ritchie had such a Bill in contemplation.

Councillor Hutton said he believed that was so; at any rate, Mr. Ritchie had assured him of his willingness to co-operate with the Council in the matter.

The recommendation was agreed to, and after the transaction of other business, the Council adjourned.

**THE WHITEFRIARS GLASS WORKS.**—The *Pall Mall Gazette* of Monday last contained a report of an interesting interview with Mr. James Powell at these well-known works, which has been in active existence, we are told, since the time of the Great Fire in 1666. Mr. Powell explained in detail to his interviewer the process of making glass mosaic decorations, such as the panel recently made by them for Clifton College Chapel, already noticed in our columns.

#### Books.

*The Voyage of H.M.S. Beagle: Being a Journal of Researches into the Natural History of the Countries visited during the Voyage Round the World of H.M.S. Beagle.* By CHARLES DARWIN, M.A., F.R.S. A New Edition. London: John Murray. 1890.

THIS is a reprint of Darwin's first book, written when as a young man he obtained the appointment of naturalist on the surveying expedition about the Coast of South America (mainly) under the command of Captain Fitzroy. The original formed the third volume of the report of the expedition published in four volumes under the title "Voyages of the *Adventure* and *Beagle*," a book of great interest, now, we believe, out of print as a whole.

The book, as may be supposed, contains nothing specially relating to the subjects to which our pages are devoted; but as the first publication of so remarkable a man, and as a book full of curious and interesting observation of nature in all her forms, it is one which should be of interest to educated men of all professions.

*A Bibliography of Tunisia. From the earliest times to the end of 1888.* By H. S. ASHBEE, F.S.A., F.R.G.S. With a map. London: Dulau & Co. 1889.

THIS is in reality merely a list of books in which information on ancient and modern Tunisia may be found; including such information as will throw light on the effects on Tunisia of the Punic Wars, the Roman occupation, the Arab conquest, the expeditions of Louis IX. and Charles V., and the French protectorate. The list makes a considerable volume in itself, and its production must have required no little trouble and research. It is intended, we presume, as a kind of appendix to the joint work by Mr. A. Graham and Mr. Ashbee on Tunisian architecture, which we noticed some little time since. As interest in Tunisia is likely to increase, and its architecture is a field not yet much worked, the book is of considerable practical value to students.

*The Parish Church of St. Mary, Whapload, in the county of Lincoln.* By W. E. FOSTER, F.S.A. London: Elliot Stock. 1889.

WE refer in another column to the visit of the Lincoln and Notts. Architectural Society to Whapload during their annual excursion a few days ago, and it is therefore opportune to call attention to this short history of that very interesting church. The book is archaeological rather than architectural, and aims at giving in a small compass a history of the church, together with some historical notes as to the history of the neighbourhood and surrounding families. The author devotes some attention, however, to the architectural features of the church, and gives a plan, engraved so as to show the various dates of different portions, an engraving of a portion of the remarkable Norman chancel arch with its effective decoration, and illustrations of some other features, mouldings and caps, &c. These are not very well executed, and the general view of the church which forms the frontispiece had better have been omitted. The sections of Norman abaci, given on page 33, are placed upside down, as we presume the author is aware, but it shows rather careless revision of the proofs that such a glaring error should have been passed over. The book is of value, however, as a record of the history and dates &c of the church.

*The Anatomy of Pattern.* By LEWIS F. DAY. Second edition, revised. London: Batsford. 1889.

WE have already fully expressed our appreciation of Mr. Day's admirable little illustrated book on this subject. The second edition presents no material difference from the first; but we are glad to find that a second edition was called for.

"*Work, an Illustrated Magazine of Practice and Theory for all Workmen, Professional and Amateur,*" edited by Francis Young (London: Cassell & Co.), is a very useful miscellany. It has recently completed its first yearly volume, which is now before us. It is well printed and freely illustrated, and is very comprehensive in its scope, as may be gathered from its title.

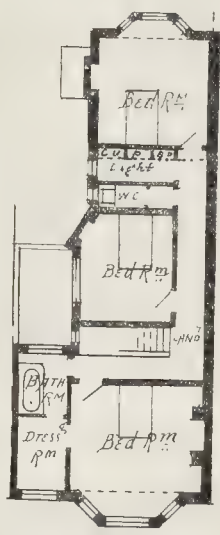


Fig. 2.

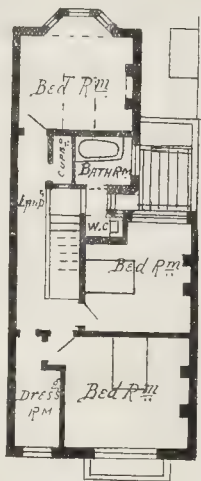


Fig. 3.

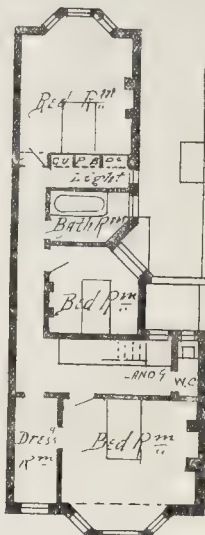


Fig. 4.

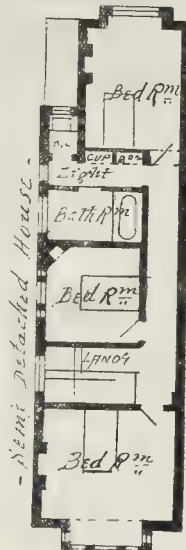


Fig. 5.

First Floor Plans to Mr. Knightley's Proposed Improvements in Six- and Eight-roomed Houses (see p. 399, last vol.).

Workmen of all trades, apprentices, "the handy man," and the boy with a liking for tools, will each and all be able to find something to suit them in the pages of *Work*. But, as generally happens in "technical instructors" of this kind, the "ornamental" designs for "art furniture," &c., are either poor in taste or not well adapted to the purpose they are intended to serve. For instance, the reader is told, and shown by detail illustrations, how to construct a folding screen in "Egyptian trellis work" (*mushkrebeeyeh*), but, as the writer admits, such a screen would not shelter a portion of a room from draughts or observation, although, in appearance, it might be a very effective piece of furniture.

### Correspondence.

To the Editor of THE BUILDER.

#### "A PLEA FOR THE IMPROVEMENT OF SIX- AND EIGHT-ROOMED HOUSES."

SIR,—I send you herewith the first-floor plans for my four former house designs [see *Builder* for May 31, p. 399]. I am not attacking any one. I simply ask for these plans to be introduced; if the public choose to avail themselves of them all well and good. I apologise for the delay.

T. E. KNIGHTLEY.

#### THE ARCHITECTURAL ASSOCIATION.

SIR,—As an old member of this body, I should like to state that I agree with the views of Mr. J. Douglass Mathews, expressed in his letter published in your last issue.

Improvements are necessary, but they must be gradually introduced.

The alteration in the amount of the subscription should be abandoned, except for members joining in the future, as the resignations in consequence would be numerous.

HENRY LOVEGROVE.

\* \* \* We do not believe anything of the kind; and the few members who might resign for so paltry a reason would be better away.—Ed.

#### "EARTHWORK SLIPS AND SUBSIDENCES UPON PUBLIC WORKS."

SIR,—May I ask the favour of a few words respecting your able review of this book in your journal of the 5th inst., for which I tender to you my thanks.

In the last few lines of the notice of pages 182 to 186, it is stated that the volumes of the embankment are "miscomputed," &c. Pardon my saying that the calculations are correct. It is stated in the

book that the cubic contents, A to C, are those of "two inclined portions," i.e., of two slopes. Instead of dividing the perpendicular by two, as usual, and so computing the contents of each slope, the volume of the two slopes is obtained by one operation, producing the same correct result. The diagram was unfortunately misplaced in the "pacing," and too late to permit of my correction. It should have been on p. 182, and not on p. 181.

With reference to flood-water, named in column two, p. 2, of your issue of the 5th inst., the expression "any backwater is not prevented from escaping," is meant to relate to the retention of surface waters after subsidence of a flood. I quite agree my sentence is not as clear as it might be. The system named has been adopted to save expensive outlets in an embankment, which would have been required only at times of flood.

The substitution of an unlined tunnel in rock, in lieu of a masonry culvert, was frequently adopted on the Intercolonial Railway of Canada, in and about the year 1870, as it was found to be a cheaper and more expeditious method of construction, as no skilled labour was required, and the work was carried on in any weather, and during periods of cold in which no mortar could be safely used.

J. NEWMAN, Assoc. M.Inst. C.E.

### The Student's Column.

#### HOT-WATER SUPPLY.—II.

##### BOILERS AND INCrustATION.

INFORMATION upon boilers for hot-water supply must, to make the subject clearly understood, necessarily be preceded by an inquiry into the cause and effects of the incrustated deposit, or "fur," which accumulates so rapidly in these boilers (when what is known as "hard" water is used), as their shape, construction, and general character is, to a great extent, governed by a consideration of this subject.

The origin of the term "hard," as applied to water holding lime in solution, cannot well be traced; but most probably it was first used in contradistinction to the sensation of softness that is experienced with distilled or rain-water, or nearly any water which has but a small percentage of lime in solution.

Our supply of hard water (so far as concerns this paper) may be considered to be limited to that which proceeds either through or from chalk strata, and as this water is usually of a crystal-like clearness, it naturally becomes difficult for the untrained to make it accountable for the hard, stony deposit (limestone, in fact) that incrusts the inner surfaces of these and of steam boilers.

To explain the cause first, the generally accepted theory is as follows:

Water which descends to the earth in the

form of rain comes in contact with, and readily takes up, carbonic acid, either from the air in which this gas is present to a considerable extent, in the vicinity of populated places, or from decaying vegetable matter in the open country. This water, charged with carbonic acid gas, percolates through the earth, and immediately it comes in contact with chalk (carbonate of lime, calcic carbonate) the acids enters into combination with the chalk, producing bicarbonate of lime (calcic bicarbonate), which is highly soluble in water; in fact, might almost be considered as a fluid itself. It is very necessary to notice this peculiar difference between carbonate and bicarbonate of lime, as it is wholly accountable for the trouble now under discussion. The former, which we speak of as chalk, consists of lime having a certain quantity of carbonic acid gas held in combination with it, and this substance is, as just explained, but sparingly soluble in water. Bicarbonate of lime consists of precisely the same materials, but the quantity of acid gas is exactly doubled, and this renders it highly soluble in water.

It will now be understood that the supply of this hard water is confined to districts where chalk abounds in the soil, and the degree of hardness naturally varies with the nature of the ground. In the South of England, including London and many counties south of London, nearly all the water is more or less hard, but in the north of England the water is of quite a different character, and hard water is, to a great extent, unknown.—so much so that vast quantities of boilers (for kitchen ranges) are made without manilla or any means of removing any incrustated deposit.

When a new boiler is first charged with this hard water and sufficient heat is applied, the result is to drive off the proportion of acid gas, which goes to make the carbonate into bicarbonate of lime, and the latter is transformed into the former again, and, being insoluble, it is precipitated, forming a thin film or coating upon the inner surface of the boiler; this precipitation does not wholly take place immediately heat is applied, but proceeds slowly until boiling takes place and steam is formed, when the chief precipitation is effected. It is almost needless to add that the greatest quantity of deposit is found at that part of the boiler where the greatest heat is felt, but this may be more fully entered into when describing boilers.

The deposit which is effected when using a boiler but once is a very minute quantity, but when we remember that the same water does not stay in the boiler (when the apparatus is at work) more than a few moments, and fresh



water is being continually brought to the heated surface by reason of the circulation, we can then understand why the deposit seems to accumulate so rapidly, especially as the heated and (wholly or partially) softened water is being continually drawn off for domestic uses, and entirely fresh takes its place.

This would be a fitting opportunity to explain that with boilers used for heating purposes only the deposit occasions no trouble whatever, as the same water is used over and over again, and a given quantity of hard water will only yield a certain amount of lime deposit, however long it may be boiled; of course, in a heating apparatus there is a certain loss of water by evaporation from the filling cistern, but this does not usually amount to more than about a quart per week, as the water is not allowed to attain boiling temperature. But in a domestic supply apparatus the quantity of water used does not usually come under 400 gallons per week, and in many residences, perhaps, a thousand or more gallons in this time.

The average hardness of London water is about 16 per cent., and a range boiler in regular daily use will have a  $\frac{1}{2}$ -in. deposit of "fur" within it after six months use. No rule, however, can be laid down to ascertain at what rate the deposit accumulates, as, although it is easy to find out the degree of hardness of the water, the result is chiefly governed by the efficiency or non-efficiency of the boiler in its heating capabilities, whether the water is nearly always boiling, or whether it seldom reaches this temperature; and again greatly by the quantity of water used, as every drop of fresh water introduced (to replace that drawn from the taps) has its portion of lime to deposit.

In the counties south of London, particularly Sussex, the water is very strongly impregnated with lime, so much so that an ordinary-sized boiler will commonly become sufficiently incrustated in from twelve to eighteen months to bring about its fracture. See fig. 3, which is the section of a boiler badly furred.

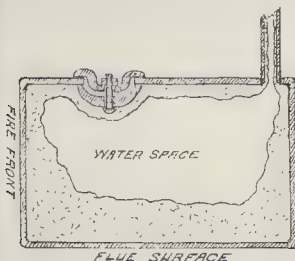


Fig. 3.

The ill effects of this furring consist firstly (and most especially) in its causing the boilers to become fractured before about an eighth of their natural life of service has expired; secondly, a comparatively thin coating of deposit will materially lessen the rapidity with which the water heats, as it is such a poor conductor of heat; and, thirdly, the deposit also locates itself in the pipes, at first retarding the circulation, and eventually causing a stoppage, and becoming an element of danger unless attended to.

The deposit partakes of a variable degree of hardness or solidity, that which is the most dense causing the boiler to fail the earliest, and that which is most porous permitting the boiler to render the longest service. With the different London waters the deposit is of a fairly similar character, being very dense and, in many instances, closely resembling ordinary limestone; and when this has become of about 2 in. in thickness (about two years use, usually) it is sufficient to prevent the water having any contact with the boiler-plate, with the result that the iron is destroyed by the action of the fire, the same as if the boiler were empty. In instances where the deposit is of a more porous or of a scaly character, it naturally requires a thicker deposit to bring about this result.

The failure of the boiler always shows itself in the form of a small crack or fissure (fig. 4), not a hole in the common sense of the word; and this fissure is rarely larger than 1 in. in length by  $\frac{1}{8}$  in. in breadth, for the simple reason that so soon as the fracture takes place water proceeds from it in a greater or less quantity, and this prevents the fire being ignited,

and without the fire, of course, no further damage can be done.

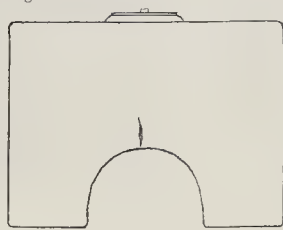


Fig. 4.

There are two remedies for this trouble, one being to soften the water by removing (i.e., precipitating by chemical action) the lime in solution; or, secondly, by having the "fur" removed at regular periods.

The first hardly comes within the province of these papers, yet it might be mentioned that whatever process is adopted, the softening must be done in a separate cistern, as it would not do to have the precipitated lime carried into the service pipes which run from the house cistern, and each supply of fresh water must be operated upon; and it must be borne in mind that softened water is not agreeable for every purpose, although it may be beneficial to boilers.

The best remedy and the least expensive is to employ a workman to clean out the incrustated deposit at regular periods. This remedy is, perhaps, sometimes a source of inconvenience, owing to the fact that when this cleaning takes place the kitchen range cannot be used, and, under the most favourable circumstances, this work cannot be done in less than two hours; with some ranges it takes more than a day. The time occupied is to a great extent governed by the amount of trouble experienced in removing the manlid of the boiler. Special means should be provided to make the lid easy of access and removal; but more than three-fourths of the kitchen ranges in the market have no provision of the kind, and the range has to be dismantled and partly unset for the purpose of exposing the boiler manlid.

In "cleaning a boiler," as it is called, the workman has first to get at the lid of the boiler, then to unfasten and remove it; the "fur" is then loosened with a chisel or other suitable instrument,—workmen often have some fancy tool of their own for this work,—after which it is removed by the hands and the lid repacked and fastened, and whatever parts of the range have been removed, replaced. Of course, the quantity of "fur" that has to be removed will govern the time the work occupies to some extent, but the most troublesome cases seldom take more than two hours after the lid of the boiler is removed.

In London and its suburbs it is found advisable to clean the boilers every six months regularly, in some instances they may be permitted to go twelve months; but it must be borne in mind that the oftener the boiler is cleaned the longer will be its term of life or service, and the less quantity of fuel will be needed to heat the water. A good plan is to have the boiler opened after six months of ordinary use, and a glance will determine whether this period is a proper one for having it cleaned; but in Sussex or in other localities where the water is very hard, the period for first inspection should be reduced to three months; but a person about to build or purchase a house in a district of which he has no experience, can always make profitable inquiry from those already resident there. It should be borne in mind that filtration will not remove lime in solution.

**THE ENGLISH IRON TRADE.**—The English iron market has been somewhat quieter this week, but it has maintained its general steadiness pretty fairly. Pig-iron is not in very active demand. Glasgow warrants and Scotch makers' iron have been fairly steady, and the decline in Cleveland pig amounts to only 6d. per ton. The better rates secured for pig-iron in Lancashire and the Midlands are keeping up. Hematite iron in the North-west of England is decidedly quiet, and quotations have dropped 2s. a ton. Finished iron is irregular in price here and there, but, on the whole, steady. There is more depression in steel, the consumption, particularly of ship-plates, having fallen off considerably. The outlook for shipbuilders is not improving. Engineers continue to work steadily.  
—Iron.

## OBITUARY.

**SIR EDWIN CHADWICK.**—Sir Edwin Chadwick died on Saturday last, in his 81st year. In our leading article we have referred at length to his life's labours. The funeral took place on Wednesday at Mortlake Cemetery. The mourners and friends present included Mr. J. L. Kennedy, J.P., D.L. (brother of Lady Chadwick), Mr. and Mrs. Kennedy, nephew and niece), Mr. and Mrs. David Ainsworth, Mr. Albert Greg (nephew), Mrs. A. Greg, Mr. Von Fischer, Mrs. Hasle, Mr. Melean, Dr. Richardson, and Dr. Marshall. Earl Fortescue, Dr. Richardson, Sir R. Rawlinson, K.C.B., Dr. A. Carpenter, Dr. Gordon Hardie, Major Lamorock Flower, of the River Lea Conservancy, Mr. Hugh Alexander and Mr. S. Legg, representatives of the Association of Public Sanitary Inspectors, of which the deceased was chairman, and Mr. Robert Kempt (private secretary to the deceased). Mr. Osbert Chadwick, son of Sir Edwin, is at present in Hong Kong, engaged on Government engineering works.

Mr. P. B. COGHLAN.—Mr. P. B. Coghlan, C.E., superintendent of the Waterloo Grain Warehouses, Liverpool, died suddenly a few days ago at his residence, Eghampt. Deceased, who was 80 years of age, was formerly Borough Engineer of Sheffield and Margate. He had been in the service of the Mersey Docks and Harbour Board for many years.

## GENERAL BUILDING NEWS.

**THE ROYAL COLLEGE OF MUSIC.**—The Prince of Wales, as President of the Royal College of Music, on Tuesday laid the foundation-stone of the new College buildings, to be erected at South Kensington. This step has been rendered possible by the munificent gift of £5,000, by Mr. Sanson Fox, of the Leeds Forge, and the concession by the Corporation of the Exhibition of 1881 of a portion of what once formed the grounds of the Horticultural Gardens as a site for the building. The designs have been prepared by Sir Arthur W. Blomfield, A.R.A., in the Renaissance style, freely treated, and the structure will be faced with red brick, with bands and dressings of Weldon stone. The site, which is 200 square feet in extent, lies immediately between the Albert Hall and the Imperial Institute, and will have a new road passing its northern front.

**CHESHAM CHURCH.**—A Consistory Court has been held at Llandaff Cathedral, before the Worshipful J. E. Olivant, M.A., Chancellor, to consider an application made by the Rev. E. J. Hensley, vicar of Chesham, and the churchwardens, who propose, under plans provided by Messrs. Seddon & Carter, to restore the twelfth-century nave and lower it to its original level, to rebuild and extend the chancel, to restore and rebuild the transepts, to build new aisles on the old foundations, to remove the organ to the west gallery, and, consequently, to open up the tower arch and west window, together with the external restoration of the tower. The estimated total cost is £4,250. In granting the faculty the Chancellor sanctioned the removal of two Beaufort monuments, which date from 1640, from the north to the west side.

**THE VAUDEVILLE THEATRE, STRAND.**—We hear that this theatre, which was opened in 1870, is about to be re-fronted, and altogether remodelled as regards its interior, under the direction of Mr. C. J. Phipps.

**THE SPIRE OF ST. CATHERINE'S CHURCH, PONTYFRIDG.**—The spire, about 75 ft. in height, is to undergo extensive restoration. The framework and wall-plates at the bottom having perished, must be reinstated; all the slates removed, framework strengthened, and the whole spire newly slated. Four new stone gables are to be constructed on the lower part of the spire, in which will be placed a clock. The work of restoration, which will require much care, and will cost about £500, has been entrusted to Messrs. Kempton & Fowler, architects, Llandaff; Messrs. W. Thomas & Co., West Butte Docks, Cardiff, being the contractors.

**SCHOOLS, COLESHILL (WARWICKSHIRE).**—The foundation-stone of a girls' school at Colehill was laid on June 26 by Mrs. Wingfield Digby. The estimated cost of the building is £54. The builder is Mr. Green, of Colehill, and the school will have accommodation for 100 pupils.

**NORFOLK AND NORWICH HOSPITAL.**—At a meeting of the Governors of the Norfolk and Norwich Hospital on the 28th ult., it was announced that a citizen, Mr. B. E. Fletcher, had offered, as a family memorial, to build and furnish a home for convalescent patients who had been treated in the hospital.

**NEW CHURCH AT LLANDAFF YARD.**—The little hamlet of Llandaff Yard (near Cardiff) was in a state of unusual activity the other day, the occasion being the laying of the foundation stone of the new Church of All Saints, by Mrs. Lewis, of the Palace, Llandaff. The Rev. J. R. Buckley, Vicar of Llandaff, presented Mrs. Lewis with a silver trowel, and Mr. Thomas, of the firm of W. Thomas & Co., West Butte Docks, the contractors, handed her a mallet, with which she laid the stone. The building, which is to be completed by November next, is to accommodate 250 persons. The cost will be about 1,600l. complete. Messrs. Kempton & Fowler are the architects.



**SUGGESTED NEW HOSPITAL AT MANCHESTER.**—At the monthly meeting of the Manchester Infirmary Board on the 30th ult., the minutes of the committee contained a report on the subject of the medical and surgical arrangements, adopted after a conference between a sub-committee of the committee and a sub-committee of the Medical Board. The report stated that the proposals were that, piece by piece, the existing Infirmary should be demolished, and in its place that a new hospital should be built capable of containing 500 beds. Nevertheless, the sub-committee of the House Committee believed that, now there was a possibility of a new hospital for 100 or more beds being shortly built adjacent to the Owens College, the moment would be inopportune for appealing to the public for funds for the extension of the Infirmary. The minutes containing the report were adopted.

**CHRIST CHURCH, ENDELL-STREET, ST. GILES.**—It will be remembered that this church was struck by lightning while service was proceeding on the night of Wednesday, August 17, 1887. The damage was serious and considerable. The spire was shattered, and scarcely any part of the edifice escaped. The County Fire Office, in which the church was insured, undertook to rebuild the spire, the cost of which work amounted to 1,616*l*. A careful survey of the whole building was made, and it was found that a large sum must be expended to arrest the rapid decay of the fabric and make good the serious dilapidations that existed. An appeal was issued, and over 2,000*l* was placed in the hands of the Committee. Mr. R. E. Tyler, F.R.I.B.A., was instructed to prepare plans, contracts were obtained and accepted, and the work has been carried out, but 150*l* is required to extinguish the debt, and for this an appeal is now made. The church was re-opened on Sunday last.

**TOWN HALL, HANLEY.**—At a special meeting of the Hanley Town Council on June 24, it was resolved to affix the corporate seal to an application to the Local Government Board for permission to borrow the sum of 3,750*l*, required for the completion of the Town Hall.

**SCHOOLS, MIDDLESBROUGH.**—On Monday last, after the ordinary business of the Middlesbrough School Board, the foundation stone of the Grange-road Schools was laid by Mr. Alderman Hugh Bell, Chairman of the Board. The buildings, which will cost upwards of 22,000*l* (including the site), stand upon a rectangular plot of ground, having frontages to Albert, Grange, and Duncing-roads. Accommodation is provided for 1,225 children. A department for the teaching of cookery is one of the scheme; there is also a caretaker's house. In connexion with each department there are covered playyards and private rooms for the teachers. The buildings, which will be fire-proof throughout, are of brick, with pressed brick facings and red stone dressings, from the quarries at Corncockle, in Dumfriesshire. The style adopted is a free translation of the Renaissance. The ventilation will be by fresh warm-air inlets and exhaust air-pump ventilators. Open fireplaces are provided for auxiliary heating. The grates and mantel-pieces are supplied by the Burmanoff's Works, Leeds. The architect for the buildings is Mr. J. Mitchell Bottomley, of Middlesbrough, whose design was selected in competition, under the adjudication of Mr. E. R. Robson, the Clerk of the Works is Mr. T. Todd, and the Contractor for the whole of the works is Mr. Joseph Lort, of Middlesbrough.

#### SANITARY AND ENGINEERING NEWS.

**THE SANITARY INSTITUTE'S EXAMINATIONS FOR INSPECTORS OF NUISANCES.**—An examination for Inspectors of Nuisances, held under the auspices of the Sanitary Institute at Bristol on June 27 and 28, sixty-two candidates presented themselves. Questions were set to be answered in writing on the 27th, and the candidates were examined *vide voce* on the 28th. The following candidates were certified to be competent, as regards their sanitary knowledge, to discharge the duties of Inspector of Nuisances:—Anon, A. Bath; Boddows, J. Sheffield; Bralley, F., Leicester; Brook, J., Stratford-on-Avon; Brown, E., Burgess Hill; Cook, W. G., London; Cooper, J. G., Birmingham; Foad, C., London; Fitzgerald, W., Birkenhead; Harverson, W. W., London; Hassell, H., Bristol; Hughes, E. J., Birkenhead; Johnson, J. E., Bridgend; Jones, J. M. W., London; Jones, S. E., Newport; Mon, J., Kirely, H. J., Bristol; Knapp, R. W., Christchurch; Little, W., Carlisle; Lind, C., Southport; Mills, W. S., Tellington; Pennock, J., West Hartlepool; Perry, C. W., London; Roberts, P. J., Aylesbury; Sasse, A. J., Bristol; Suttie, A., Otley; Sydenham, S., Bath; Taylor, H. J., Sturminster Newton; Taylor, H. T., Liverpool; Thompson, F. W., Tottenham; Thorley, W. F., Southsea; Trigg, H. J., South Haring; Weeks, A. J., London; and Willboud, G. B., Nottingham.

**SEWAGE TREATMENT AT LEICESTER.**—We are informed that the Corporation of Leicester have given an order to the International Water and Sewage Purification Company to supply twenty tons of ferrocene per week for precipitating and decolorizing the sewage. This is, we understand, the third year in succession that the complex sewage of this populous centre of manufacturing industries has been treated with ferrocene.

**SURVEYORS' INSTITUTION HIGHER SPECIAL SANITARY SCIENCE EXAMINATION.**—We understand that out of five candidates for the first of these examinations, Mr. Philip Edward Filditch, of Parliament-street, S.W., was the only one who satisfied the examiners.

**ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.**—A home district meeting of this Association is to be held at Croydon on Saturday, July 19. After the transaction of district business, the members will visit the South Norwich Irrigation Farm. They will then proceed to the Addington Hills (covered concrete) Reservoir, and will inspect the interior, which will be lighted for the purpose. They will then drive to Addington Well, where they will inspect the pumping machinery at work. Here a paper by Mr. Walker, upon the "Public Works of Croydon," will be discussed.

#### FOREIGN AND COLONIAL.

**LAUSANNE.**—The authorities consider it advisable to have a complete design for the proposed group of public buildings (mentioned on May 31) worked out in accordance to the ideas shown by M. Demierre, of Paris, whose work was classed third in the late international competition.

**ZURICH.**—The municipal authorities having notified their intention of presenting the "Theater-Aktiengesellschaft" with a fine site on the Dufour-place, on which the new theatre will have a very dignified position, and at the same time having directors of the above company been asked a Viennese firm of architects to have the building erected with all possible speed in accordance with designs submitted by them some time ago. According to the contract the building is to be opened in November next.

**BERLIN.**—The preparatory sketches for the proposed buildings for the Prussian Landtag (see p. 33, ante) are to be worked out at once. A special committee, consisting of members of both the Prussian "Houses," has taken the matter in hand. The necessary vote of money is to be asked for next session. According to the official *Reichs Anzeiger*, the designs for the new museum buildings to be erected on (or in close proximity to) the so-called "Museum Isle" of Berlin are now under consideration of the architectural division of the (workmen) after having passed safely through the first stages of bureaucratic criticism. The first buildings are to be erected in connexion with those already in position. The first will hold the antique collections, the second will be known as the Renaissance Museum, and the third will be solely devoted to the extensive collection of casts. Of these three buildings, the first two, designed by Professor F. Wolf and Hofbausch, 1890, respectively, will be placed on the island proper; the third will be erected on the other side of the water in accordance with the designs of Baurath Schwechten. The newly-elected "Rektor" of the Royal Technical College, Geb. Rath Rouleaux (of the mechanical engineering division) entered office on the 1st inst., the usual installation ceremony taking place. Professor Jacobsthal (of the architectural division), who held the post for the year 1889-90, will now be "Professor," Professor Schäfer (Gothic) has been elected head of the architectural school.

**CANNES.**—Two rival schemes for the sanitation of the town have been submitted to a Sanitary Commission presided over by M. Crodde, Honorary Ingénieur des Ponts et Chaussées. The system proposed by M. Hourlier has been accepted. He proposes to use the existing drain system discharging into the bay for the surface water only, and to have a new system of soil drains connected with reservoirs and pumping stations, at which the sewage will be raised and taken by a new line of drain to the sea at a point four kilometres distant from the town.

**BREMEN.**—The municipal authorities have voted 16,000*l* towards the erection of a public library building. According to the present catalogue over 60,000 volumes will have to be housed.

**NEW BUILDINGS AT BOMBAY.**—The Bombay, Baroda, and Central India Railway has hitherto been without a building of its own for its administrative offices. This want is now to be supplied by erecting a handsome edifice on a vacant plot of ground facing the Church Gate Station of that railway. The building will not be as grand nor as better ventilated from its situation on the western foreshore of the city. The building is intended to accommodate also the office of the Government Consulting Engineer for Railways.—*Indian Engineering.*

**DISCOVERY OF ANCIENT FRESCOS IN DENMARK.**—Prof. Kornum has discovered some interesting old frescos on the walls and in the dome of the ancient church of Vigstered in Seeland. The subjects are biblical. There are also two paintings by Knud Lavard, said to be of great historical value.

**PARIS.**—The Municipal Council has added a subscription of 500 francs towards a monument to General Faidherbe at Bayonne.—M. Paul Brasse has brought before a Committee of the Municipality for the construction of cheap and sanitary artisans dwellings for Paris.

**STOCKHOLM.**—The death is announced, at the age of forty-nine, of Professor P. M. R. Isen, of the Stockholm Technical High College, and one of the foremost architects in Sweden. Herr Isen was the architect of some of the most prominent buildings erected in the Swedish capital in recent years, and also entrusted with the building of the Great Northern Museum to be raised in Stockholm. He recently sojourned in this country for professional purposes.

**RUSSIA.**—The Perekop Sea Canal between Asow and the Black Sea will now be taken in hand. According to a Russian contemporary, the new canal will be 110 wersts long, will have an average width of 70 ft. and a depth of 12 ft. The capital (nearly 100,000,000 francs) has been raised by a company of Russian and French financiers. The works will take over six years to complete.

**GRANT TO A SWEDISH ARCHITECT.**—A Government grant has been made to a Swedish architect, Herr A. J. Lindgren, from the funds of the Academy of Fine Arts, for 1,000 kr., in order to study architecture in other countries.

#### MISCELLANEOUS.

**METROPOLIS MANAGEMENT AND BUILDING ACTS (AMENDMENT) BILL.**—In the House of Commons on Wednesday, Sir J. Lubbock, in moving the third reading of this Bill, said that it was a Bill of a highly technical, but happily not of a contentious character. The House would remember that it was referred to in Tuesday's discussion on the County Council (General Powers) Bill by several speakers as containing valuable provisions. It was unopposed on second reading, and having been carefully considered by a Committee upstairs, had passed through the Committee of the whole House without amendment. The Bill was read a third time.

**THE LONDON COUNTY COUNCIL (OMNIBUS) BILL.**—The General Powers Bill, promoted by the London County Council, passed through the Committee stage in the House of Commons on Tuesday, and, with the exception of the clauses relating to the representation of the Council on the Thames Conservancy, was agreed to and ordered for third reading. The Bill, as we have already pointed out, provides for a variety of things, among others, the acquisition of a bridge over Bow Creek, the acquisition of Brockwell-park, and the amendment of the Metropolitan Building Acts in certain particulars. Mr. R. G. Webster moved an amendment to expunge the building clauses, with a view to their transference to the Metropolitan Management and Buildings Acts (Amendment) Bill, but the amendment was negatived without a division.

**WATER AND SEWER MAINS OF GLASS.**—The firm of Messrs. Seume, of Prague, has introduced to the market water and sewer mains manufactured from glass, and having a coating of asphalt, one centimetre in thickness. They are said to be far superior to iron or clay materials, particularly in chemical factories, there being no incrustation.

**PROFESSOR HERKOMER AND THE INDUSTRIAL CO-OPERATION.**—Mr. Herkomer, R.A., has designed a Certificate of Merit, to be awarded to successful exhibitors in the Home Industries Exhibition, which will be held in connexion with the Third Great National Co-operative Festival at the Crystal Palace in August next. It represents "The Spirit of Success holding up the warning finger of one hand whilst it holds the laurel-wreath in the other. It rewards (although backed by the Wheel of Fortune) only true merit." These are the artist's own words descriptive of the design, which consists of a single female figure, seated at the portal of a temple, the steps of which form her throne. The certificate has been admirably reproduced in photography by Messrs. Annan & Swan.

For the coming Exhibition the Prize Schedule includes 526 prizes, for all kinds of technical and amateur work, for men, women, boys, and girls.

**THE EXPANSION OF PORTLAND CEMENT.**—In the course of some experiments recently made to determine the coefficient of expansion of Portland cement, it was found that an admixture of calcined magnesia and subsequent reburning increased the amount of the expansion to a considerable degree; and this expansion was more rapid in summer than in winter. Samples of the cement were immersed in water containing 0.6 per cent. sulphate of magnesia (nearly three times as much as in the water of the English Channel), and the expansion was greater than in the case of pure river water. It has been found by a series of comparative experiments that a normally burnt and imperfectly burnt Portland cement that the latter increased more rapidly in volume than the former when immersed in river water; if, however, a dilute solution of magnesia was substituted, the ratio of expansion was reversed. For fuller particulars on the expansion of Portland cement the reader may refer to the experiments of MM. Léon Durand, Claye and Paul Debray, see "Annales des Ponts et Chaussées," vol. xiv., p. 810.

**CHANGE OF NAME.**—As will be seen by an advertisement in our columns, Mr. H. D. Appleton, F.R.I.B.A., past President of the Architectural Association, has changed his surname to Searles-Wood.



**A NEW MATERIAL FROM WOOD-PULP.**—Some interesting particulars come to us from America of a new preparation of wood-pulp, which, if it bear out all the promises made for it, should prove of great value in many branches of industry. It is said to be thoroughly impervious to either water or acids in a very marked degree. The following is given as the method of manufacture:—Boards of spruce wood are first beaten into pulp. Pitch is altered in an electric bath, so that its nature is altered and it becomes fit for mixing with the pulp in a proportion of one of pitch to twenty of pulp. This mixture is next beaten in water heavily charged with electric Robur. The pulp is then ready to press, in rough moulds, to any required form, such as palls, wash-basins, &c. The partly-formed article is next laid in another more exact mould, in which it is vulcanised at a temperature from 325 to 350 deg. Fahr., and the process is complete. The material is said to have a tensile strength of about 900 lbs. to the square inch. It is uniform in density and will take a high polish. It can be machined like metal, is a good insulator, and will not melt or burn after being withdrawn from the fire, although it will carbonise when in contact with flame.

**AN ILLUSTRATIVE WORK ON "PAYSAGES ET MONUMENTS DUT POITOU,"** by J. Vassaux, by subscription, by the Ecole des Beaux-Arts, Paris. The illustrations consist of photographs or héliogravures after photographs by M. Robuchon. The work constitutes a monography of the monuments of the districts of La Vienne, Deux-Sèvres, and La Vendée, composing the ancient province of Poitou.

**APPOINTMENT.**—The Local Sanitary Committee of the Borough of Wandsworth, at their meeting on Monday last, appointed Mr. Walter Craven, of Wandsworth, to the vacant post of Inspector. There were 48 applicants.

**THE CARPENTERS' COMPANY'S WOOD CARVING COMPETITION.**—The second competition for carving and art wood work held at the Workshop of the British and Foreign School of Art in London, was just taken place, and it is reported that in the number of exhibits and in the quality of the work shown there was a marked improvement on last year's competition. Money prizes to the amount of nearly 600 were awarded, besides medals, and the company hope that with these competitions, the School of Wood-carving they have established at Chapel-street, Bedford-row, a fresh impetus will be given to the art of wood-carving in this country. The following were the successful exhibitors:—E. H. Atkins, awarded silver medal for a chair; T. Jacob, bronze medal for a table; G. Mason, 3d. for a truss; A. Hooyduyk, 2d. as a special prize; W. Clayton, 5d. for fruit and flowers; Osmond, 3d. for panels; J. Journaux, 2d. for ditto; Bruidert, 2d. ditto (special prize); Rowell, 1d. 10s. ditto; Edith M. Holt, 1d. 10s.; P. H. Peach, 10s.; C. Wilson, 10s. To competitors under eighteen years of age:—H. Grinawood, 2d.; A. E. Halliday, 1s.; C. Nott, 1s. The next competition is fixed for the year 1891, and the syllabus will be ready in the course of this month.

**THE BIRKBECK BUILDING SOCIETY.**—The thirtieth annual meeting of the Birkbeck Building Society was held last week at the offices, Chancery-lane. The report adopted states that the receipts during the year ended March 31 last reached £1,967,11, making a total from the commencement of the Society of more than one hundred and thirty millions (£122,247,107). The deposits were 7,937,167, and the subscriptions 209,125, and the gross profits amounted to 263,671. The surplus funds have been augmented by 376,899, and now stand at 4,534,340, of which 1,645,150 is in Consols and other securities guaranteed by the British Government. The balance in the hands of the bankers is 463,698. The Permanent Guarantee Fund, 125,000, and the temporary reserve, 138,671, (invested in Consols), represent more than a quarter of a million (£263,671) in excess of the liabilities of the Society. The subscriptions and deposits withdrawable on demand amount to 5,024,760. The surplus funds invested in convertible securities are sufficient to pay the depositors 11½ per cent. The new accounts opened during the year are 9,230, and there are 56,315 shareholders and depositors on the books.

**THE OFFICE OF MASTER OF WORKS, GLASGOW.**—The Special Committee of the Glasgow Town Council who have been entrusted with the duty of considering the arrangements in connexion with the appointment of a successor to Mr. Carrick, the City Architect, have held a meeting, over which the Lord Provost presided, and appointed a sub-committee to inquire as to the whole organisation of the office of the Master of Works.

**PARIS EXHIBITION, 1889.**—Sir Henry Trueman Wood, the late Commissioner Delegate for the British section of the Paris Exhibition, has received information that the diplomas and complimentary medals for the British exhibitors will not be likely to be issued before the end of October next.

**DRAWING IN ELEMENTARY SCHOOLS.**—The Executive of the National Union of Teachers, at their meeting on Saturday, according to the *Daily News*, agreed to recommend to the Education Department and the Science and Art Department that in order to encourage the teaching of drawing the requirements above Standard IV., particularly with regard to solid geometry and model drawing, should be reduced so as to be adapted to the capacity of the children. They further agreed to recommend the Science and Art Department to take steps to secure greater uniformity in the practice of local inspectors in the drawing examination, and that absolute freedom of classification in this subject should be in no way restricted.

**NATIONAL GALLERY.**—By a combination of private generosity with a large contribution from the Chancellor of the Exchequer, a Holbein, a Velasquez, and a Moroni from Lord Radnor's collection have been purchased for the National Gallery and thus prevented from possibly going out of the country. It is to be hoped this will form a precedent for future action in the same spirit.

**Vauxhall Park, South Lambeth-road,** was opened by the Prince of Wales on Monday last. It has been acquired at a cost of 45,000, and has been laid out by the Kyrle Society. The house of the late Professor Fawcett has been left standing.

## LEGAL.

### DEMOLITIONS IN GOLDEN-LANE.

At the Clerkenwell Police-court, on the 3rd inst., Mr. James Rowlands, M.P. for East Finsbury (accompanied by Mr. Benn, of the London County Council), applied to the magistrate for advice.

Mr. Rowlands stated that a number of houses between Goswell-road and Golden-lane, St. Luke's, had recently become in such a bad condition that the owner was obliged to have them pulled down. The tenements in question were in White-street, Crown-court, and Green Arbour-court, St. Luke's. The landlord had given notice to quit in the ordinary way to several tenants, but they were all very poor people and many had failed to secure other lodgings in time. An extension of time was refused by the landlord, who had the tiles taken off the roofs and the gutters removed, thereby exposing the tenants to the inclemency of the weather.

Mr. Horace Smith (the Magistrate) asked if the houses were pulled down by order of the County Council.

Mr. Rowlands replied in the negative. Mr. Horace Smith thought it would have been better if the landlord had proceeded under a Magistrate's order to eject the tenants. He did not see how he could assist the tenants.

The applicants thanked the Magistrate and retired.

## MEETINGS.

### SATURDAY, JULY 12.

**St. Paul's Ecclesiastical Society.**—Visit to Coventry The Churches, Monastic remains, and other objects of interest, will be inspected under the guidance of Mr. W. G. Fretton, F.S.A. Train leaves Euston at 3.30 a.m.

### SATURDAY, JULY 13.

**Association of Municipal and Sanitary Engineers and Surveyors (Home District Meeting at Crofton).**—Paper by Mr. Walker on "The Public Works of Crofton." **Glasgow Architectural Association.**—Visit to Kinning Park Catholic Church, Fairfield Offices (Messrs. Honeyman & Keppie, architects), and Govan Church.

## RECENT PATENTS.

### ABSTRACTS OF SPECIFICATIONS.

**10,235.**—**OPENING AND CLOSING DOORS.** *H. Harris.*—Sliding doors, which slide back into the wall or into a casing, are provided according to this invention, with rollers running on rails at top and bottom. A vertical sliding bolt is fitted in the floor, and being forced upward by a spring lock the door when in position; but electric communication and control is so adjusted that on a panic or when desired all the bolts are withdrawn simultaneously, and the doors opened automatically.

**10,333.**—**KILNS.** *A. Thormalley.*—This invention claims to be an improvement in Hoffman's brick-kilns, made by means of passing the waste heat from the burnt bricks through a continuous flue upon the top of the kiln, over the burning chambers, and through the green bricks. By this method no coal fires are required for drying the bricks before firing or burning.

**11,449.**—**ORNAMENTAL WOODS.** *J. G. Moreton.*—Upon the surface of the wood to be decorated in imitation of inlaying with coloured woods, cuttings of the pattern are according to this invention cut with a fine blade and cutter. By thus severing the fibres of the wood any number of stains, dyes, or paints may be used within isolated areas, which always turn away from the wind. The stains will not run beyond the area cut around.

**11,959.**—**CHIMNEY COWL AND VENTILATOR.** *J. Stenner (and others).*—A revolving curtain actuated by a single large vane which the revolving body is the chief feature of novelty in this invention. The curtain encloses the vertical louvers of the exhaust fan for some two-thirds of their circumference, and is guided by the vane, so that its opening is always turned away from the wind. A very slight wind or occasional current is sufficient to set the apparatus in action.

**19,181.**—**DOWLS.** *M. Moore.*—The cowl which is the subject of this invention comprises essentially an inner T-shaped cylindrical chamber, the vertical leg of which joins the top of the chimney or of the ventilating-shaft, and the horizontal head of which is closed at one end by a larger diameter at the open end to a smaller diameter at the closed end, which then tapers to a point. An inner chamber is an outer one of greater diameters

at the ends; an annular space is between them, and the cowl is turned by the wind-vane. The air is diverted into this annular space, and issues with sufficient force as to cause by suction an upcast current in the inner chamber sufficient to counteract the return of the smoke or back draught.

**17,441.**—**CEMENT KILNS.** *W. A. Gibbs.*—Improved methods of hydration of the material, and the substitution of metal coils for the water-jacket are the principal points of novelty claimed for this invention.

**NEW APPLICATIONS FOR PATENTS.**

**June 23.**—9,718, J. Vassaux, Reciprocating Saw-frames or Machines.

**June 24.**—9,757, T. Metham, Timber-dog.—9,771, F. Illigworth, removing "burr" from wood, &c.

**June 25.**—9,889, E. Hatton, Ventilating Apparatus.—9,850, F. & C. Wilkinson, Humidifying the Atmosphere in Factories and Buildings.—9,864, H. Landis, Dressing, Sharpening, and Setting Saws.—9,876, J. Bayly, Trap for Sewers.—9,883, G. Kindall, Anti-sash Rattlers.

**June 26.**—9,986, G. Tweedy, Binding the tops of Brick or Stone Chimneys, and Fixing Chimney-pots thereon.—9,997, J. Gordon, Making White Pigments of Lead.—9,911, T. Peake, Self-closing Gudgeon or Hinge for Iron and Wood-gates.

**June 27.**—9,958, J. Mosley, Apparatus for Humidifying Air.—9,973, J. Scammell, Level and Plumb Rule.—9,976, J. & P. Hughes, Lamps or Hand Stoves for Burning oil Paint.—9,977, R. Hickey, Detached Ventilator for Windows.—9,989, W. Wood, Die or Mouthpiece for Brickmaking Machines.

**June 28.**—9,990, M. Halachik, Ventilating.—10,027, J. Shanks, jun., Water-closets.—10,038, J. Bayly, Porous Earthenware Building Material.—10,043, E. Girdwood, Chimney Tops or Ventilating Terminals.—10,050, W. Drayson, Water Closets.

**June 30.**—10,114, N. Camusat, Hook or Support for Roofing Slates.—10,121, G. McLaughlin and J. Crankshaw, Scaffolds for Building Purposes.

**PROVISIONAL SPECIFICATIONS ACCEPTED.**

6,356, H. Tuke, Metal Plate used in the Manufacture of Bricks.—6,771, E. Wethered, Fastening Windows.

7,775, H. O'Brien, Smoke Cook.—8,178, E. Hand, Hot-water Heating.—8,234, W. Birch, Retaining and Releasing Device for use with Lock-bolts and Latches of Doors.—8,404, E. Ross, Traps for Street Gullies.—8,413, J. Brindle, Artificial Stone.—8,634, W. Cockburn, Securing Door-knobs to their Spindles.—8,839, J. Burde, Window Fastenings.—8,855, J. Bayly, Sash Fasteners.

8,887, J. Brindle, Locks.—9,143, H. Girdwood, Ventilating Rooms and Buildings.—9,254, J. Walker, Window Sash Fasteners.—9,246, H. Holland and W. Carter, Sash Fasteners.—9,440 and 9,441, H. Schlund, Hinges.

**COMPLETE SPECIFICATIONS ACCEPTED.**

**Open to Opposition for Two Months.**

10,254, M. Finn, Casts for Cement &c.—11,145, H. Johnson and T. Wilson, Inlet Ventilators for Sash Windows.—11,336, R. & H. Burk, Workmen's Time-keeper or Recording Apparatus.—12,257, A. Illidge, Sash Fasteners.—13,009, J. Wilson and others, Fire-resisting Partitions and Walls of Buildings.—13,203, J. McMahon, Preventing Decay in Wood.—1,820, H. Gurney, Kiln for Bricks and Tiles.—3,793, S. Flavel, Cooking Ranges and Fire-grates.—7,023, J. Rosewater, Fireproof Tanks.—7,427, R. Knickerbocker, Brick-making Machine.

## SOME RECENT SALES OF PROPERTY:

### ESTATE EXCHANGE REPORT.

**JUNE 30.**—By *Weatherall & Green*: 50, Brook-green, Hammersmith, c. 1,960, l. 14, Bridge-rd., c. 48 yrs., gr. 8s. 3d. 32d., and a l.g.r. of 5d., u.t. 4s. 9s. 8d., 130th-rd., Clapton, u.t. 87 yrs., gr. 6d., l. 26l. p. 130l.; 2 and 4, Downall-rd., Leyton, l. r. 44l. 4s. and 6, Westdown-rd., u.t. 89 yrs., gr. 6d. 4s. r. 82l. 10s., including mortgage, 480l.—By *F. N. Turner*: 4th, Thornel-rd., Lambeth, u.t. 70 yrs., gr. 6d., l. 42l., 358l.—By *Walker & Runtz*: 9, 10, and 11, Basinghall-st., City of London, u.t. 25 yrs., gr. 15s., r. 1,522l. 18s. 8,000; Well-st. l.g.r. of 180d., u.t. 67 yrs., gr. 6d., r. 65l. 10s. By *R. Tidy & Son*: 4 and 5, Crowland-rd., Islington, u.t. 47 yrs., gr. 9d., r. 80l. 840l.; 21 and 23, Church-rd., Kingland, u.t. 28 yrs., gr. 9d., r. 68l. 560l.; 10, Kings-rd., Brownwood Pl., u.t. 69 yrs., gr. 16s. 1, 726l.; 20, 22, 49 to 53, Queen-rd., u.t. 69 yrs., gr. 6d., r. 308l. 2,420l.—By *Prothero & Morris*: 1 to 7, Arlington Villas, Leytonstone, l. r. 260l. 3,240l.; a Block of Fruit Land, Hainault-rd., 220d.; "Bolly Lodge," "St. Ronalds," and "Holmerot," l. r. 185l. 2,540l.; "Howard Villa," l. r. 44l. 600l.; Two Plots of Land, Drayton-rd., 360d.—By *Exerton & Breach*: 1 & 2, Richmond-vil., Norbiton, u.t. 79 yrs., gr. 13d., r. 52l. 360l.; a plot of land adjoining 100l.; 15, The Grove, Hackney, c. r. 28l. 240l.; 29, Canonbury-grove, Canonbury, u.t. 27 yrs., gr. 6d., r. 32l. 265l.; 15 & 17, Welmore-st., Holloway, u.t. 18 yrs., gr. 6d. 6s., r. 48l. 28s. 180l.; 48, 72 & 74, Constance-st., Hoxton, u.t. 18 yrs., no gr. r. 120l.—By *Harman Bros*: 50, Spa-rd., Brompton, the Lease, u.t. 15 yrs., r. 500l. 3,372l.; 57, 59, 61, 63 and 67, Lamprill-st., Old Ford, u.t. 89 yrs., gr. 24l. 78s. 6d., r. 97l. 10s. 300l.—By *Reynolds & Eason*: 67 to 77 (odd), Canonb-st., Bethnal Green, u.t. 46 yrs., gr. 24l., r. 1,531. 66s. 1,120l.; 41, 43, 53, 55 and 57, Canonb-st., u.t. 46 yrs., gr. 20l., r. 150l. 3s. 955l.; 3 & 4 and 6, Clarkson-st., u.t. 46 yrs., gr. 16s. 565d.; 33l., Kingland-rd., u.t. 21 yrs., gr. 6d., l. 50l. 215l.

**JULY 1.**—By *Messrs. Foster*: The House "South Heath," Hampstead Heath, p. 160l. 3300l.—By *P. D. Tubbett & Co.*: F. r. 23d. p. 160l. West Hampstead, with reversion in 78 yrs., 720l.; l.g.r. of 34l. p. 4s. with reversion in 87 yrs., 2,610l.; l.g.r. of 25l. p. 4s. with reversion in 88 yrs., 780l.; l.g.r. of 19l. p. 4s. with reversion in 91 yrs., 600l.—By *Driver & Co.*: The Up Hall Estate, Brompton, l.g.r. of 99l. 3r. 1p. l. r. 15,000l.; the 2 residences "Heatherwood," Midhurst, Sussex, and 6l. acres, 3,600l.; King-rd., Camden Town, F. wharf, area 8,509 ft., 1,700l.—By *H. W. Jenkinson*: F. r. of 30l. p. 4s. Crown Land, with reversion in 98 yrs., 2,110l.—By *R. W. Nana & Son*: 2 and 3, Hobart-pl., Belgravia, u.t. 18 yrs., gr. 21l. 4,100l.; 5, Hobart-pl., and stabling, u.t. 18 yrs., gr. 21l., r. 360l. 4,500l.; 30, Elm Park-rd., Hrompton, u.t. 84 yrs., gr. 2l., 1,300l.—By *Jones, Lang, & Co.*: 6, 8, and 12, Arnauld-rd., Fulham, u.t. 82 yrs., gr. 7l. 0s. r. 96l. 745l.; the residence "Rose Villa," Auckland Hill, West Norwood, 700d.; 2 and 4, Orrell-st., Battersea, u.t. 55 yrs., gr. 12l. 12s., r. 76l. 8s., 500l.; l.g.r. of 14l. 14s., with reversion in 34 yrs., Montpellier-cy., Brompton, 475l.; 24, Montpellier-cy., l. r. 80l. p. 4s., 1,620l.; 2, Little Bath-st., Clerkenwell, l. r. 30l. p. 4s., 730d.







COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

CONTRACTS.—Continued.

Nature of Work.	By whom Advertised.	Prize.	Design to be delivered.
*Higher Grade School .....	Swansea (U.D.) Sch. Bd.	15 and 10 Guineas	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Clearance of Rocks of Buildings, &c., at Canterbury-road, Kent-road, S.E. for the Canterbury Christian College (Cambridge) Mission. Mr. Richard J. Lovell, architect, 46, Queen Victoria-street, E.C.	West Main Council.	Lewis Angell	July 15
*Repairs, St. Stephen's Church, N.wich. Painting Town Hall, &c.	Vicar and Churchwardens.	J. B. Pearce	do
*Station, Rye, Hastings, &c. York.	L. & N. W. R. Co.	Official.	July 16
*Steel Rails (7,000 tons).	G. W. R. Co.	do	do
*Hanging, &c. Corners of Court.	Manchester Corp.	do	do
*Repairs, Salford Works, &c. to W. H. & Co. C. W. R. Co.	do	do	do
*External Iron Structures.	Hackney Guardians.	do	do
*Peasmarsh Road Station.	Local Board.	do	do
*Fingest and Pass. & N. W. R. Co.	do	do	do
*Road Schools, Widdih, Shipley.	Hackney Union.	T. Dawson, C.E.	do
*External Iron Structures, Bromwood.	Westminster Vestry.	W. J. B. Bayly	do
*Wood Paving and Asphalt Works.	Conventry Machine.	G. R. W. Wheeler	do
*Cycle Paths, Coventry.	Fulham Union.	H. W. Chittaway	do
*Repairs, &c. Hot Water Heating Apparatus.	Altonham, &c. to Hall.	do	July 17
*Alterations, &c. to Werrington Church.	Rev. C. J. D. La Touche	do	do
*Powering, Paving, &c.	Gatehead Corporation.	do	do
*Sewerage, &c. South Moor, &c. Dunham.	Walsley Canal and Schools, Beverley.	do	do
*Walsley Canal and Schools, Beverley.	School Buildings, Bracknell.	do	do
*Additional Alterations to Durdley.	Buildings, Mortchell, Dufftown, N.B.	do	do
*Iron Cantilever Bridge.	Iron Bridge, &c. Steel Rails, &c.	do	do
*Painting Office, &c.	Landall Highway Bd.	A. & W. R. L.	do
*Dorset's Court, Mortchell, &c.	Cent. India Rly Co.	do	do
*Wood Paving and Asphalt Works.	Dunstable Rly. Bd.	do	do
*Duro Stone.	Newington Vestry.	do	do
*Broken Gravel, &c.	Whitland, &c. W. R. Co.	do	do
*Painting, &c. Baulston, &c.	Barnham Vestry.	do	do
*Painting, &c. Baulston, &c.	do	do	do

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Erection of Public Offices.	Willesden Local Bd.	E. Barker	July 22
*Steam Cooking Apparatus.	Brighton Guardians.	H. S. Read	do
*Repair of Filling, Balls, &c.	Islington Vestry.	Official	do
*Steelwork, &c. for Bridges.	See at state-1 India	do	do
*Low Level Sewer, &c. (Hills Drainage).	Belknap Corporation	do	do
*Repair of Private Roads.	Croft N. C. R. Station	do	do
*Pipe Sewer, &c.	Canterbury Vestry	do	do
*Colleges at St. Yves and St. Olave.	O. E. R. Co.	do	July 23
*New School House, Mitham.	Holborn Union	M. Saxon	do
*Repointing, Brick Walls, &c. at Infirmary.	Greenwich Bd. of Works	Official	do
*Engine House, Chisney, &c.	Admiralty Local Board	T. Penist	do
*Additions to Laundry, Horseway-road.	Islington Guardians.	W. Smith	July 24
*Laundry Machinery, Ho. way-road.	do	do	do
*Paragon, Velodrome, &c. (Hampshire).	Aberdeen Local Board	D. Jenkins	do
*Warehouses, &c.	Coop & Co.	Wm. Verity	July 25
*New Works, &c. at Workhouse.	Tisbury Union	W. Oakley	do
*Erection of Public Baths, &c. &c.	Bell's Corporation	C. L. N. Wilson	July 26
*Masonry Clock Tower.	Yewi. Corp.	G. J. Brown	do
*Barn, &c. at F. R. Station, Gt. Dunmow.	Northampton Union	do	July 28
*Vagrant Works at Workhouse.	Tisbury Local Board	H. B. Carter	do
*Water in Pipes, &c. &c. &c.	W. W. R. Co.	Official	July 29
*New Passenger Station, Ross.	Campton District L.B.	do	do
*Road Materials (500 tons).	South. H. A. Union	do	July 31
*Post Office, Kewbury.	Lower Town, &c. &c.	do	Aug. 1
*Road Materials.	Stables, & Stoneleigh Camp, Kentworth	do	Aug. 23
*Sewerage Works, Armadale, Ireland.	Messrs. Harley	John R. Smith	No date
*New Girded, Hollowed.	Salvation Army	W. J. Smith	do
*Periodical Painting, &c. Woolwich.	War Department	Official	do
*Painting and Repairing Urns.	Islington Vestry	do	do

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applicants to be seen.
*Inspector of Street Cleansing.	Birmingham Public Works Committee.	100 per week	July 19
*Inspector and Inspector of Nuisances.	Lower Beilston L. B.	100 per week	July 19
*District Waterers.	London C. C. & C. Co.	Not stated	July 21

Those marked with an Asterisk (\*) are advertised in this Number. Competition, p. 11. Contracts pp. 11, 12, and 13. Public Appointments, xvi.

LONDON.—For the erection of mission church, hall, &c., at Canterbury-road, Kent-road, S.E. for the Canterbury Christian College (Cambridge) Mission. Mr. Richard J. Lovell, architect, 46, Queen Victoria-street, E.C.

Ivory	£5,637 0 0
Greenwood & Son	4,530 0 0
Patman & Fotheringham	4,480 0 0
Coles & Son	4,430 0 0
Parmenter	4,347 0 0
Nightingale (accepted)	4,286 0 0
Turtle & Appleton	4,254 0 0
Johnson	4,252 0 0

LONDON.—For alterations and additions at 81, Avenue-road, Regent's Park, N.W. Mr. Richard J. Lovell, architect, 46, Queen Victoria-street, E.C.

Cole & Sons	1,172 0 0
G. H. & F. Bywaters	1,130 0 0
L. H. & R. Roberts	988 0 0
Boys & Co. (accepted)	957 0 0

LONDON.—For erecting St. Matthew's church-room, Wandsworth-road, Upper Chapel, for the Building Committee. Messrs. Mitchell & Butler, architects.

Building.	Boundary Wall, Gates, Roads, &c.
G. S. S. Williams & Sons	£2,555
Scriveners & Co.	2,308
J. Morter	2,254
J. Anley	2,239
C. Cox	2,227
Coldwell & Sons	2,216
Chesham & Sons	2,139
E. Rooms	2,101
McCormick & Sons	2,099

\* Accepted.

LONDON.—For alterations to No. 8, High-street, Camden Town. Messrs. Furniss & Thorpe, architects, 60, Kentish Town-road. No quantities—

Anley	£1,490 0 0
Voller	1,370 0 0
Gould & Brand	1,367 0 0

LONDON.—For new stabling and cart-shed, also alterations and repairs at "The Rotunda," Blackfriars-road, for Messrs. Alfred Lacey & Co., Messrs. Dunk & Bonfield, architects and surveyors, 9, Billiter-square, E.C.

Cole & Sons	£1,300 0 0
Ridg & Son	1,254 0 0
Sliff, Dover	1,630 0 0
George Munday & Son	1,626 14 0

LONDON.—For alterations and additions to 72, Crowder-road, and 4, Payham-street, Camden Town, N.W. for the Co-operative Bakery Society, Limited. Mr. E. Stone, architect, 19, Berners-road, Wood-green, N.—

Alterations.	Repairs.
W. Evans	£469 0 0
Nightingale	424 0 0
Gould & Brand	327 0 0

\* Accepted.

LONDON.—For additions to "Cypress Villa," Lewin-road, Streatham, for Mr. W. West. Mr. Ernest J. Wellman, architect, Brixton-Hill—

Holliday & Greenwood	£298 0 0
Johnson	257 0 0
Johnson	247 0 0
Basnett (accepted)	220 0 0

LONDON.—For alterations, repairs, &c., at The Broadway, South Hackney, for Mr. M. W. Shaw—

J. Wynne, Newington-causeway	£210 0 0
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\* Accepted.

LONDON.—For alterations at "The Oporto" Stores, Broad-street, Bloomsbury, for Mr. German. Messrs. Furniss & Thorpe, architects, 60, Kentish Town-road. No quantities—

Voller	£1,270 0 0
Beale	1,250 0 0
Anley	1,193 0 0
Gould & Brand	1,143 0 0
Drew & Cadman	1,139 0 0

LONDON.—For new show-rooms at Dorset Works, East-road, City-road, for Messrs. Doldridge Bros. Mr. A. G. Collins, architect, 52, Finsbury-pavement.

E. A. Roome	£483 0 0
T. Nixon	445 0 0
J. Godfrey & Son, Clapton*	444 0 0

\* Accepted.

LONDON.—For alterations to No. 98, Southgate-road, N.

Mr. John Hamilton, architect—	£371 5 0
Shurmer	369 0 0
Godfrey & Sons	347 0 0
Beale	298 0 0
Flaxman	238 0 0

LONDON.—For alterations to Nos. 16 to 23, Jubilee-street, E. Mr. John Hamilton, architect—

Beale	£2818 0 0
Hill	500 0 0
Barnett & Power	491 0 0
Shurmer	480 0 0
Godfrey & Son	473 0 0

LONDON.—For works at 1, Knaresborough-place, W.

Hare Bros.	£468 10 0
Co-operative Builders, Limited, Erixton	422 0 0

MOUNTAIN ASH (Glamorgan).—For the erection of an infectious diseases hospital, at Mountain Ash, for the Mountain Ash Local Board. Mr. John Williams, surveyor—

T. Morris	£1,630 0 0
M. Edmunds (accepted)	1,695 0 0

(Both of Mountain Ash).

NORTH WOOLWICH.—For new buildings and alterations and repairs, also foundations, settings, and flues to boilers, engines, machinery and plant, fence-gates, &c., at the factories of the Fowler-Waring Cables Co., Limited. Messrs. Dunk & Bonfield, architects and surveyors, 9, Billiter-square, E.C.

Geo. Munday & Sons, 8, Savage-gardens, E.C.	£9,462 17 0
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[Schedule of prices.]

SOUTH SHIELDS.—For building potting-house, forcing and greenhouses, at the new Cemetery, Harton, for the South Shields and Western Burial Board. Mr. Henry Gueres, architect, Albany-chambers, South Shields—

R. Allison, Whitburn (accepted)	£209 0 0
For Framing and Glazing Greenhouse.	do
Mackenzie & Moncur, Edinburgh*	170 0 0

\* Accepted.

TOTNES (Devon).—For the construction of small service reservoir, and providing cast-iron mains, &c., at Bridgetown, Totnes, for the Corporation of Totnes. Mr. J. C. Inglis, engineer, 4, Buckland-terrace, Plymouth. Quantities by Mr. E. J. Snow, Plymouth—

A. R. Debnam, Plymouth	£211 0 0
Shadlock Bros., Plymouth	183 0 0
W. Trevenna, Plymouth	133 0 0
Brook & Ash, Totnes	133 0 0
Laphorn & Goad, Plymouth	130 0 0
J. Salwood, Totnes (accepted)	112 0 0
J. H. Foaden, Ashburton	103 0 0

Main, &c.

Debam, Plymouth	£543 0 0
Shadlock Bros., Plymouth	253 0 0
Trevenna, Plymouth	440 0 0
Laphorn & Goad, Plymouth	343 0 0
Foaden, Ashburton	318 0 0
Matterface, Hoxton	276 0 0
Heath, Totnes	335 0 0
F. T. Distin, Totnes (accepted)	280 14 0

UPHALL (Lidlington).—For erecting forty-six workmen's houses at Uphall, for the Pumpherson Oil Company, Limited. Mr. James Davidson, architect, Coatbridge, N.B.—

W. & J. Donaldson, Edinburgh	£4,810 0 0
R. R. Gordon, Bathgate	4,687 6 8
W. Fairley & Sons, West Calder	4,450 0 0
W. & P. Murray, Coatbridge	4,388 12 6
F. Cooper & Sons, Musselburgh	4,382 7 10
John Maxwell, Falkirk (accepted)	3,916 6 1

UPPER CLATFORD (Hants).—For additions to and refitting of the parish church. Messrs. J. B. K. & J. P. C. Architects, 23, Southampton-street, Strand, W.C.—

G. Wheeler, Romsey	£1,135 0 0
H. I. Sanders, Southampton	1,098 0 0
H. A. Annet, St. Andrew	1,070 0 0
E. Carter & Son, Winchester	1,039 0 0
C. Grice, Goodworth-Clatford*	1,010 10 0

\* Accepted.

UXBRIDGE.—For sanitary work at "The George" Hotel, for Messrs. Salter & Co., Ltd., of Rickmansworth. Mr. C. P. Ayres, surveyor—

Brown & Son	£187 0 0
W. Cherry (accepted)	169 0 0

WALTHAM-CROSS.—For proposed new buildings at Waltham Cross, for Sir Henry Meux, Bart. Messrs. Marshall & Vickers, architects—

Larks & Son	£9,123 0 0
Heath	9,068 0 0
Perry & Co.	8,797 0 0
Bentley	8,750 0 0
W. Shurmer	8,307 0 0
Bell & Co.	8,293 0 0

WATFORD.—For new class-rooms, &c., at Beechen Grove Old Chapel, for the Trustees. Mr. C. P. Ayres, architect—

C. Brightman	£288 0 0
G. & J. Waterman	374 0 0
Andrews & Sons (accepted)	353 10 0

WATFORD.—For altering shop-front at No. 106, High-street, for Mr. C. P. Ayres, architect—

C. Brightman	£42 0 0
W. B. Neal	141 10 0
Clifford & Gough	140 0 0
T. Turner, Lim.	140 0 0
G. & J. Waterman (accepted)	137 10 0

WEST DRAYTON (Middlesex).—For erecting new offices and store for the Electrical Engineering Corporation, Limited. Mr. A. H. Heron, architect—

Kearley, Uxbridge and Kensington	£1,678 0 0
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\* Accepted.

WILLESDEN.—For the construction of a pipe sewer in Canterbury-road, Kilburn, for the Willesden Local Board. Mr. O. Claude Rolson, Engineer—

Killingbeck & Co., Camden Town	£432 0 0
N. & R. Robson, Kensington	423 0 0
E. Ballard, Hendon	417 0 0
Neave & Son, Paddington	409 0 0
J. Garton, Stamford-hill (accepted)	395 0 0

**HOBBS, HART,**  
**& CO. LIMITED,**  
**PATENT PROTECTOR AND LEVER LOCKS,**  
*For all Purposes.*  
**STEEL SAFES, STRONG-ROOM AND PARTY-WALL DOORS.**  
 Patent Clutch-Rebated Self-Closing or Folding Doors, for Theatres and Public Buildings,  
 As approved by the Metropolitan Board of Works (used in large numbers at Covent Garden Theatre).  
 Offices & Warehouse: **76, CHEAPSIDE, London;** *Manufactories, Wharncliffe Works, Arlington-st., London, N.*



# The Builder.

Vol. LIX. No. 2476.

SATURDAY, JULY 19, 1890.

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Plans of Mr. Lindsay's Design for the Sheffield Municipal Buildings .....	Two Single-Page Photo-Litho's.
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## Art in Sardinia and Judea.



OST readers will probably take up this work by Messrs. Perrot and Chiezep\* with a mental interrogation as to what is the connexion between the two countries principally named in the title of the book, and which we certainly are not accustomed to think of ordinarily in connexion with each other. The answer will be that the link is mainly furnished by the waters of the great inland sea which washes the shores of both countries: the sea which Horace, who knew nothing of the greater wastes of the Atlantic, and to whom the Mediterranean was the ocean, stigmatised as "disociabile," the element which separated mankind and interposed itself in the way of free intercourse. Architecture and archaeology tell a different story, and show that the Mediterranean has been in fact an assimilating agency in regard to the arts of the various peoples who dwelt on its shores, who were really closer together in this sense than if they had been separated by the same extent of dry land, which might have been occupied by tribes that opposed a bar to intercourse, or by jungles or forests far more impassable than the sea-water.

The "plan of campaign" of the authors, in fact, as stated in their opening page, was "to collect on the shores of the Mediterranean the scattered remains of Phœnician art, or rather industry."

The chief interest, however, of the chapters devoted to Sardinia consists in the illustrations of a class of monuments which appear to be peculiar to the island, though a relationship is subsequently traced between these and the form of rude towers still to be found in parts of Italy under the name of Truddi (Latin "Trulli"). Whether these rather similar structures really indicate any close connexion between the Sardinians and tribes living in Italy, the authors consider is a question which could only be solved after a more complete study and knowledge of the class of rude structures in Italy referred to.

As far as we can gather however from the authors' rather desultory and wandering pages, the theory which they have arrived at from a study of Sardinian remains is that there was a fringe of population round the coast of the island, in early times Phœnician, in subsequent times Roman, who left the remains of their art and monuments round the coast, but that there was an older race of inhabitants dwelling at the same time in the centre of the island, a kind of Highlanders, who retained their own customs and arts for a long period unaffected by influence from without. And this early population they regard as having originally crossed over from the African coast, from Libyan territory; the African coast being the nearest mainland to the south portion of Sardinia. In regard to topographical relation, this seems a probable theory, for in days when maritime navigation was tentative and uncertain, it may be pretty safely assumed that the question of distance of voyage was the most important factor in determining the connexion between one coast and another, and that it would be the nearest coast that would receive the earliest attention from an exploring population.

We must confess, however, that the argument as carried on in the book leaves so many points open to discussion, and is so discursive and inconclusive in its character, that it must be regarded rather in the light of interesting and imaginative speculation than of history; and it may be questioned whether in regard to the early history of Sardinia we can ever now get beyond this rather theoretical stage. The existence, at the Roman period or earlier, of a central tribe of inhabitants in Sardinia preserving an aboriginal form of life and of art and monuments, may however be accepted as pretty nearly a certainty; and those monuments, of which many are illustrated, are certainly very curious and interesting. A few of the illustrations we are able to reproduce here by the courtesy of the publishers. We have selected plans and elevations of two, which represent types of the simple and of the more complex forms; figs. 1 and 2, of the Nieddu Nùragh, representing the simpler type; figs. 3 and 4 the more complex; fig. 4, as will be at once perceived, is a restoration of the exterior, by the authors. "Nùragh" is the name by which these towers have long been known in the country, and concerning the derivation and etymology of which there have been controversies, to little purpose; we

quite agree with the authors that it was best to adopt the name in use, in describing them, rather than invent a new one. These nùraghs exist in great numbers in the interior of the island, and have for centuries furnished the peasants with building materials for their huts; a Vandalism of the past, which, the authors add, they regret to say is still going on in the present; a remark which may suggest a new field for the energies of the Society for the Protection of Ancient Buildings. In despite of this spoliation, La Marmora, in his work on Sardinia, estimated that there must be three thousand of these structures still in existence in a more or less ruined state; an estimate which the authors believe to be probably far short of the actual number. The detailed description of these we had better give in the words of MM. Perrot and Chiezep, or rather of the translator:—

The form of a nùragh is that of a truncated cone, built with stone blocks of different size, sometimes very large, narrowing towards the top. It probably terminated in a terrace" [for this there seems to be no evidence beyond the appearance of something like an external staircase in many of the structures; the top is, as far as we can discover, in all cases ruined]. "Some parts of the edifice are built with cut stones; but they are unheun, as a rule, and laid without mortar, the intervening cavities being filled up with earth, apparently thrown in with the hand. The only doorway is on the ground-floor, but so low that a man must creep in as best he can to reach a corridor seven or eight feet high, as low as the entrance in some places.

This occurs where some kind of division or door formerly stood, shown by existing archways which communicated with a circular hall or chamber six or seven metres high." [The section at A fig. 1 shows the meaning of this rather clumsily expressed sentence; there is a high passage, with a low door from the entrance and an almost equally low door into the central compartment. In some cases, however, as appears from other illustrations, the entrance passage, after passing the low external entrance, is continued at a uniform height into the central domed compartment."] The stonework is corbelled [in the central chamber], forming an oblong dome measuring four or five metres at the spring of the arch. This mode of construction is observable in the passage and side chambers, shortly to be described, where the stones slightly overlap each other so as to form an incline. A certain amount of care was bestowed on the [interior] facing, of which the stones are well cut and do not show the joints, enabling the eye to travel from the base of the wall to the extremity of the slope in a continuous line to the top, which is sufficiently narrow to allow of a single stone, sometimes of considerable thickness, to fill up the gap."

Some nùraghs have one story only, others,

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\* History of Art in Sardinia, Judea, Syria and Asia Minor. From the French of Georges Perrot and Charles Chiezep. Translated and edited by I. Gonino. London Chapman & Hall. New York: A. C. Armstrong & Son. 1890.

such as that shown in figs. 1 and 2, a second story, in which the arrangement of the ground plan is repeated above.

Although this appears to be the general scheme, the authors show us enough illustrations to bear out their remark that there is a great deal of variety in the details of the structures, no two plans being exactly alike, though all conforming to the same general type. There are some examples of what may be called agglomerated nuraghs, where the regulation central chamber with its low entrance is combined with other similar dome-like chambers in the same structure. A very peculiar example is the *Losa nuragh*, in which the plan is in the form of a triangle with the angles rounded off and the sides very slightly concave; internally there are three separate vaulted chambers besides the central one, each within a rounded angle of the triangle; but externally these divisions of the plan are not seen, the whole being resolved into this curiously-shaped castle or keep. A far more elaborate plan, of which there is no other similar example, is that of the *Ortu nuragh*, of which we give the plan and the authors' restoration. It consists, as will be seen, of several one-storied nuraghs grouped around a central three-storied one, and has all the appearance of a fortress with an outer range of bastions and a central keep.

What was the use to which these structures were put? It is impossible to look at the section of one of them without thinking of that of the Treasury (so-called) of Atreus, at Mycenæ, now undoubtedly accepted as a tomb; impossible to compare the one with the other without thinking of the Pelasgi and imagining that here we have their influence in two distant portions of the Mediterranean shores. The nuraghs have been by various writers supposed to be tombs, temples, and dwellings. The temple theory is pretty well disposed of by their number, which would almost give a temple to each family, according to the probable density of population, in some portions of the island. Our authors consider the tomb theory disposed of by the fact that unquestionable tombs, of quite a different type, exist in close proximity with the nuraghs, and argue that it was improbable that two different forms of tomb would be in use by the same people. A negative argument in the same direction is that no skeletons or objects connected with burial have so far been found in any of the nuraghs. Another theory has been that these were dwellings; against which M.M. Perrot and Chipiez urge that "it is impossible to admit that these natives, even supposing them to have been mere savages, can have submitted to live in houses deprived of air and light, where fires were not to be had with any comfort, since the smoke could only escape as in Greek huts, through the interstices left by the beams; where, summer or winter, no viands could be cooked, and where every time they passed in or out of the doorway, they must have done so on all fours." They therefore conclude that the builders of these towers lived in huts close to them, and used the towers for stores and for places of refuge when attacked. This seems to us a very far-fetched explanation. There is, in the first place, apparently not the slightest vestige of the said huts, which must surely have left some kind of trace behind them if they were so numerous. Secondly, all tribes who erect buildings to defend themselves from violence prefer to live in those buildings, not to keep them as a retreat in case of need; otherwise how are they ever safe from a surprise? And as to their being too rude to live in, anyone who did not know the facts would certainly say the same of the huts of the Esquimaux for instance, and of many other half-savage tribes. Our own conclusion is that these were the abodes of a very rude and savage people, constantly fighting, and each feeling himself unsafe except in a structure in which he was secure from surprise. There is really a strong analogy between the history of these and the early Scotch castles. The square towers of the

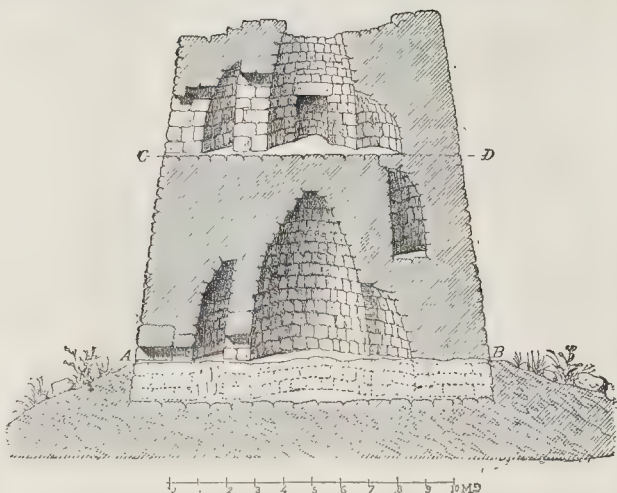


Fig. 1.—The Nieddu Nuragh, Sardinia.—Section.

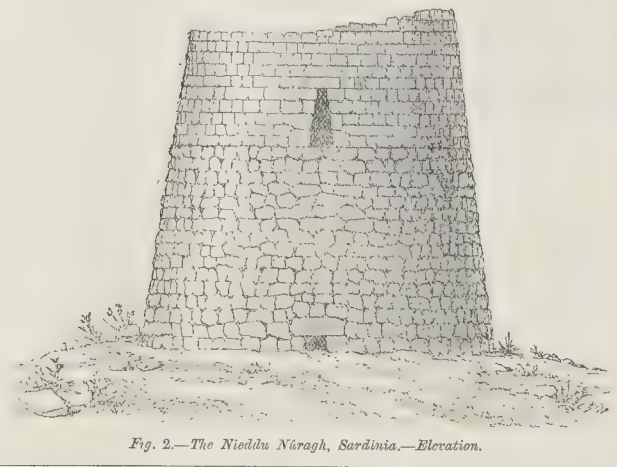


Fig. 2.—The Nieddu Nuragh, Sardinia.—Elevation.

later were most uncomfortable dwellings to our notions, but there is no manner of doubt that those who built them lived in them, and would not have felt safe otherwise. The nuraghs are only the same kind of thing in a more rude and primitive form, and our conviction is that the men who built them built them to live in, and would not have felt safe without them. Probably when they were not confined necessarily within them by a siege or an attack, they would use them only to creep into and sleep, spending the greater part of their lives in the open air. M.M. Perrot and Chipiez do indeed adduce the example of the towers built by the Italian families in the Middle Ages for security and retreat; but that was in a very different age—an age comparatively civilised. Our conclusion is therefore that these were really fortified dwellings.

The bronze statuettes found in the neighbourhood of the nuraghs may be held by some to militate against this theory; but they are in fact of the rudest and most barbarous description, the merest caricatures of statuettes that were ever illustrated, and so ugly that we hesitated to employ any of our space in reproducing one of them, even for purposes of illustration.

The portion of the book specially dedicated to Judæa includes a restoration by M. Chipiez of the Temple of Jerusalem according to the

description of Ezekiel. The connection of the subject with Sardinia is alluded to in the opening of the chapter. We have followed the Phœnicians, says the author, to the utmost limit of their adventurous track; we retrace our steps towards the Syrian coasts, and in that portion intervening between Phœnicia and the Valley of the Jordan, which we now call Palestine, we find a small people, owning the same blood and speech as the Phœnicians, whose place in the world was but a narrow corner, rendered important by the unparalleled part they played in it. A considerable historical account of the Jews is gone into, in order to realise the circumstances under which the temple of Ezekiel was built. To follow the author (M. Chipiez appears to be solely responsible for this portion of the work) through his reasoning from the description of Ezekiel to his restoration of the temple, would demand in itself a longer disquisition than we have space for. It is of the greatest interest, though we fear it must be accepted as merely problematical in character. The salient features, architecturally, of the restored temple show references both to Egyptian and Phœnician types of architecture; the Egyptian feature of huge and lofty pylons, finished with the Phœnician battlement. The principal illustrations are very finely-executed plates,



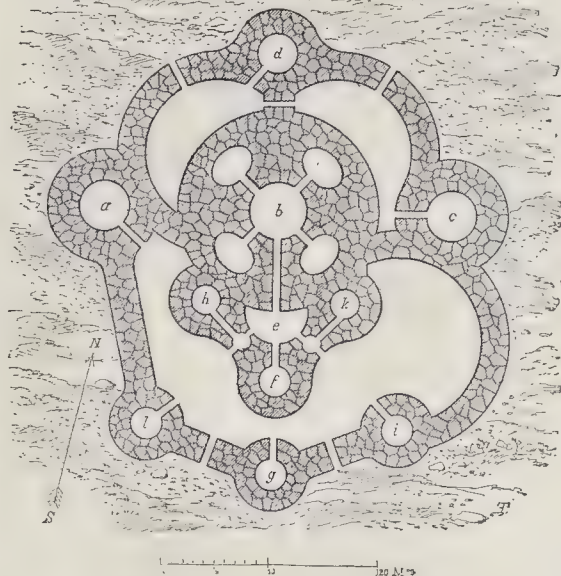


Fig. 3.—The Ortu Nùragh, Sardinia.—Plan.

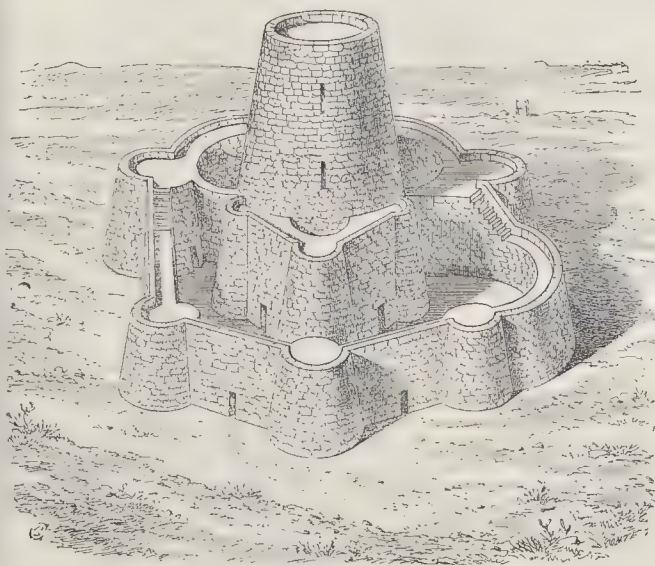


Fig. 4.—The Ortu Nùragh, Sardinia, Restored.

worked out with great care and in minute detail; we may devote some special attention to the restoration on a future occasion; we can only now refer the reader to the work for a chapter full of interest not only in suggestions of restoration, but for the number and variety of illustrations of various ancient architectural remains, which are all brought to bear upon the subject.

The second volume is mainly occupied with sites in Asia Minor, and is a storehouse of curious illustrations of carvings, in which elements both of Assyrian and Greek type seemed to be mixed together. It is from this portion of the work that we extract the interesting illustration of a rock-cut tomb at Alajah (figs. 5 and 6—see next page), which were dis-

covered by Hamilton as far back as 1835. As the authors remark, it is exceedingly difficult to date this monument, as it might either be due to Hellenic influence, or might be a primitive type borrowed by Asiatic Greeks. We should rather incline to the former belief, that it was an influence from Greek architecture, not a source of it. The connexion between Greek Doric and Egyptian is too marked to be mistaken, while on the other hand this shows elements which do not occur in Greek work—the base to the column, and the projecting astragal necking, for instance. From whatever point of view, however, it is a monument of great and curious interest. It would have been a convenient addition if a map of Asia Minor had been attached to the volume, to

enable the reader without difficulty to locate the sites mentioned as he reads.

The book in its English dress is very well got up, but cannot be said to be very well translated, owing apparently to English not being the native language of the translator, who occasionally uses words which are not English at all, as well as awkward and unidiomatic sentences and constructions. These faults are not very numerous, but these and the want of literary style detract somewhat from the pleasure of reading the book. In all essentials, however, it is a practically useful and adequate translation, and may bring before a larger circle of readers a treatise of rare interest and learning upon a most interesting section of archaeology.

#### PATENTS.

**F** works on the law and practice of letters patent in their technical sense, there is no end, and this last appears to surpass all its predecessors in size and in completeness. A *magnam opus* of this kind\* must always be received with respect and thankfulness. For if both our shelves and our pockets are unable to bear the burden of it, and we have to content ourselves with more moderate works, yet it will find a place in every important legal and technical public library. It contains not only a large mass of technical and legal information; it also deals with the subject historically; and we are thus able not only to find out in its pages the means of taking out new patents, of protecting old ones, and so forth, we are able also to follow by its means the evolution of English patent law. If we were to venture to criticise adversely a production characterised by so much industry, we should be tempted to point out that the book is somewhat prolix. It might have been equally clear and less wordy. Thus in regard to what is popularly called "the benevolent interpretation" of specifications, there appears to be an inclination to undue expansion. The term was invented to describe the tendency of the courts to construe specifications favourably to the patentee. This tendency appears so long ago as 1834, in a case decided by Chief Justice Tindal. It was not till 1876, and again in 1884, that it was reduced to its proper proportions. In this latter year Lord Justice Bowen stated the rules as to the construction of patents, showing clearly that all that was intended by the expression was that excessive formalism or shortness was not to prevail, and in 1886 Mr. Justice Chitty said that a specification "ought to be construed like any other legal document."

We cannot, however, but think that many of the expressions of these judicial ideas might have been passed over by Mr. Edmunds, and that it would have been sufficient to have given *in extenso* only one judicial utterance. Such a one is to be found in the words of Lord Chelmsford in 1876, who said:—"In the construction of a specification, it appears to me that it ought not to be subjected to what has been called a benign interpretation, or to a strict one. The language should be construed according to its ordinary meaning, . . . and if the specification is thus sufficiently intelligible, it performs all that is required of it." This is excellent sense and sound law, and no one patentee or lawyer wants more judicial utterances than this.

The way in which, after fluctuations, the recognised rule of law is arrived at by judicial dicta is well shown in this point of the construction of specifications. The whole subject teems with examples showing how this great body of practical law, as it may be called, has gradually grown up, partly by means of legislative enactments and partly by means of judicial decisions. More especially is this indirect growth noticeable in regard to two elements in the value of a patent, viz., its novelty and utility. Con-

\* The Law and Practice of Letters Patent for Inventions, with Patent Acts, &c. By Lewis Edmunds, Barrister, assisted by A. Wood Ranton, Barrister. London: Stevens & Sons, Limited. 1890.



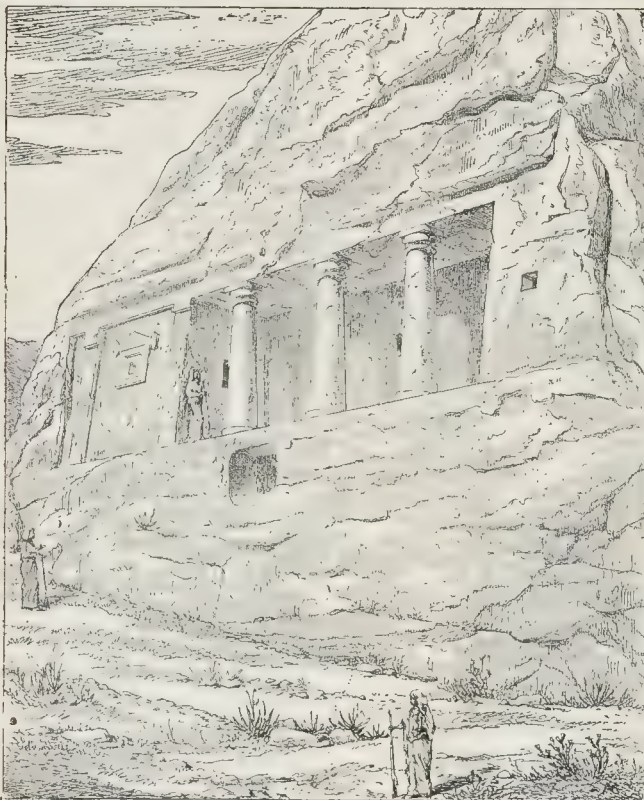


Fig. 5.—Rock-cut Tomb of Gherdek-Kaiasi, Asia Minor. (See preceding page.)

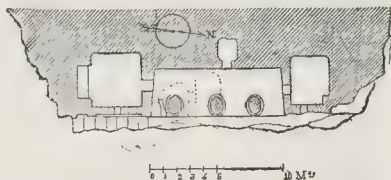


Fig. 6.—Plan of Gherdek-Kaiasi. (See preceding page.)

tinually, year by year, we have been obtaining a clearer idea of the characteristics of these two terms. Nothing is more easy to declare than that in the abstract an invention must be both new and useful, nothing is more difficult than to reduce into everyday use these compendious and elastic terms. For example, when we say that an invention must be a useful one, do we mean that it should be theoretically useful? The law has now laid it down that "utility means an invention better than the preceding knowledge of the trade as to a practical fabric. It does not mean abstract utility." Then again, pecuniary success in the result of the working of an invention is strong evidence of utility; and it must be shown that the subject-matter is vendable, otherwise, of course, the invention will not be used. Here we have some examples of the way in which the term "utility" has been illuminated from time to time. We might give instances of the same kind in regard to the term "novelty,"—where, indeed, the question is more complicated, because there must, to constitute novelty, have been no prior user, and thus we have to ask ourselves for the meaning of prior user

before we can arrive at an accurate view of the term "novelty." Thus it has been debated whether an experiment performed in the presence of others is a prior user of an invention, but it has been decided that it is not. If it had been it is obvious that a blow would have been struck at inventions in this country, for we have arrived at a period in the history of manufactures when most machines are complicated, and many are formed by the junction of new and old arrangements. Hence, semi-public experiments become very necessary. We have in this notice of this important work dwelt on one or two points interesting rather in regard to the history than the practice of patents; since we have from time to time noticed various purely practical works on the subject. The voluminous character of this book has afforded opportunity to point out the great interest and importance of the historical side of the patent law, and the nature of its growth. In these pages we may trace patents for inventions back quite to Mediaeval times, and see them occupying a large share of the attention of politicians in the seventeenth century. Their public importance has grown

year by year, until they form, it may be said, the basis of our manufacturing power, and a continual monument to the ingenuity of the human race.

#### NOTES.

**T**HE throwing out of the Central London Railway Bill by the Committee of the House of Lords is a matter of no surprise to us, though in some quarters it appears to have moved both surprise and indignation. The extensive use by the public of a railway under such new circumstances of construction and working, and at such a depth under ground, seems to us exceedingly problematical; and we are inclined to think that the promoters may really be grateful to the Lords Committee for restraining them from risking capital in an ill-advised enterprise. The opinion given in evidence by Mr. Penrose, who is a practical man and not an "aesthete," in regard to the possible effect of the proposed works on the foundation of St. Paul's, is not to be lightly passed over. Mr. Penrose admitted that if the tunnel were kept in the clay there would probably be no danger, but he believed the clay was at a great depth, and that it might prove impossible to keep within it, and if once they began removing the stratum of sand above it the consequences might be serious. Mr. Lewis, C.E., gave evidence as to the injury which had happened to the National Safe Deposit premises from the slipping of the clay itself. On various grounds the scheme seems to us to have been one of very doubtful wisdom, either in the interests of the public or of the promoters, and we think that the Lords Committee has acted for the best in opposing it.

**I**T appears that Sir A. Blomfield's examination of St. Saviour's Church, as now existing, preparatory to making the drawings for the proposed new nave, led to the discovery that a good deal more of the remains of the old nave are in existence than is generally supposed, and that a good deal, if not all, of the old foundations, and a considerable amount of the old walling, will be preserved and used in the new building. This, the architect argues, must settle the plan, and if that is settled the rest follows as a matter of course. This certainly throws a rather different light on the proposal to restore the Gothic nave.

**A**N opportunity occurs just now for making a much-needed improvement in Piccadilly, which may not occur again for a century. The valley through which the Tyburn runs in the form of a large sewer, and the hills on each side, especially the somewhat steep one opposite Half-Moon-street, are a great impediment to the traffic, especially in winter, when the wooden pavement is slippery. Many horses fall, and some serious accidents have occurred, but the chief difficulty is with the heavily-laden market-carts on their way to Covent-garden in the early morning, and which, to avoid the hill, make a detour through the narrow and otherwise quiet streets of Mayfair, much to the annoyance of the residents. Four of the houses in the valley, under one of which the Tyburn sewer passes, are now being demolished to make room for the Junior Constitutional Club-house, and if the ground-floor of the new building were placed sufficiently high to admit of the level of the street being raised about 2 ft. or 3 ft., the valley would practically disappear, and the ascent of the hills would be considerably relieved. The ground floors of the adjoining buildings, viz., the Savile Club, St. James's Club, and Hertford House, are reached by flights of steps, and are sufficiently high to admit of this alteration, and it is the old houses now being removed which have stood in the way of the improvement being made long ago, as is obvious from the raised footpath on the park side of the street, and the low level of their ground-floors. It is to be hoped that this very obvious and desirable street improvement will not escape the notice



of the architect of the new Club-house and the Vestry of the rich and carriage-using parish of St. George's, Hanover-square. The street-front of the new building will require to be set back somewhat, but this has doubtless received proper attention from the local authorities.

WE are glad to hear that, in order to make the Parkes Museum (which is supported by the Sanitary Institute) available to all classes for the purpose of obtaining information on matters relating to hygiene and sanitary appliances, the Council of the Sanitary Institute have resolved to throw the Museum open free at all times, except when meetings or lectures are being held. This is a step in the right direction. The Museum, we may add (for the information of some of our readers) is situate at 74A, Margaret-street, W.

IN a recent case the validity of Ryde's Scale as a customary rate of charge by surveyors was called in question. Although the plaintiff recovered the amount claimed, it was rather on the ground that this particular scale was in the contemplation of the parties as that by which the charges were to be regulated, than because of its validity as a customary charge. The fact is, that practitioners cannot too constantly bear in mind that a professional scale can hardly ever be proved to be valid by custom and apart from contract. It is scarcely ever possible to prove that it is so absolutely universal, so thoroughly recognised, as to be a legal custom. The forgetfulness of this over and over again causes disputes, which can always be avoided if this scale, or that, for example, sanctioned by the Institute, is brought to the employer's attention when the engagement is entered into. Men in every profession become so accustomed to certain common charges that very naturally they are apt to regard them as binding, when in law the only test of the propriety of the charges is their reasonableness. The physician who invariably obtains his guinea naturally, by force of habit, considers it legal, whereas it may be that were a cantankerous patient to dispute the charge and to show that it was more than the services were worth, it might be overthrown. An authorised scale may *prima facie* be regarded as a reasonable one, but the proper way to employ it is to bring it to an employer's notice in the first instance as a recognised rate of payment which he should sanction, and not to delay its use until the bill is being prepared.

A DECISION of the Court of Appeal of interest to patentees will be found in the current number of the "Law Reports" in the case of the American Braided Wire Company v. Thompson. It touches the question of damages when an infringer of a patent has by lowering the price of the pirated article compelled the patentee to reduce the price of his goods. The decision of the Court of Appeal was that the patentee was entitled to recover all the profits which would have been made by him if all the sales made by them and by the infringer had been made by the inventor at their original prices, after making an allowance for the increased sales attributable to the connexion and exertions of the infringer and to the reduction in the prices. By this decision patentees in similar cases will, as far as possible, be placed in a position of security. In a previous case a somewhat different rule was acted on, the patentee not being allowed the value of the original prices, because he had lowered his prices, not to compete only against the infringer, but also against third parties who, though not selling his patented articles, were selling articles which could be used for the same purpose.

MUCH attention is now being paid to the acquisition of ample and good church accommodation for the Berlin citizens, and, thanks to the activity of the newly-formed local "Church Building Society," which is under the immediate patronage of the Empress, numerous churches are being erected in different parts of the town, so that,

if this activity lasts, the church accommodation for the not very numerous church-goers of the German capital will be materially extended. No fewer than ten churches are in course of erection in different parishes, and of this number three have lately had their foundation-stones laid by the Empress with all ceremony, and another will be opened with similar pomp this autumn. Besides these ten, three other erections are already on paper, and two smaller ones for the suburbs will be commenced a couple of months hence.

We also hear that the above Society intend erecting a large church in memory of the Emperor William I., and that a competition for the designs of this building will be opened as soon as possible, so that it may be taken in hand next spring.

THE French seem very slow to perceive what one would have thought (in England at least) the most obvious desirabilities of sanitation. *L'Architecture* (which, be it observed, is the organ of the "Société Centrale des Architectes") publishes in its issue for the 12th an illustrated article on "Logements à Bon Marché," or, as we should say, "Artisans' Dwellings." Plans are given of a set in Rue Jean Robert, in which the water-closet opens out of the kitchen, nothing but the single door intervening: truly a delightful arrangement! English builders used habitually to place it in the bath-room, but this is ten times worse. We observe the author of the article seems a little doubtful about it, as he mildly remarks that "Cette disposition prête à la critique." We should think it did.

THE Annual Report for 1889 of the Working Men's College at Melbourne, which is before us, gives the idea that this is a very energetic and flourishing institution. A great variety of subjects are taught, and from the Report it appears that a great majority of the classes are largely attended. In regard to the class for instruction in gas-fitting and plumbing, for instance, we read that the only difficulty experienced has been from overcrowding of the class. Architectural drawing is the subject of one class, in connexion with which a course of lectures on Egyptian, Greek, and Roman architecture have been given. The classes in geometry, building construction, free-hand drawing, mechanical drawing, and modelling are all reported on very favourably.

WHAT is "Sloyd"? It appears from a little new magazine dedicated to the subject\*, to be a system of teaching the apt and ready use of the hands, preparatory to the acquiring of various handicrafts. Considering the inherent or hereditary clumsiness of the hands in the children of uneducated people, there seems every room for such a training, and it may be doing a very good work in preparing children for technical classes. The magazine, however, does not, so far, explain the system pursued; nor does it give the origin of its rather singular name.

THE Kyrie Society are appealing for funds to enable them to carry on their work of gratuitously decorating the homes of the poor, or rather schools, clubs, and hospitals, frequented by the poor. They say that "at the present moment twenty-two applications for decorative help have been inquired into and sanctioned by the Committee, but that not one of these can be put in hand, not from any lack of able artists and architects to draw up schemes or of workers to carry out their designs, but because the Committee has absolutely no money to grant for the necessary expenses of material and fixing, &c." Possibly their former subscribers are beginning to ask the question which we have asked once or twice, on what principle is gratuitous decoration to be given to the poor any more than gratuitous soup? The most active movers in the Kyrie Society are those who, in relation to such necessities of life as food and clothing, hold strenuously by the principles embodied

\* "Sloyd or Hand Craft": a Chronicle of Manual Training. The organ of the Home Sloyd Union.

in the programme of the Charity Organisation Society, viz.: that all mere charity, in the vulgar sense of the word, is demoralising, and only helps to foster the evils it professes to relieve. But if so, on what principle are the luxuries of life to be supplied to the poor gratuitously any more than the necessities? For the good intentions of the Kyrie Society we have every respect, but we fear their position is hopelessly illogical: and there is besides the question, where is this gratuitous decorating to end; where is the line to be drawn? That it must be drawn somewhere is certain.

WE referred last week to the old "Physic Garden" at Chelsea and the proposal of the Apothecaries' Company to sell it. This proposition appears to be regarded with apprehension by some of the inhabitants of Chelsea, who organised a meeting at Chelsea Town-hall for Wednesday evening last, to elect a Committee to attend to the subject and to prevent if possible the loss of an open space, and the sale of the land for building purposes. It is stated that the garden was presented to the Apothecaries' Company in 1721 by Sir Hans Sloane on condition that "it should at all times be continued a physic garden, for the manifestation of the power and wisdom and goodness of God in creation, and that the apprentices might learn to distinguish good and useful plants from hurtful ones," &c. If so, it appears rather contravening the terms of the bequest to sell it unconditionally. It has been suggested that it might be used as a botanic garden for study in connexion with one of the Polytechnic institutions of London, or that at all events it should be preserved as a garden and not built over; a suggestion with which we entirely sympathise. A constant struggle is needed to maintain the existing open spaces of London, and Chelsea is doing well in taking up the subject.

REQUIRED, the grammatical construction and precise meaning of the following extract from a letter signed "Grimthorpe" in the *Times* of Tuesday, about the old gateway of Lincoln's Inn:

"Sir,—The antiquaries and 'ancient building protectors' (by letting them go to ruin) are as accurate as usual in the statements they are publishing, wherever they can get a footing, about this gateway, and some chambers on another side of the square which nobody has proposed to meddle with, except Sir Gilbert Scott's general plan for gradually rebuilding Old-square, in which I understand there was not a brick party wall from one end to the other until we rebuilt most of it, not a year too soon; and even now there is none between the gateway and the old buildings."

At the close of his letter the writer speaks of finding "wrath for them (his archaeological opponents) and amusement for myself." To most readers it would appear that Lord Grimthorpe was himself so far in wrath at being foiled in his desire to pull down the Lincoln's Inn gateway that he could not even arrange his sentences intelligibly.

WE have received the following letter from a reader in India, in reference to Mr. Armstead's bas-relief monument now in the Royal Academy, and which was illustrated in the *Builder* for May 31:—

"DEAR SIR,—My little daughter, only just four years of age, but of an eminently practical turn of mind, as you may gather from what follows, has given me a poser, which I think the eminent sculptor concerned should hear of.

After studying for a short time the illustration 'Guardian Angel,' in your issue of May 31 last, she inquired: 'But how did the angel get its clothes on?' And I was forced to confess that I did not know how angels,—this one in particular,—managed with their clothes! I. I. I."

The question might have been added, how were its wings attached? But if the sculptor had shown an angel without either

The result of the meeting was that a resolution, moved by Mr. Westlake and seconded by Professor Flower, was adopted to the effect that "this meeting of the inhabitants of Chelsea and others, having heard that there is a probability of the old 'Physic Garden' on the Chelsea Embankment being no longer kept up by the Apothecaries Company, considers that every effort should be made to keep the garden an open space for public use." Lord Meath, Lord Monkswell, Professor Westlake, &c., and some others were elected as a committee for the purpose of watching the matter.



clothes or wings, would the little critic have believed that it was an angel at all? The child's question, however, is worth putting to sculptors and painters; the conventional idea of an angel as being clad in a nondescript long drapery and with wings mysteriously coming through the drapery is certainly foolish and illogical enough. Can they think of no better way to convey the idea of a superior being?

THE exhibition of sketches and studies at the Society of British Artists throws a curious light on the real nature of the present tendency towards unfinished and sketchy work in painting, which is practised under the name of "impressionism." Putting out of the question the studies by Sir F. Leighton and Mr. Burne Jones, which of course give a special interest to the exhibition, the remainder of the collection consists of sketches for pictures, mostly landscape, by the ordinary run of contributors to this gallery. Now it is remarkable that while the exhibition of the Society of British Artists has generally been a very dull and uninteresting one, this year it produces the impression of being interesting and bright; and the difference evidently arises from the fact that a great many of the exhibitors can produce effective and interesting sketches, but in the making finished pictures they spoil and reduce to commonplace their own beginnings. And that we take to be the whole mystery of impressionism, which is the work of artists of feeling and perception to a certain extent, who can sketch but cannot finish, and who try to persuade the public that the sketch is the real thing. While alluding to the exhibition, we should mention the records for Harrow Mission Church (502), the figures by Mr. Hamilton Jackson and the decorative portion by Mr. Lethaby, which is very fine, and which we have already referred to in connexion with a drawing of it in the Academy. Mr. Jackson's cartoons for the Baptistery window St. Alban, Acton Green, (513) should also be looked at, and Mr. Walter Crane's fine decorative panel entitled "Luna" (514).

THE circular from which the following quotation is taken, appears to refer to some new kind of extract ventilator (system Herelle-Leruste) patented by a French firm, and in this remarkable language brought by means of traduction before the English public:—

"INTERESTING ADVICE to Messrs. Washers, Dyers, Dressers, Brriers, Distillers, Founders, Owners of Iron, Mills, Directors of Gas-works, and of glass-works. In a word, to all owners of establishments where, steam vapour, smoke, stench, diffuse itself in of halls.

DISCOVERY NEWLY moveable summit and hats, suck and ventilator removing completely steam vapour, smoke, stench, in halls and workmen.

Patented in French and abroad unwarranted of the government.

This newly moveable being at the price very little high, comparatively to all means used till to day, giving very little of results can to apply it to all old and discovery beans, without not any trouble, and can be installed without disturb the workmen working in the establishments, and using not any repair at a better period.

Jingaze Messrs. manufacturers, to make application of it, they will find a great advantage because all know very well the inconveniences which result of it, when steam vapour, smoke, stench remain in halls. Direction, inspection of work very difficult production, be far from satisfactory, the machinery, the materials which be in those halls are always humid and get spoiled it very fast. With this moveable summit, house hold suffer much less and can respire without to apprehend of absorb gas or all, emanation coming of the different businesses. In a word, all the inconveniences vanish the halls are ventilated, and during the winter season it is less cold, than with all the systems used until to day, by against, during summer, heat is more temperate. The summit has not any affinity with these chimneys with funnel which can not take, remove all heat of the trough where they are set, very bad and expensive thing, and they remove not steam vapour which are spreading close by, for these chimneys. I have a moveable hat sparing all driving back."

It is a pity, as this "moveable hat" seems to promise so much in the way of ventilation, that we could not have had an intelligible description of it.

#### SOME RECENT PUBLIC WORKS AT EALING.\*

It is now some six years since I had the pleasure of meeting you in Ealing (shortly after the expiration of my term of office as President of the Association). The paper I then read was entitled "Twenty Years' Development of a London Suburb," and I am free to admit that it was with some degree of satisfaction I was enabled to point to the progress made between the year 1863, when the Board was formed for the better government of a country village, and the date of our meeting, 1884, when the country village had grown into a thriving suburb, its rateable value having gradually worked up from the comparatively small sum of 17,500*l.* to the somewhat more important figures, 118,000*l.* There were some who then felt that Ealing had reached its maximum, and might fairly rest upon the work done; but a London suburb, if it is to maintain its position, can know no rest—"Progress" is ever its motto. "Full steam ahead" the order of the day; and it was then being the policy of the governing body of Ealing from the day of its formation to the present hour.

Some five years ago circumstances pointed to the necessity of erecting an isolation hospital, and a very short period elapsed when a building, complete in every respect, was erected. Baths—which might also be used as gymnasium in the winter—next occupied attention, and eighteen months later saw them completed. The necessity for increased stable and store accommodation was felt, and the opportune moment was seized by the Board for carrying out these works. This happened in a most unexpected manner, by the acquisition of the splendid site of land upon which the buildings where we are now assembled are erected; and, I may add, the liberal owner gave me the opportunity of performing an act which does not often fall to the lot of a Local Board Officer. The land, with main road and side frontages, was valued at 3,000*l.* I was allowed to fix a price at which it should become the property of the Board. I did it by cutting off the last cipher—turning the 3,000 into 300*l.* I need hardly say that, the owner having expressed himself satisfied, the Board were gratified; and even those who did not see the matter quite clear at first, have come to the conclusion that the step was a wise one, the principal factor in this all-round success being the very important one, from a ratepayer's point of view, that the rates have not been increased one farthing. With a death-rate, upon a three year average, of only 11·5 per 1,000, with a loan account but slightly over one-half of the rateable value, and with a half-yearly rate of only 1*s.* 6*d.* in the pound (with a halfpenny for the Free Library), we have, to say the least, very much to be thankful for.

Turning now to the more immediate object of our meeting, I will give a short account of the circumstances which more immediately led to the erection of the hall.

No one who was present at the Jubilee celebration last year could well forget the enthusiastic way in which the day's pageant was carried out; few committees could outrival, and none surpass, Ealing in its unique demonstration. There were not wanting, however, spirits who, satisfied with the demonstration, yet regarded it as of too transient a nature to be satisfactory to the loyalty animating them. Bonfires blazed, fireworks fizzed on that glorious day in June, and the Jubilee celebrations might have been over. But that was not to be. On January 25, 1887, a very large and influential gathering of the inhabitants took place, and E. M. Neilson, Esq., F.R.P., the Chairman of the Board, who had been elected chairman of the meeting, explained a scheme for the erection of the present building upon land belonging to the Local Board, but which the Local Government Board, who had previously been in communication with them, had said might be utilised for the desired purpose. The result was that a resolution was carried with acclamation that a hall should be erected, and that, as suggested by the Local Government Board, it should be vested in the Local Board, as trustees for the inhabitants of Ealing; that the building should be used for the purpose of public meetings, balls, concerts, &c., and that the proceeds derived therefrom should be divided annually

amongst charitable institutions in the district. A committee having been appointed for the purpose of carrying the resolution into effect, subscriptions for the purpose of raising the necessary funds to build the hall were solicited. Mr. Nelson headed the list with the sum of 500*l.*, and the appeal was heartily responded to by all classes. The committee were consequently able to carry out the desire of the contributors, and in less than two years, viz., in December, 1888, his Royal Highness the Prince of Wales performed the ceremony of publicly opening the Victoria Jubilee Memorial Hall.

Concurrently with the erection of the hall, the Local Board built new public offices, also a suitable home for the free library. The latter institution had been located upon premises which were not so convenient or well placed as might have been desired, and it is a source of congratulation that a new and permanent building has been secured. The inhabitants of Ealing now have, upon one spot, in as near as possible the centre of the district, a block of buildings consisting of the Public Offices of the town, the Free Library, the Victoria Hall, the Baths, the Fire Station, the Stabling, and all other necessary adjuncts to the headquarters of a local authority, such as, it is believed, is scarcely equalled, certainly not surpassed, in any other town in the kingdom.

The New Public Offices, Free Library, and Memorial Hall.—The design of the buildings may be described as English Gothic, freely treated to meet modern requirements, the details of stone-work being mainly based on the geometrical period of Gothic work. The principal entrance, both to the public offices and the Jubilee Hall, is placed in the centre, and above it is a two-storied oriel window, corbelled out from the main wall, and terminated by a pierced parapet, which forms the central feature of the whole design. To the right of this central gable is the tower, which separates the Public Offices from the Free Library wing, the height of the tower from the ground to the top of the final being 135 ft. The Library wing itself is treated in a manner somewhat plainer than the public offices, and terminates in a hipped roof corresponding with a similar roof at the west end of the frontage, thus giving a symmetrical character to the design, as far as the varied requirements of the rooms would permit. The entrance hall has a double stone arching, on red granite shafts, and from this the level of the public hall is reached by the central staircase of massive stone. Turning to the left from the entrance hall is the hall-keeper's office, beyond this the general offices, inspector's and surveyor's office; and on the opposite side the drawing office and two plan rooms, the inner one being fireproof. To the right of the entrance hall are the rate collector's room, office of the Clerk to the Local Board, the Accountant's office, and a private staircase. There is a second entrance to the public offices, at the west end of the building—a stone staircase leading to the hall, gallery, &c. The first floor landing of the main staircase has an arching similar to that below, and on this floor are the Medical Officer's department, drawing office, and three committee rooms, waiting-room, and the board room, a spacious, lofty apartment, 45 ft. by 25 ft., and 21 ft. high. The features of this room are its open trussed roof, walnut dado, tracery windows, and oak boarded floor. In its rear are the members' cloak room, lavatory, &c. Ascending the back staircase from this floor is the way out to the whole of the roof, and to the record room and tower. The Memorial Hall—100 ft. by 45 ft., and 40 ft. high—has an open trussed, hammer-beam roof, elaborately pierced. From the west end of the building there are two entrances to it, with a staircase on the right, and another on the left. One of these leads to the lower hall, which is 48 ft. by 25 ft., and 14 ft. high, and beyond that to retiring and cloak rooms. In the basement of the offices are the caretaker's rooms, testing rooms, stores, and strong rooms. Here also are the kitchen, office lavatories, &c., and the heating apparatus. The Free Library is approached by a single doorway, similar to the double doorway of the main entrance; on the ground floor are the reference library, the dimensions being 33 ft. by 22 ft.; the lending department, 39 ft. by 20 ft.; and at the north end is the reading-room, 35 ft. by 26 ft. The whole of the area covered by these departments is half-basemented with two large glass rooms, for the science and art department, the centre being devoted to the library stores,

\* From a paper read by Mr. C. Jones, A.M.I.C.E., Surveyor to the Local Board, Ealing, before the Association of Municipal and Sanitary Engineers and Surveyors at their recent District Meeting at Ealing.



with a lift to the lending department. On the first-floor are two spacious rooms, respectively 23 ft., by 22 ft., and 15 ft. high; and, on the second-floor, a splendid studio, 22 ft. by 50 ft., and 14 ft. high to the ridge, having an open timber roof and abundance of north light. The walls of the buildings are of Kentish Rag, with Doubling stone dressings. The major portion of the woodwork used in the interior is polished American walnut and clean stained deal. The flooring of the corridors, hall, and landings is Diespeker's Roman mosaic. The roofing is of red Bangor slate and permanent green bands. Westphal's patent gas-lamps are used for lighting throughout, and the method of heating is by Bacon's high-pressure apparatus. The buildings have been erected by Mr. Hugh Knight, of Morden, Surrey, to the design and under the superintendence of the Surveyor of the Ealing Local Board. The loan raised for the Public Offices was 14,000*l.*; of this sum 7,000*l.* was paid off within twelve months, from the sale of the Old Offices; Loan for Free Library was 2,000*l.*; and 400*l.* for Librarian's cottage. The cost of the Victoria Hall was 5,000*l.*, including furniture.

**The Brigade Station, Stables, &c.**—At the rear of the baths, and parallel to the Great Western Railway, are the various buildings connected with the brigade and stable departments. Facing Longfield-avenue, and adjoining the railway bridge, is a red-brick structure with a tower at north-west corner,—the new Fire Brigade Station, accommodating steamer, manual, and hose-cart. There are rooms for resident fireman, also large bedroom, furnished for two volunteer firemen, who take it in turns to remain at the station during the night; there is an accommodation-room, also used as a reading-room for the brigade; underneath is a store-room. In the upper part of the tower is a large cistern; it can also be used as a look-out, and is so constructed as to form a drying-place for the hose, which is drawn up to its full length, and effectually drained after being used.

Adjoining, and forming part of the design of these buildings, is the yard foreman's residence. Passing through the entrance-gates into the yard, you have on the left a long range of buildings, the first are one story high, and consist of painters' and glaziers' shop, next carpenters' shop, and adjoining this the forge,—the latter being a wonderful "economiser" in an establishment of this description. Over these one-story buildings are three 2,000-gallon tanks, which are filled with water from the premises, and are used for flushing and road watering. Adjacent is a two-story building, the first portion of which is occupied by a gas engine, for cutting, chaff, pumping water, &c., also the sewer deodorising apparatus, which has been found very useful in years gone by. Over this department is a bed-room, occupied at night by a stableman, who is also connected with the fire brigade; thus giving a contingent of five men (including the yard foreman), all sleeping on the premises or fire brigade station. This block also comprises a nine-stall stable, plain but substantially built, well ventilated, and fitted with every necessary appliance; the drains are outside the stable. Over these stables are the lofts and corn room. In conjunction with this block is a drying-room, fitted with hot-air stove; in wet weather the collars, wraps, loin cloths, &c., are placed in this room, as soon as the horses come in, and in the morning are found dry and fit for use again. East of and adjoining this is another block—a one-story building, also containing nine stalls; there is one loose box in each stable. On the south side of yard as you enter the front gates is the road engine house, and in the rear of it a mortuary; the building, for 5 ft. of its height, is lined with white glazed bricks, and is fitted with the necessary appliances. Adjoining is a range of cart-sheds, a trap-house, and large room where men can cook their meals. I must not omit to call attention to the small paddock at the east end, nearly 200 ft. long, where a horse can be rested for a day or two, and yet remain under the eye of the foreman. This plot of ground also provides ample scope for enlargement of stable premises when the necessity arises. On the paddock stands the unpretentious donkey-shed. Our two familiar friends, who occupy the shed, perambulate the town all day long, performing the duty of street orderlies; they come to the yard five or six times a day, and deliver their loads, which are taken to the farm every morning with the ordinary stable manure. The small cottage adjoining,

and forming part of the block, is the residence of the librarian of the Free Library. The amount of loan for the whole of stable and Fire Brigade Department was 4,500*l.*

**The Baths.**—The block of buildings forming the baths is situate at the rear of the Victoria Hall. Being at no great distance from the Great Western Railway, special care had to be taken in order to prevent any difficulty arising from the tremendous vibration caused by the heavy broad-gauge trains. We are pleased to state that, although having to do with a very sandy foundation, no difficulty has been experienced since the opening of the establishment in May, 1886. Three separate swimming-baths are provided, viz., "Ladies," "first-class men's," and "third-class men's," the dimensions being as follows:—"Ladies": length, 60 ft.; width, 24 ft.; depth, 3 ft. to 5 ft. "First-class men's": length, 90 ft.; width, 30 ft.; depth, 3 ft. 6 in. to 5 ft. 9 in. "Third-class men's": length, 75 ft.; width, 25 ft.; depth, 3 ft. 6 in. to 6 ft. 3 in. Each of the baths is fitted with diving platform, steps, dressing-boxes, with seats, pegs, &c., for the use of the bathers. The doors of the dressing-boxes are half the height of the boxes, the top portion being screened by a curtain, which can be drawn back at will, thus giving a much brighter and lighter appearance than the usual full-height doors. In connexion with the ladies' bath a large retiring-room and lavatory have been provided, which forms a distinct feature of the scheme, and one which is much appreciated, as it is not merely an ordinary waiting-room, but one in which the friends of bathers, or a nurse in charge of children, can pass away the time whilst those whom they accompany are in the bath. By the ticket-office a room is provided in which the various clubs which make these baths their headquarters hold their meetings. The bottoms and sides of the baths are lined with white glazed bricks, relieved by dark blue lines and crosses, the whole having a very pleasing effect. Great care has been taken to guard against leakage, which has been a cause of serious loss and inconvenience at other baths, and for this purpose a bituminous composition was run whilst hot in a cavity between the glazed bricks and concrete wall, forming a lining thoroughly watertight. The passage-ways between the dressing-boxes and the edge of the bath in the men's baths are covered with lead laid on boarding (this I do not advocate), and finished at the side of the bath with Victoria stone kerb. In the ladies' bath, which has dressing-boxes on one side only, the passage-way is covered with encaustic tiles, and kerbed with Victoria stone. Considering it undesirable to keep the three baths open during the winter months, arrangements were made for using the first-class bath as a gymnasium, the gallery round the same affording accommodation for some 500 persons. There are now two large athletic clubs, who use the gymnasium during the winter months.

The engineering work in connexion with the baths was carried out by Messrs. Thomas Bradford & Co., upon a system which has given great satisfaction in the numerous public baths fitted up by them, and consists in the present instance of two 20 h.p. Cornish steam-boilers fitted in the basement, from which live steam is taken to each of the swimming-baths, and fed, by means of perforated copper pipes (which have the advantage of maintaining a regular heat at any desired temperature), to the entire bulk of water, by keeping up a perfect circulation peculiar to the system, and obviating the unpleasantness of the discolouration of the water. For the convenience of the bathers, and cleanliness, the baths are fitted with brass handrails and spittoons. The dressing-boxes are arranged round the several baths, and are heated by a steam coil passing along the entire length beneath the seats. The heating of the offices and waiting-rooms has been effected by steam radiating coils, which can be easily regulated to give any desired temperature. The laundry in connexion with these baths, used for washing towels, &c., has been carried out by the same firm. The laundry appliances consist of a Bradford's towel-washing machine, with rinsing, wringing, and boiling apparatus, and is worked by a 4-h.p. vertical engine, effecting a great reduction in the expenditure. The drying closet at the end of the wash-house is fitted with Bradford's improved draw-out drying closet horses, and is heated by a coil of cast steam pipe.

Little more than twelve months had passed when it was found necessary to erect slipper baths, and the first block was erected facing

the Longfield-avenue—still leaving ample space on the east side for a corresponding block when necessity shall arise. On the ground-floor there are six slipper baths; on the one pair, four first-class baths, and two rooms set apart for cabinet Turkish bath. There is a commodious waiting-room, and the various appliances for a first-class establishment have been provided. I need hardly say that the swimming-baths, slipper bath, and gymnasium, are very largely used; and the fact that the average takings during the four years that the baths have been in use have amounted to the sum of 875*l.* per annum, is a tolerably conclusive proof of the necessity for their erection, and the immense boon they are to the community at large. The amount of loan for swimming-baths was 8,800*l.*, and for slipper baths 1,500*l.* The cost for water is 220*l.* per annum.

#### THE ARCHÆOLOGICAL CONGRESS AT OXFORD.\*

FROM Merton the party made their way through "Logic-lane" and across the High-street to New College, where they were met by the Warden, Dr. Sewell, who addressed them in the College-hall afterwards, explaining the College, its buildings, and its ancient connexion with St. Mary's College at Winchester. He also led them round the College-gardens, and pointed out to them two of the remaining bastions of the old city wall, and the tower of New College, which was built for the double purpose of a chapel tower and a beacon on the city wall. Here, too, he showed them the course of the old city ditch on the east side of the town. The party was also shown the pictures and portraits in the Great-hall, the painted windows, and the statues of angels and saints on the screen over the reredos, which are now being gradually filled by presents from old Fellows and former members of the College. The cloisters, which are plain and severe in style, are still in good condition, though they are over four centuries old, and were much admired. As the party left the gates, the Warden pointed out to them the original sculpture of the Annunciation, which has adorned the upper story of the College-tower since the days of the founder, William of Wykeham.

After an interval for luncheon, the party re-assembled in the hall of Christ Church, where Dean Liddell, in spite of his eighty years, was in attendance to show to the party the College-hall built by Wolsey, the newly-restored, or, rather, newly-repaired chapter-house, once belonging to the Monastery of St. Frideswide, and the exterior and interior of the Cathedral. He pointed out in detail the various alterations and improvements in the fabric which had been made during his own tenure of the Deanery, by the removal of heavy wooden screens and opening up the old eastern window. Almost all this work was carried out under the guidance of the late Sir Gilbert Scott, and by Messrs. Bodley & Garner, whose work in raising the tower over the exquisite fan-tracery which covers the entrance to the College-hall he singled out for especial praise. The explanation of St. Frideswide's Chapel itself, and of her shrine or reputed shrine, and the alterations made in the north-eastern corner of the Cathedral, he left to Mr. J. Park Harrison to give in detail. But of these changes it is not necessary to say much here, as they have from time to time been recorded more or less fully in our columns. It is only right, however, to add that Mr. Harrison's excavations, bringing to light the triple apse of the old Saxon Church of St. Frideswide, were much approved and admired by the archaeologists.

Later on in the afternoon the party paid a visit to the New Museum of Natural Science in [the] Park, where the printed programme promised them the guidance and assistance of Sir Henry Acland, an old resident of Oxford.

In the evening two long and interesting papers were read before the Congress in the New Examination Schools, the former by Dr. J. S. Phené, F.S.A., "On some Striking Historical and Linguistic Features belonging to the First Thousand Years of British History, and attaching to the Neighbourhood of British Roads and Earthworks." The latter paper, by Mr. J. Gilbert, of Oxford, was an essay on the condition of the University of Oxford before the foundation of Colleges within its walls.

On Wednesday, the third day, in spite of a drizzling wet morning, over fifty of the

\* Continued from p. 29, ante.



archæologists went off by railway immediately after breakfast for Banbury, whence they drove in carriages and brakes to Broughton Castle, the seat of Lord Saye and Sele. It is, as is well known, a very fine specimen of a mediæval moated mansion, rising out of the greenest turf, with a noble entrance hall, and a private chapel of the Decorated period. On the roof it has a very singular and, indeed, unique watch-tower. This, it is needless to say, excited great curiosity. From the Castle they made their way to the parish church, which almost adjoins the outer walls of the former, and is particularly rich in monuments to members of the Fiennes and other families. From Broughton, in spite of the rain, they drove on to Bloxham, where they made a hasty examination of the parish church, and afterwards lunched at the hotel. From Bloxham they proceeded by road to Adderbury, and thence to King's Sutton, and, the rain having ceased, they inspected both those churches, which form, along with Bloxham, such a trio of noble and lofty spires as few neighbourhoods in England perhaps can show. At King's Sutton Manor they were entertained at afternoon tea by the resident squire, Mr. Willes. But they had to take their refreshments in haste, as it was necessary to catch the train at Banbury, and they made their return to Oxford in time for dinner; after which they again repaired to the new examination schools, where Mr. J. W. Grover, F.S.A., read a paper on "Sundry Excavations proposed to be carried out at Silchester." This paper was, or rather struck us as, somewhat visionary, as Mr. Grover laid it down that the discovery of a quantity of oyster-shells in the neighbourhood of Silchester, coupled with that of sundry Roman coins hard by, showed the presence of a large Roman settlement; but as some of the members present urged, the coins were an undoubted proof as far as they went, but that the oysters might well have belonged to a more recent date. In the course of his paper Mr. Grover stated that at Silchester the remains of a great temple had been discovered, although little had been done to thoroughly unearth it. He had no doubt that when a further examination had been made of the spot, the temple would in all probability be found to have been dedicated to the god Apollo or the Sun. Mr. Grover also mentioned that the discovery had been made of a house which was supposed to have been the house of a Roman chief magistrate, the remarkable thing about the residence being that it stood near the forum. Alluding amidst applause to the forum at Silchester, Mr. Grover said that they had what nobody had except at Pompeii. The building was 275 ft. across on one side and 313 ft. on the other. In the centre was a market-place 131 ft. by 141 ft., and there was a place in which the people could walk in wet weather, such as they had had that day. On the west side of the building was the basilica like Westminster Hall, but he found that the former was 18 ft. longer than the latter. The reading of this paper gave rise to a discussion, in which Mr. Hurst, Mr. Walford, and Mr. Birch took part.

It should be mentioned here that an account of Broughton Castle will be found in the *Builder* for July, 1888, when it was visited by the Congress of the Royal Archaeological Institute.

On Thursday (the fourth day) the party paid a visit to All Souls' College, where, in the absence of the Warden, Sir William Anson, they were met by Mr. Hurst, one of the local secretaries, who read to them a short but carefully drawn-up paper on the history and antiquities of the College, showing that it derived its name from the fact that it was founded as a large "chantry," so to speak, where prayer was for ever to be made for those who had perished in the Civil Wars. Mr. Hurst then led the party over the library, hall, and chapel, pointing out some of the antiquities of each, and dwelling at some length on the "hunting of the mallard." He also pointed out the rooms which were occupied by Mr. Gladstone during his visit to Oxford last winter. From All Souls' College the party proceeded next to the ancient Church of St. Peter's-in-the-East, where they inspected its large and curious Norman crypt, and visited the tomb of the celebrated Oxonian antiquary, Thomas Hearne. Their next halting-place was Magdalen College, where they were met by the President (Dr. Warren), Mr. Macrae (of the Bodleian Library), and the venerable Dr. Bloxham, a Fellow of the College, now eighty-five years of age. He is the surviving brother of the late Mr. Matthew H. Bloxham, of Rugby, and himself the chief



Moor Hall, Gloucestershire.



Moor Hall, Gloucestershire.

repository of the history of his College and his University. Old as he is he was able to accompany them through the hall, the common room, the chapel, the library, and the cloisters; and he explained and commented on the various pictures, books; and he pointed out the tapestry in the State Rooms of the College (formerly occupied by Arthur, Prince of Wales), and enlarged on the beautiful proportions of the College tower. From Magdalen College gates the party drove to St. Bartholomew's Chapel, a sort of grange on the borders of Cowley Marsh, and belonging to Oriel College; but their stay here was short, as they had to drive on to see the very fine Norman Church of Ilfley, a church which is so well known by painting and by photography, that we need not repeat its history or architectural details here. The structure was explained to the party by Mr. Freeman, who kindly acted as their interpreter. After lunch the archæologists inspected the ancient Saxon mound which now forms the chief feature of the Castle, and also the crypt (called St. George's Crypt) which is under the only surviving tower of the Castle, from one of the windows of which Castle it is said that Queen Maude escaped, and, crossing the Thames on the ice, made her way to Wallingford.

Afterwards the party paid a hasty visit to St. Michael's Church, in the Cornmarket, to inspect its ancient tower, which is now generally admitted to be of Saxon date; and they were led by Mr. Walford to the front of Balliol College, where he pointed out to them the cross in the centre of the street which

traditionally marks the spot where Bishops Cranmer, Latimer, and Ridley were so cruelly burnt at the stake. In the evening a meeting was held at the new Examination Rooms, when Mr. Bruton read a paper on the ancient walls of Oxford.

We will conclude our notes of the Congress in our next.

#### OLD COTTAGE ARCHITECTURE IN GLOUCESTERSHIRE.—IV.

THE two sketches illustrated this week are of Moor, or More Hall, near Randwick, close to Stroud. This is one of the best houses in the neighbourhood, though rapidly hastening to ruin for want of slight but necessary repairs. It is now used as two cottages. The shape of the house is unusual, inasmuch as it has not the customary centre and wings. The reason of this is that a new centre block was built over the ground-floor of the hall that belonged to the earlier wing, where the pinnacles still remain. This gives a large central room on the first-floor, which projects out over the ground-floor wall. The front door is brought out to the line of the new building, but the original windows left deeply recessed. Were it not for indisputable evidence, I should have thought from the detail that the older wing to which I have alluded was of later date than the rest of the house, and this is an example of the caution required in pronouncing on date where there is so little definite variety of detail.

At the side of the house is the pigeon-house



shown in both sketches; as will be seen, on one side it is entered by stone steps, while the room below is entered from the lower side. The house stands on a small plateau, on the side of a large hill, in a magnificent situation. There is some good ironwork to some of the doors, of which I may give some notes. R. N.

#### THE ROYAL ACADEMY:

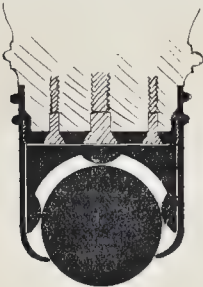
##### ADMISSIONS TO THE ARCHITECTURAL SCHOOL.

The following students have just been admitted to the Architectural School of the Royal Academy, Mr. R. Phené Spiers, Master:—

Upper School.	
W. A. Fenn.	W. J. W. Roome.
W. C. Howgate.	F. E. Smiee.
A. M. Poynter.	
Lower School.	
H. P. Adams.	C. Evans.
W. E. Barry.	D. B. Niven.
J. Begg.	A. Dunbar Smith.
J. Borrowman.	D. C. Veasey.
A. W. Cleaver.	H. H. Wigglesworth.
Probationers.	
H. W. Bird.	G. W. Marshall.
T. G. Charlton.	P. G. Newton.
H. C. Corlette.	G. F. Wilkinson.
E. E. Jordan.	

#### DENT'S PATENT CASTOR.

We have received a specimen of a new form of castor for chair and table legs, &c., invented and patented by Mr. Dent, of Birkenhead, which, though it is open to criticism in principle, appears to act exceedingly well practically, and constitutes an important improvement on the old form of cylindrical castor mounted in a swivel, which so often gives trouble and causes damage to carpets in moving furniture about. Mr. Dent's castor, of which a full size section is subjoined, consists of a polished steel ball loosely seated in a metal holder, and free to turn in every direction; a portion of the ball projects through a circular opening in the holder, and works on the floor surface. The



holder is screwed into a leg of the furniture in the ordinary manner, and forms a roller which has no tendency to turn in any one plane more than another, but adapts itself to every movement of the furniture. Of course the ball is always exercising friction against the bearing-points on which it works within the holder, but as the surfaces of contact here (see section) are reduced to a minimum, and as a rough surface like that of a carpet has much greater "bite" on the smooth surface of the ball, the greater friction overcomes the lesser, and the ball runs freely. On a polished surface, like that of a marble chimney-piece, the ball has a great tendency to bind instead of turning, but on a carpet it works quite well.

The balls, of the finest tool steel, are first roughly turned by hand in the lathe, and then placed in an emery mill (a gross at a time) and ground together in coarse emery for a certain time, passing through three different stages in this way. The last, which of course is the finest, produces a high, hard finish, and entirely destroys all trace of grain of the steel. The cone cup is made of hardened cast steel.

#### COMPETITION.

DULWICH BATHS.—The Commissioners of Public Baths for Camberwell have accepted the report of the assessor in this competition, Mr. Charles Barry, who has recommended the design submitted by Messrs. Spalding & Cross

#### ENGINEERING SOCIETIES.

THE LIVERPOOL ENGINEERING SOCIETY: VISIT TO THE MANCHESTER SHIP CANAL.—On the 9th inst. a party of members of the Liverpool Engineering Society, numbering nearly a hundred, proceeded to Manchester and drove to the site of the Manchester docks, at Pomona, Cornbrook, where they were met by Mr. Leader Williams, the Engineer-in-Chief to the Manchester Ship Canal, who had kindly provided an engine and train of carriages for the convenience of the visitors. The members were at once taken under his charge round the various works connected with the docks now in progress at Manchester. These docks, it may be said, are in a forward condition; the whole of the walls are built up to the water level, and only await the stonework coping to complete them. The party then went up to the site of the Barton swing aqueduct, where the Bridgewater Canal will be carried in a swinging trough, which can be moved so as to allow ships to pass along the Ship Canal, and will be closed to permit of the ordinary canal traffic to be carried on. An examination was made of the lock-gates, in course of construction, which are of a very massive character, formed of immense baulks of greenheart. After showing the party over the works, connected with the first set of locks, gates, &c., Mr. Leader Williams was unfortunately obliged by other engagements to resign the conduct of the party into the hands of his representative engineers, who successively took charge of the train, and described the points of interest along the line of works. A stop was made at the site of the Latchford locks and sluices, near Warrington, which are now in a very forward condition, the whole of the lock floor having been laid, and the walls raised to a considerable height. Several new digging and dredging machines were inspected minutely by the party, more especially a large steam dredger, constructed by Messrs. Fleming & Ferguson, of Glasgow, which was brought in pieces to the site of the works, and there put together. It is now ready for launching into the canal, where it will be used for doing the bottom dredging work. At Widderspool, near Warrington, the members sat down to luncheon, and entertained as guests the resident engineers of the sections of the Ship Canal between Manchester and Runcorn. Mr. H. H. West, president of the Liverpool Engineering Society, in proposing success to the Manchester Ship Canal and the health of its Engineer, remarked that in a company of professional gentlemen there need be no question raised as to the probable or possible effect of the Manchester Ship Canal upon the trade and commerce of Liverpool or Manchester. They were there to admire the stupendous works which had been designed by the energy and ability of Mr. Leader Williams, which were being carried to a successful issue under the direction of the representatives of Mr. T. B. Walker, the contractor, whose untimely death the whole engineering profession must deplore. He concluded by thanking the Engineer and his staff for the courtesy accorded to the Liverpool Engineering Society upon that occasion. After luncheon, the party remounted the carriages, and after an inspection of the heavy works in connexion with the deviation of the London and North-Western Railway near Moore, proceeded to the site of the crossing of the Mersey by the Vyrnwy aqueduct. Here they examined the provision which is being made for carrying the Vyrnwy aqueduct in a brick culvert underneath the bed of the Manchester Ship Canal, and saw also evidences of the work now being pursued by Messrs. Cochran & Co., at the adjacent crossing of the river Mersey itself. Thence the party moved on to Weston Point, where an examination was made of the arrangements connecting the Weaver Navigation with the Manchester Ship Canal, and also the sluices which have recently been fixed at the mouth of the River Weaver, as the initial step in closing up the Weaver estuary by the Ship Canal. The *Liverpool Daily Post*, from whose report these particulars are condensed, says that it is expected that the canal from Weston Point down to Eastham will be opened in January next.

THE INSTITUTION OF ELECTRICAL ENGINEERS opened their annual three days' meeting in the Edinburgh Exhibition on Tuesday, under the presidency of Dr. J. Hopkinson (London). At a conference held in the forenoon, Professor Walsley read a paper on some of the chief features, mainly electrical, of the Exhibition,

and Mr. A. R. Bennet spoke on foreign currents in telegraph and telephone lines.

THE AMERICAN SOCIETY OF CIVIL ENGINEERS has been holding its Annual Convention, Cresson, Pa., being the scene of its deliberations. Papers on skew and other arches of masonry, and on other subjects, were read. The President, Mr. W. P. Shinn, in the course of his address, gave a review of the year's engineering progress in the States, and gave details of several notable iron bridges completed, in progress, or projected. A detailed report of the proceedings appears in the *Engineering and Building Record*, published in New York.

#### ARCHAEOLOGICAL SOCIETIES.

THE SOCIETY OF ANTIQUARIES OF LONDON has just issued to its local correspondents a paper of inquiry as to the following points in reference to their respective localities:—1. Have there been any recent important discoveries of inscriptions, coins, or other antiquities, pro-Roman, Roman, Saxon, or Medieval? 2. Are any archaeological researches or excavations in progress? 3. Can you offer a suggestion for the examination of any barrow or ancient site? 4. Are any remains of antiquity in danger of destruction or injury?

CONGRESS OF ARCHAEOLOGICAL SOCIETIES.—The second annual Congress of Archaeological Societies took place at Burlington House on the 15th inst., in the rooms of the Society of Antiquaries. The report of the Committee on the subject of Parish Registers was presented by the hon. sec., Mr. Ralph Nevill, F.S.A., and was adopted by the meeting. The Committee was reappointed, and a circular containing information and advice as to transcription and publication will shortly be published. It was resolved to take steps to press on Government the desirability of making a slight increase in the allowance made for the inspection of ancient monuments in order to carry on the series of scale models of ancient inscribed stones and other antiquities, of which a most interesting set made by General Pitt-Rivers has been for some time past on view at Burlington House. On the proposal of Mr. Nevill a Standing Committee was appointed, and they were instructed to consider the possibility of preparing and issuing to all societies in union an annual calendar of all the archaeological publications of each year.

ROYAL ARCHAEOLOGICAL INSTITUTE OF GREAT BRITAIN AND IRELAND.—The annual meeting of this Institute is to be held at Gloucester this year, from Tuesday, August 12, to Tuesday, August 19. Sir J. E. Dorman, Bart., M.P., will be the President of the meeting. The President of the Antiquarian Section will be Dr. Edwin Freshfield, F.S.A. The Very Rev. the Dean of Gloucester will preside over the Historical Section. In the Architectural Section the President will be Professor J. H. Middleton, F.S.A., and the Vice-Presidents, Mr. C. J. Ferguson, F.S.A., Mr. J. T. Micklethwaite, F.S.A., and the Rev. Precentor Venables, F.S.A. Excursions will be made by steamboat up the River Severn to Deerhurst Church and Saxon Chapel, and to Tewkesbury. There will also be excursions by road and rail to Sudeley Castle and Spoonley Villa, Prinknash and Painswick, Andoversford, Withington Church, Chedworth Roman Villa, Forsbridge, Northleach Church, Cirencester, Corinium, Museum and Church, and Fairford.

BRISTOL AND GLOUCESTERSHIRE ARCHAEOLOGICAL SOCIETY.—The annual meeting of this Society will be held next week, on the 22nd, 23rd, 24th, and 25th inst. Bristol will be the head-quarters. A good programme has been arranged, including excursions to Wells, Glastonbury, and other places of interest.

KENT ARCHAEOLOGICAL SOCIETY.—The annual meeting of this Society is to be held on Monday and Tuesday next, July 21 and 22, at Canterbury. Some interesting papers are to be read, and on the second day excursions will be made to Chartham, Chilham, Godmersham, Waltham, and Petham.

SURREY ARCHAEOLOGICAL SOCIETY.—The annual excursion of this Society will be to Little Bookham, Great Bookham, Slyfields Manor, and Stoke d'Abernon, on Wednesday next, July 23. Little Bookham Church will be described by Mr. A. J. Style, A.R.I.B.A., and Great Bookham Church by Major Alfred Heales, F.S.A. "Fairfield," now occupied by Mr. Wm. Bousfield, and formerly the residence of Madame D'Arbly (Fanny Burney), will be visited, and here Mr. Bousfield will read a few notes respecting Madame D'Arbly's connexion with Great



Bookham. Slyfields Manor-house, famous for its plaster ceilings and handsome staircase, will be described by Mr. Ralph Nevill, F.S.A., F.R.I.B.A. Stoke d'Abernon Church will be described by Mr. Mill Stephenson, F.S.A., one of the honorary secretaries. The brasses and monuments will be described by Mr. J. G. Waller, F.S.A. By permission of the Rev. F. P. Phillips, M.A., the company will visit the Manor House at Stoke d'Abernon, and inspect the picture-gallery, containing a fine collection of Morland's works. As these places have been visited by the Society on former occasions, it may be of interest to those who intend going on the 23rd to know where to find some particulars of former visits. Great Bookham was visited in July, 1867, when a very interesting paper was read in the church by Major Heales, F.S.A., and which will be found printed and illustrated in Vol. V. of the Society's "Transactions." A descriptive account of Slyfields Manor-house, by the late Mr. Charles Bailey, architect, will be found in Vol. VII. of the Society's "Transactions." The D'Abernon brasses were illustrated and described by the late Rev. Charles Bostell in Vol. I. of the Society's "Transactions." A history of the D'Abernon family by Mr. Charles Spencer Percival, LL.D., will be found in Vol. V. of the Society's "Transactions." Speaking of the brass of the first Sir John D'Abernon, Mr. Mill Stephenson says, "It is the earliest brass in England" [Sir John died in 1277], "and for a long time was thought to be the earliest known, but an earlier one remains at Verden, in Hanover, to the memory of Bishop Woskild, who died in 1281." The slab on the north side contains the effigy of the second Sir John D'Abernon (eldest son and heir of the first Sir John); he died in 1327. That on the south side commemorates Sir William D'Abernon, who died in 1358. Of the oldest brass, that of the first Sir John, Mr. Walter says:—"Considered as a work of art, it will be found that the figure is ill-proportioned, but the arrangements of the drapery judiciously contrived; whilst as a production of the burin, this brass is not excelled by any posterior example. Each link of the mail is distinctly represented, and the mere work of graving-up so large a surface must have cost many weeks of patient labour."

**YORKSHIRE ARCHEOLOGICAL AND TOPOGRAPHICAL ASSOCIATION.**—On the 10th inst. the twenty-fourth annual excursion of the Yorkshire Archeological and Topographical Association was made to Coxwold and Byland Abbey. Coxwold is a beautiful little village among the Hambleton Hills, whose slopes, for a large part covered with woods, and well-known to the railway traveller for the large "White Horse" depicted on them, form a very pleasing panorama. Leaving the station, the members journeyed, some on foot and some in conveyances, to Byland Abbey, a distance of about a mile and a half, where Mr. W. H. St. John Hope, the hon. secretary of the British Archeological Society, described the plan of the ruin, and succeeded in restoring, to the imagination, this ancient home of Cistercian monks. He spoke in strong condemnation of the ivy, on account of the injury it is inflicting on the ruin; but, according to the report in the *Leeds Mercury*, some of his audience expressed their dissent from his remarks. After the old gateway had been visited, the party returned to Coxwold, and proceeded to the church, which Mr. J. T. Micklethwaite, F.S.A., described in a very able and interesting lecture. The church is of the fifteenth century, when it replaced an older one. The chancel was added in the seventeenth century, and contains a curious communion-rail, which formerly surrounded the table, when it was more in the middle of the chancel,—a relic of Puritanism. The table has now been moved under the east window, but the rail remains, so that the communicants kneel in two rows, down the chancel, facing one another. Laurence Sterne was vicar of the parish for several years, and it was here that he wrote "Tristram Shandy." Mr. Leachman gave an interesting sketch of Coxwold, Sterne, and Newburgh Priory, to which place the party then proceeded.

**THE BARRACKS BILL** was read a second time in the House of Lords on the 11th inst., on which occasion Earl Brownlow stated that it was intended to build new barracks at Aldershot, the Curragh, Colchester, Belfast, Manchester, and London. Lord Sandhurst urged that the Director of Contracts should see to it that the very best skill and the best material were employed in the great undertakings which the Government would have on hand.

## Illustrations.

### BEAUVAIS CATHEDRAL.

**SOME** special interest and notice was drawn to this celebrated Cathedral by its being made the object of the principal excursion of the Annual Congress of French Architects two or three weeks ago. On that occasion we gave some notes in regard to the town and Cathedral by a member of the Congress who accompanied the party; and as it is at all events many years since Beauvais was illustrated in our pages, we supplement the French Congress account with a view of the exterior and interior of the Cathedral, reproduced from photographs.

### SHEFFIELD MUNICIPAL BUILDINGS COMPETITION.

We publish the perspective view and plans of the design submitted by Mr. Lindsay, of Glasgow, in the final competition for the Sheffield Municipal buildings.

Mr. Lindsay's design, as will be seen, is very quiet in character, though dignified: it has decided merits of its own as a design, though it is certainly inferior in originality and picturesqueness to several others of the six. We may draw attention, however, to the admirable arrangement of the first-floor plan, which is superior to any other design in this respect. The Council and ante-chamber are admirably placed, the committee-rooms open on a corridor of their own in immediate proximity to a special door of communication with the Council Chamber; the Town Clerk's department is grouped close to these and also close to the public stair; the Town Clerk's private room next to the Mayor's parlour and in a dignified central position facing the main corridor and within easy access to the Council Chamber ante-room. All this is excellent, and no other first-floor plan is so well arranged and so compact.

The author sends us the following notes on his design:—

"Simplicity has been aimed at in the block plan as well as in the lines of corridors, and none of the business rooms obtain light from the two enclosed areas, with exception of the water office, which is top-lighted."

The principal, or Mayor's, entrance is from Pin-stone-street, and the general business entrance is from Surrey-street; additional entrances are provided from Norfolk-street, as well as Cheyne-row, and the basement floor next Cheyne-row can be entered on the level from the large open court."

The Water and Accountants' departments are placed on the lower ground-floor, to the right and left of the Surrey-street entrance, the general office, in each case, having ample public and counter space, and serving as an inquiry-room to the various rooms of the officials, which are grouped in view and in front of the counters. The Accountants' department is all on one floor, but the Water department is continued on the upper ground-floor. The placing of the two principal departments on the lower ground-floor and close to the entrances, would relieve the corridors and staircases of a considerable amount of traffic, which at times will happen in connexion with these departments."

The Council-chamber, together with its suite of six committee-rooms, are so situated that they would all be absolutely free, not only from the disturbing elements, but also from the general business traffic within the building. Access to the Council-chamber can only be had through its ante-room, and also by a doorway from the committee corridor. The sub-committee rooms are centrally placed, and within easy reach of the various departments."

The unusual treatment of the principal stairs has been adopted, so that the Council-chamber should be brought in closer connexion with the Mayor's suite, and the passage connecting the north and south buildings, with its balustrade and 10 ft. of open space on one side, is certainly preferable to the usual 10 ft. or 11 ft. corridor."

The cubic contents, measuring from the datum line 262-0, are 1,843,600 cubic feet."

### WOODEN BOSSES, EAST CLOISTER, LINCOLN.

**THE** reconstruction of the cloisters of Lincoln Minster, rendered necessary by the failure of the foundations, which were of the most imperfect character, recently brought the exquisitely carved bosses of the wooden vaulting to a level with the eye, and afforded an opportunity for their being photographed, of which, as regards those of the eastern walk, adjacent to the Chapter-house, Mr. Hadley, of

Lincoln, has availed himself with excellent skill. Unfortunately the vaulting of the other two walks, those to the south and to the west, were reconstructed and the bosses refixed before the idea of photographing them had been suggested. The fourth of the walks, that to the north, adjacent to the Deanery, fell in ruins at some unrecorded date. That Dean Mackworth (1412-1452) pulled it down to erect his stables is a somewhat exaggerated interpretation of one of the counts brought by the Chapter against him."

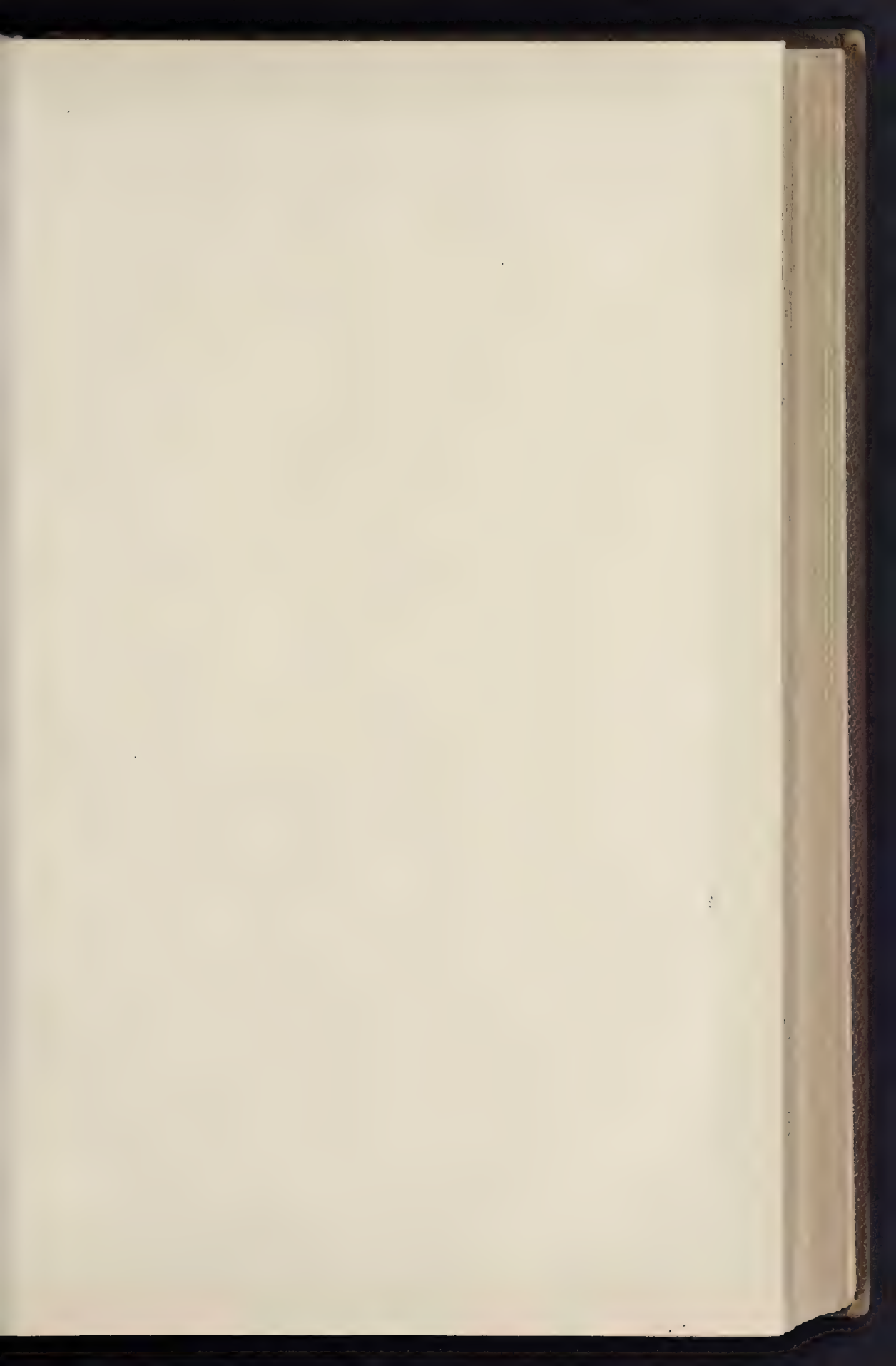
Those that are preserved to us, as will be seen by the accompanying reproduction of Mr. Hadley's photographs, are of singular beauty. The freedom of design and delicacy of execution can hardly be surpassed. The drapery is throughout of exquisite refinement, and the spirit thrown into some of the designs, especially the four representing the months, is very striking. It is much to be lamented that, through the natural progress of decay, the cloisters having been long unglazed, and the woodwork exposed to the damp of some centuries of the mists and drizzle of the Lincolnshire fens, some of the subjects are seriously mutilated. Their imperfection, however, does not hinder them from being accurately identified. The most interesting of the series are the four representing the months of October (?), November, December, January, and perhaps February, by the customary conventional symbols drawn from their several occupations. These are found in the northern half of the vaulting. Religious subjects, Our Lord as an Infant on His Mother's knee, Our Lord in Majesty, the Coronation of the Virgin, &c., appear in the southern half. Two of the smaller bosses are of great singularity, representing in very unusual fashion the "living creature" of Ezekiel's vision. Others of this lesser series are conventional grotesques. The whole series is one deserving of attentive study."

A few words seem desirable as to the date of these bosses. It seldom happens that we can fix the period of any architectural work of the kind within such narrow limits. The Cathedral of Lincoln being from the first a College of Secular Canons, a cloister was no necessary part of the structure, as in conventional foundations. It was a luxury which might be added, if the college was rich enough, in any place, and on any plan which suited their convenience, as at old St. Paul's, Salisbury, Wells, Hereford, Chichester, Exeter, and here at Lincoln, or left out altogether, as at York, Lichfield, Southwell, Ripon, and Beverley. No cloister entered into the original design of Remigius, nor was such an addition, apparently, suggested till the episcopate of Oliver Sutton, at the close of the thirteenth century—1280-1299. We learn from John of Schalby, who was that prelate's registrar, that the erection of the cloister was due to his influence, and that it was started by a gift of fifty marks from his own purse. By July, 1296, the southern wall had been carried up to a considerable height, and though the Dean at the time—Philip of Willoughby—threw obstacles in the way because the northern wall would have to be erected on the wall of his stables,—for which the Bishop told him in courteous language that he ought to be ashamed of himself,—the whole was finished in a short space of time. As was stated at the outset, it was built too hastily to be built securely. There was next to no foundation, and light as the wooden vaulting was, it speedily thrust the walls out of the perpendicular. To remedy this slight buttresses were erected between every set of two bays, and probably at the same time the lower parts of the windows, originally open almost to the ground, were filled up with slabs of stone. The buttresses appear to have been erected after the fall of the northern wall to save the other walls from the same fate, for, on taking them down, they were found to contain fragments of cut and carved stone of the same date and design as the cloister."

The vault of the east walk consists of nine narrow bays of light wooden groining, with a wider bay at the southern extremity, corresponding to the southern walk. A tenth narrow bay at the north end as well as the wider eastern bay have been swallowed up in Wren's Roman Doric cloister, supporting Dean Honywood's library, of the same design as the side arcades of Neville's Court at Trinity College, Cambridge."

\* See Bishop Wordsworth's Edition of the "Laudum" of Bishop Alnwick, p. 86, No. 33, and the bosses are lost.

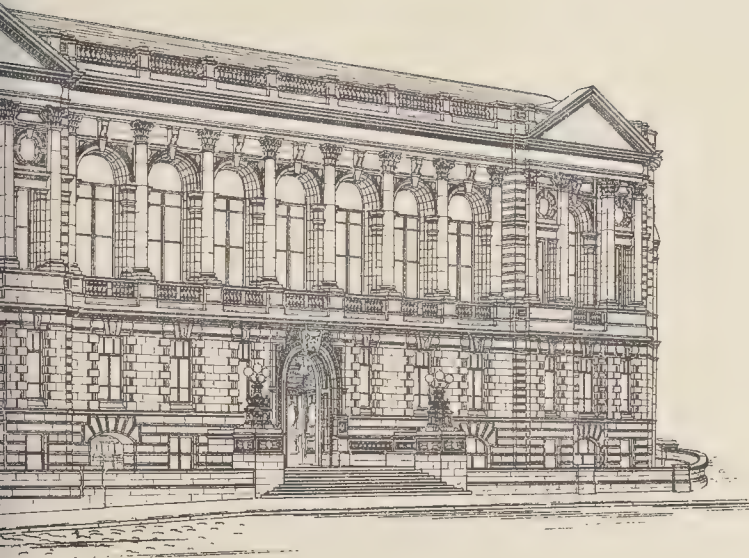






SHEFFIELD MUNICIPAL BUILDINGS FINAL COMP



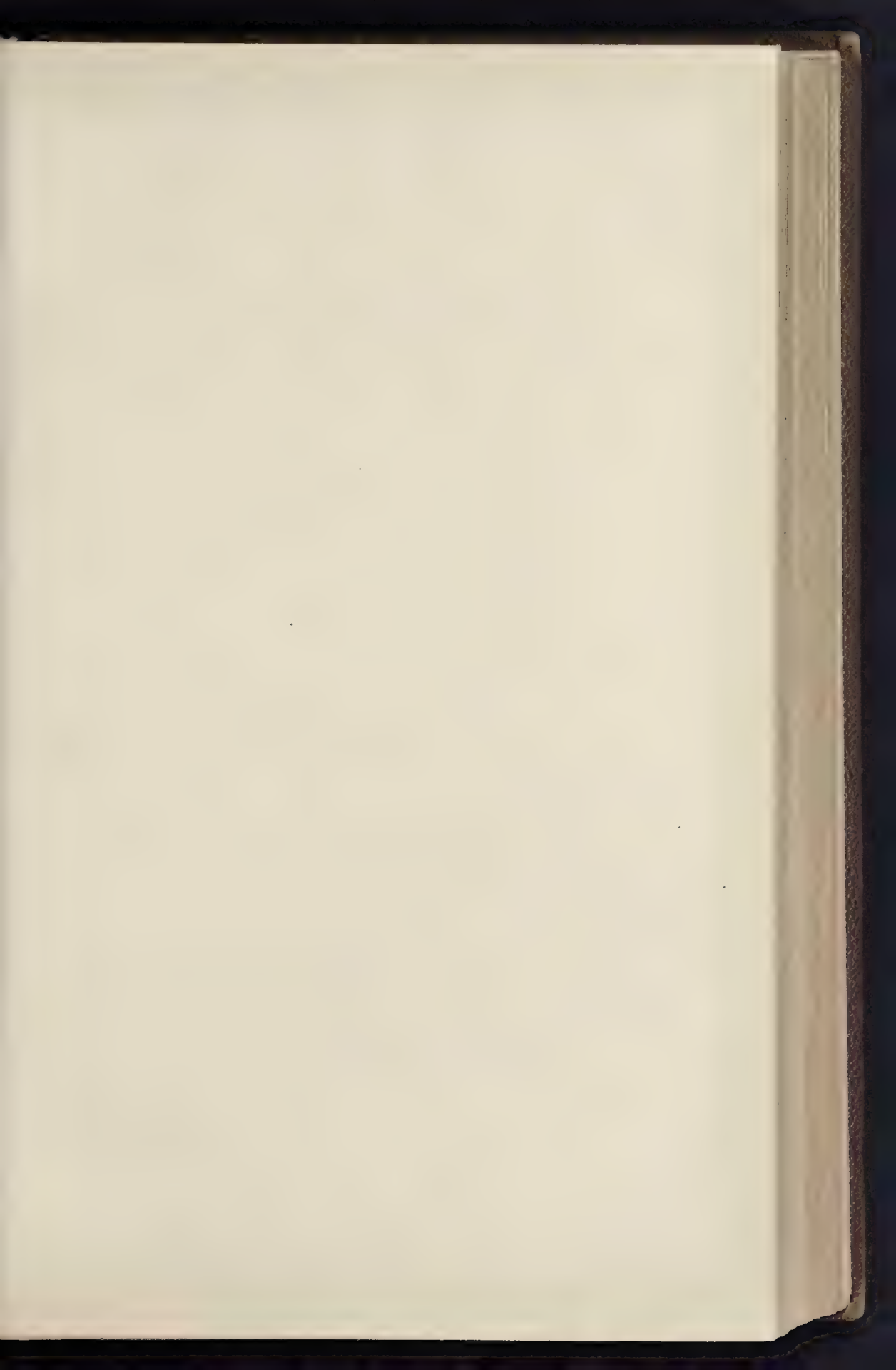


PROF. MR. HENRY E. HILLMAN, LAY, PASTOR, CHURCH

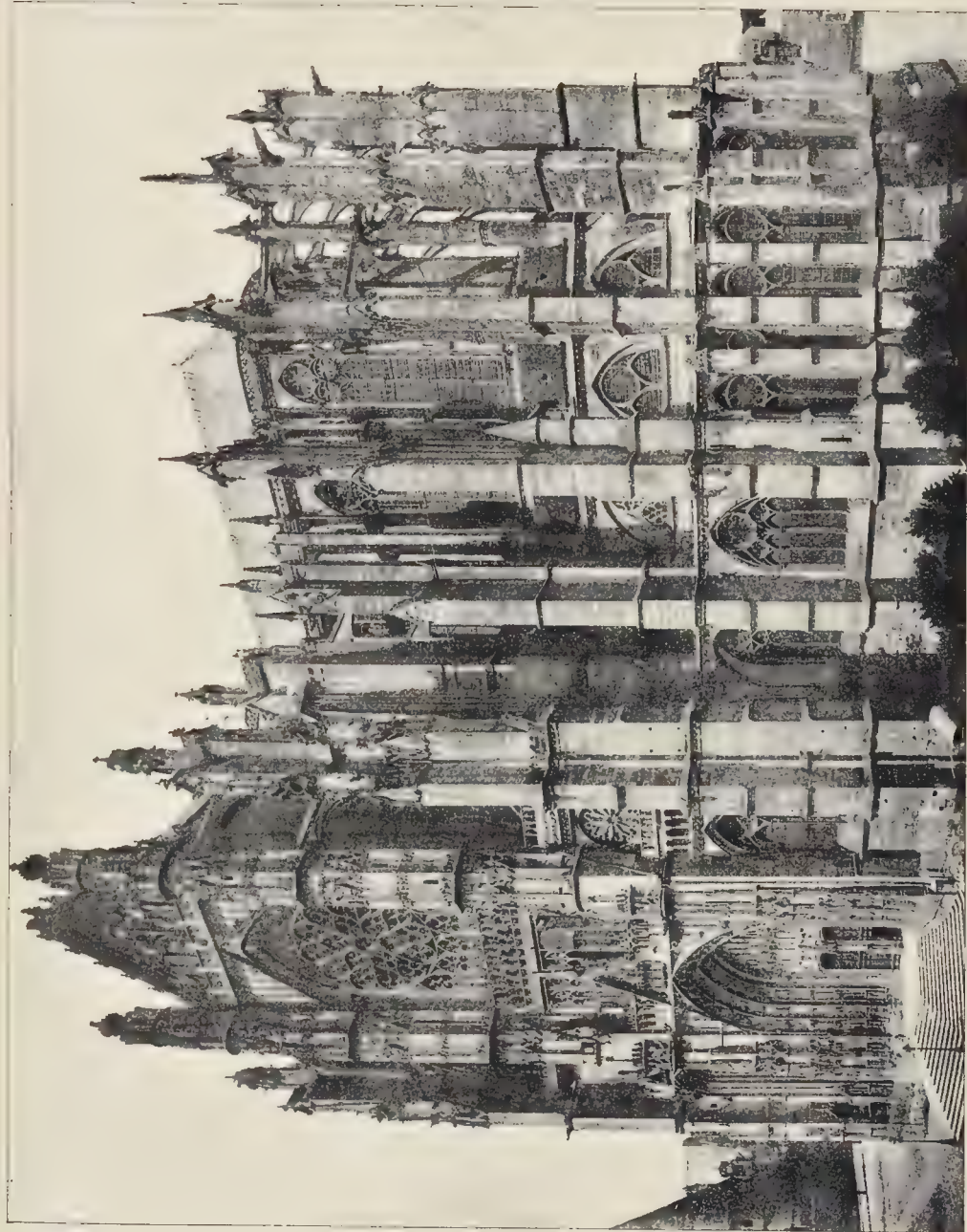
DESIGN SUBMITTED BY MR JAMES LINDSAY A.R.I.B.A.





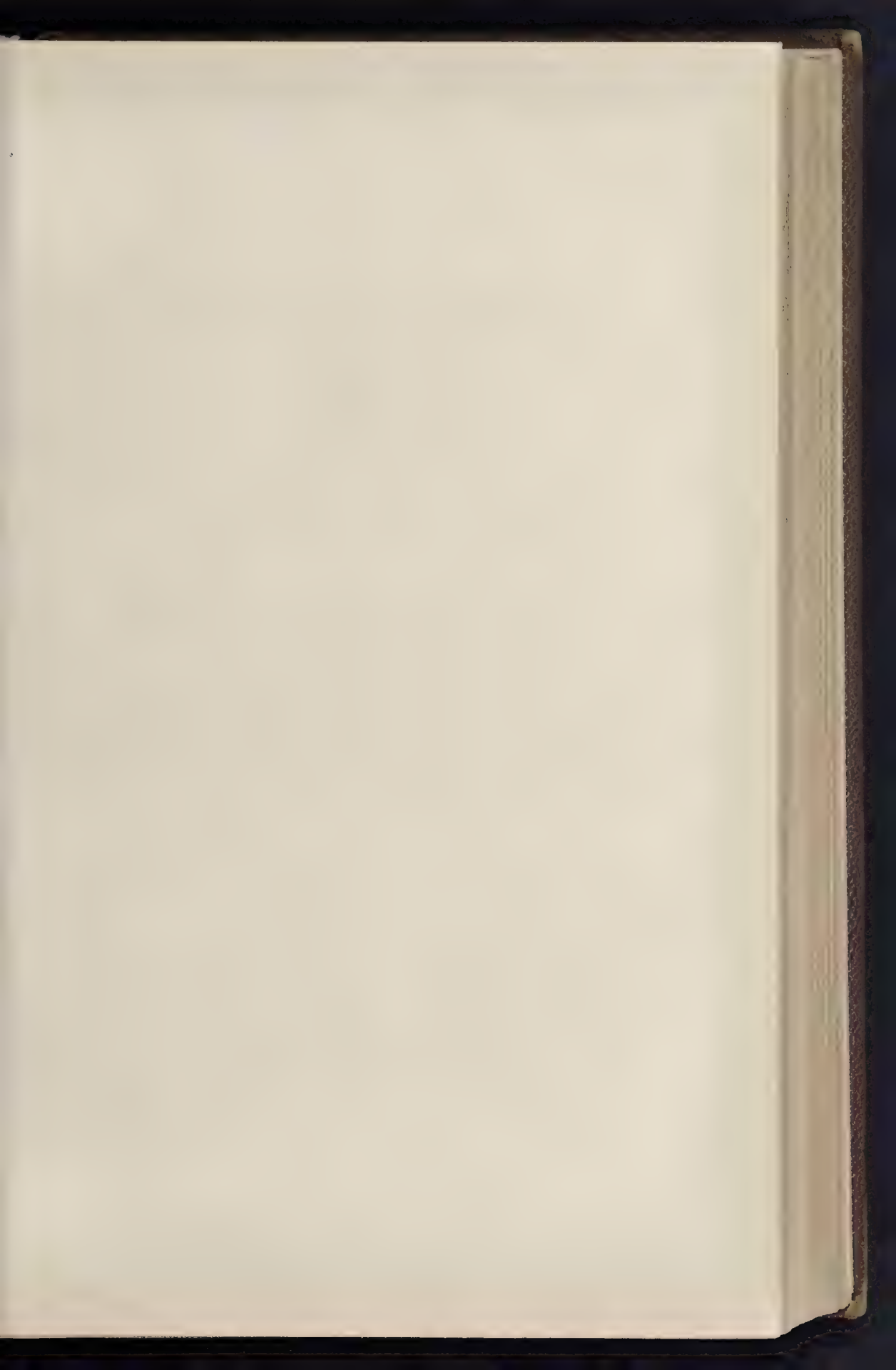


THE BUILDER JULY 19, 1890

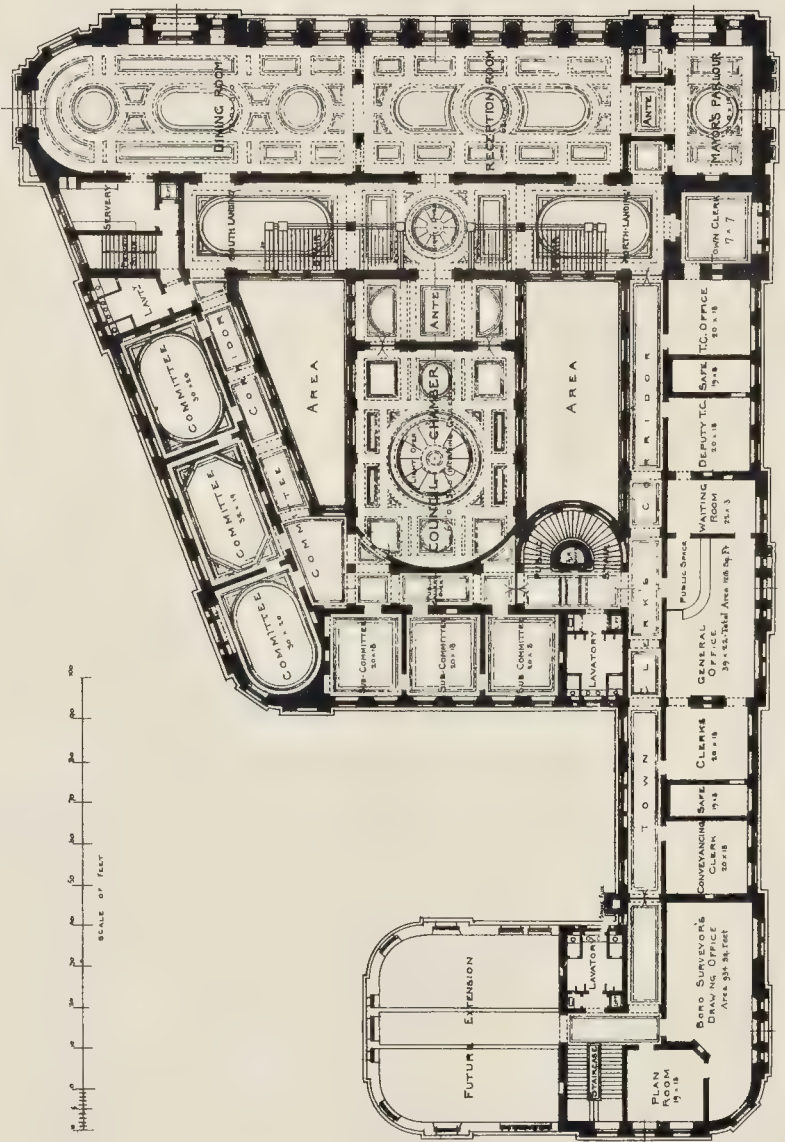


BEAUVAIS CATHEDRAL : EXTERIOR.





THE BUILDER, JULY 19, 1890

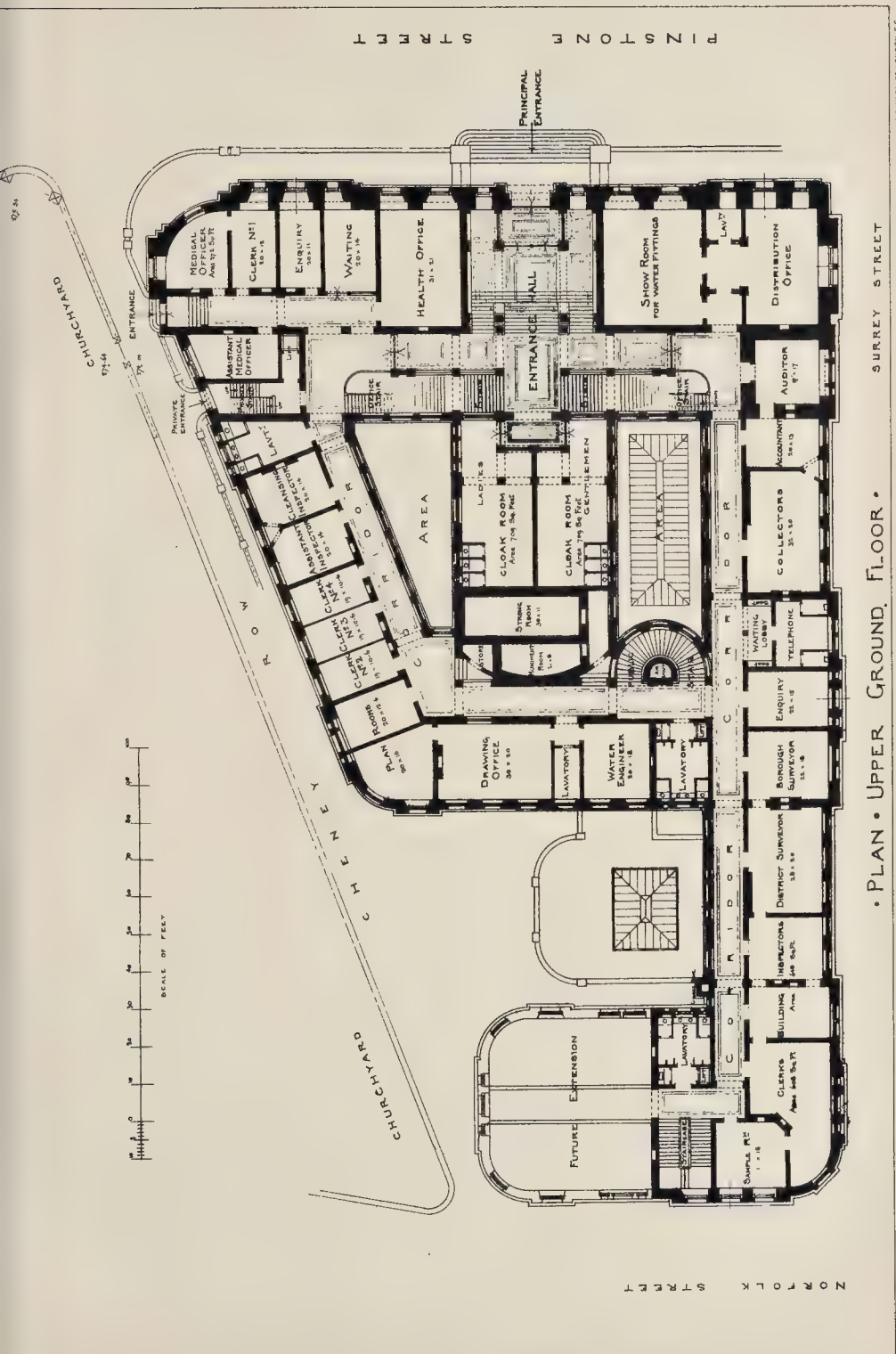


• PLAN • FIRST FLOOR •

PHOTOGRAPH BY SPENCE & CO. 22 MARTIN LANE CANON ST. LONDON E.C.

SHEFFIELD MUNICIPAL BUILDINGS FINAL COMPETITION. DESIGN SUBMITTED BY MR. JAMES LINDSAY. A.R.B.A.







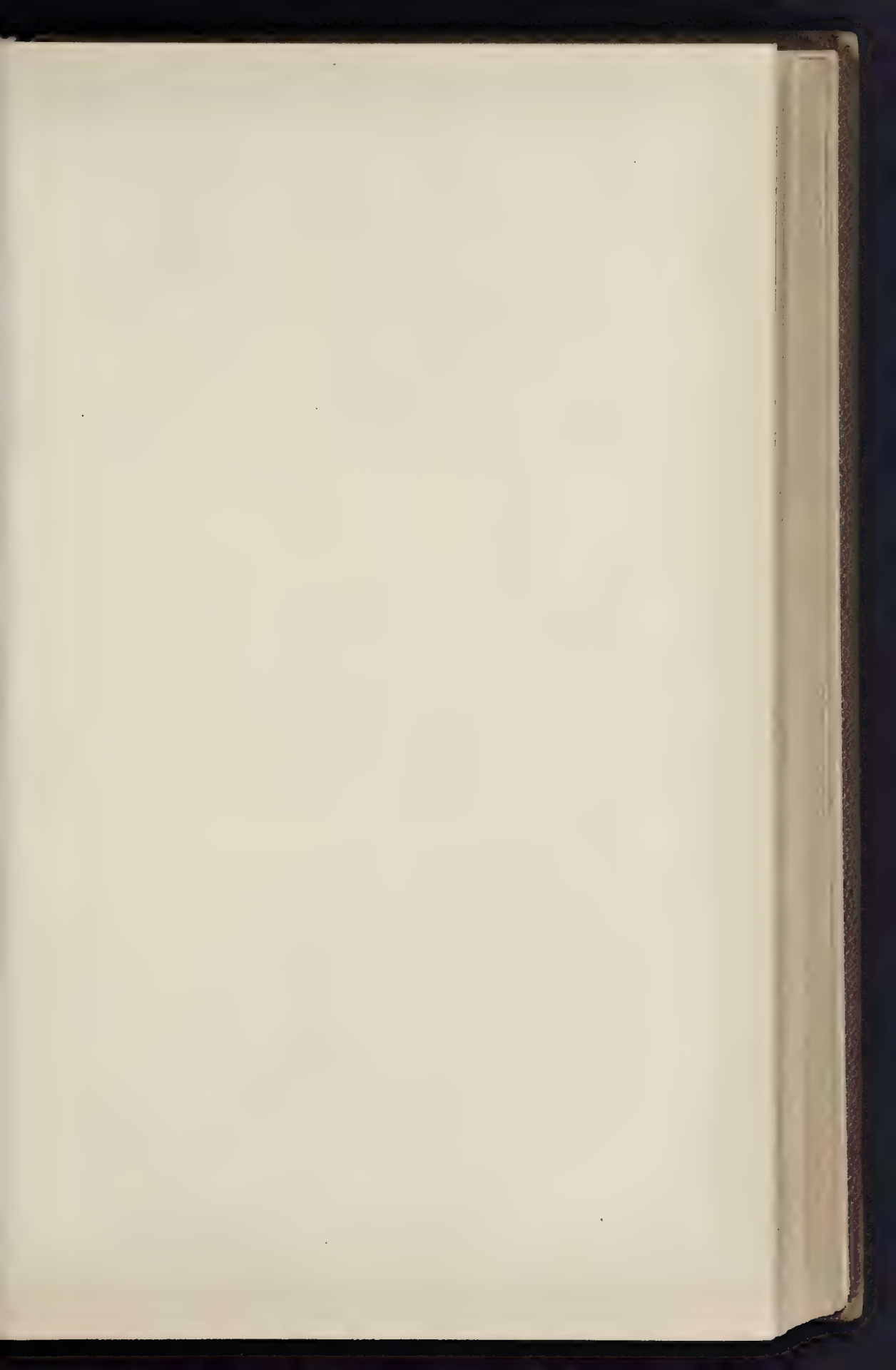




BEAUVAIS CATHEDRAL. INTERIOR









12



15



16



2



8



4



3



14.



10



19.

FROM PHOTOGRAPHS BY MR G. HADLEY, LINCOLN

WOODEN BOSSES: EAST WALK OF

*The numbers represent the order of*





THE PHOTOGRAPH BY E. & J. J. MARTIN, AND THE PHOTOGRAPH BY LONDON E.

CLOISTERS, LINCOLN MINSTER  
(The bosses occur in the building.)





The subjects of the bosses, commencing at the north end, are as follows:—

1. (Much mutilated.) To the right, a man in a long flowing frock, girt round the waist, grasping in his two hands the handle of an axe or some sharp cutting instrument; to the left the stump of a tree on which he is using it. The man has lost his head and legs. Perhaps representing the month of October. The action appears too vigorous for the pruning by which March was commonly symbolised.

2. (Small.) A short, fat man, with long curls depending over his ears, and a close beard, seated with his hands upon his knees, his face indicating a sense of comfort and satisfaction. Possibly representing "cold February," for which a man warming himself at the fire was the usual symbol.

3. November, symbolised by a man sowing corn. He wears a long, loose frock, girt about the waist, and a flat cap, with a muffler protecting his cheeks and chin. On his left side he carries a broad, shallow basket, suspended by a strap passing over his right shoulder, which contains the seeds which he scatters broadcast with his right hand. A sack of corn is behind his right. This figure is very spirited; the action vigorous; the face shows much character.

4. (Small.) Two winged, dragon-like animals fighting; each endeavouring to devour the other.

5. December, symbolised by the killing of a fat hog. The pig-killer is an old man with a long beard, his head covered with a close-fitting coif. He wears a loose frock, with a girdle. His right arm is raised in the act of striking the pig, who is contentedly munching acorns. The axe is gone. The back of the boss represents oak-leaves and acorns, beautifully carved, but out of proportion with the rest of the subject, which is full of vigour. It recalls Tusser's lines—

"When mast is gone,  
Hog falleth anon,"

6. (Small.) A male lamb scratching its nose with its right hind foot.

7. January, the month of good cheer; the prolongation of the Christmas festival. A man clad in a long, loose tunic; ungirt, that he may be more at his ease, with a broad, flat slouching cap, and a hood reaching up over his head and covering his chin, is sitting cross-legged, holding a drinking horn in his left hand, and a bowl in his right, and resting his elbow on a pitcher. Behind him, to his right, is a cask of ale with a spigot. It recalls Chaucer's line:—

"Janus sits by the fyre with double berd,  
And drinketh of his bugle horn the ale."  
"Franklyn's Tale," l. 516.

The happy "abandon" of the subject is very characteristic.

8. (Small.) A very singular group of four small, squat, draped figures, the upper part human, the bodies almost non-existent, the extremities those of the ox, the lion, the eagle, and the man. The heads of three are hooded; the fourth wears a peaked cap. All are gazing upwards. The group is evidently meant to represent the four living creatures of Ezekiel's vision.

9. Two dragon-like creatures, winged, in fierce contest, each biting the other's neck.

10. (Small.) Another subject from Ezekiel's vision, broad for its height, combining the ox and a lion below and the human form above. The being has a female head in a thirteenth-century square headdress, the cheeks and chin covered with a wimple, and long flowing drapery hanging over each ear. The bust is fully vested, the drapery flowing over the breasts. There is no body, but the creature has two sets of extremities, to its right the hooved feet of an ox, and a tail ending in a leaf; to its left the paws and tail of a lion.

11. Our Lord in act of benediction. He is seated on a cushioned throne, the upright supports ending in finials. He is fully vested; the pallium fastened with a diamond-shaped morser; the feet bare. His hair is long and curling; the beard short. The right hand is raised in blessing; the left hand carries the world, represented as a flat disk.

12. (The central boss over the Chapter-house door.) A very solemn-looking rabbit, recalling

\* The photographs, as sent to us, each bore a number, and were arranged for lithography, naturally, in the order of these numbers. Subsequently we learned that these numbers, apparently inserted by the photographer, had no relation to the position of the bosses. It was too late to alter the position of the lithographs, but they are now numbered in the order in which they occur in the building.

"Brer Rabbit," of "Uncle Remus's Tales." His ears are long; his attitude crouching. His head and shoulders are invested with a close-fitting garment, puckered under the chin, with holes for the ears and the eyes.

13. The Virgin and Child throned. An exquisitely graceful composition. The Virgin, veiled and crowned, is seated, and bears the Holy Child on her left knee. The flowing veil passes under his chin from left to right. Her right hand and the head of Our Lord have been destroyed. He holds a dove in his left hand, and raises His right hand in blessing. A dove of a larger size is seated on the back of the throne to the left.

14. (Small, much mutilated; both the head and the hands gone.) A seated angel, exquisitely draped, holding a crown in his left hand.

15. The enthronement of the Blessed Virgin. Our Lord is seated, with long, flowing hair and bearded, in a long tunic, girt round the waist and reaching to the feet which are bare. The right hand raised in blessing, His left holding the world, again in the form of a disk. To His right is seated the Virgin, half turning towards her Son; the head gone. The treatment of this subject is very beautiful, the drapery falling in most graceful folds.

16. (Small, much mutilated.) A grotesque. A tumbler performing his feats holds his right foot on a level with his shoulder. His left hand is on his knee.

17. A large boss of vine-leaves and grapes, exquisitely carved.

18. A calf lying down, scratching its chin with its hind foot.

19. A mitred bishop (Oliver Sutton?) seated on a cushioned throne, his right hand raised in blessing, bearing in his left hand a mutilated crozier.

Of the subjects represented in these bosses, those of the months, and the two from the vision of Ezekiel are the most curious. It would be interesting to know whether examples of a similar treatment of the "four living creatures" occur anywhere else, in carving, stained glass, or in illuminated MSS. The symbols of the months are produced with so much vigour of design and beauty of execution that it is much to be regretted that only four remain. Complete series of these symbolical representations occur in England on the Norman font at Burnham Deepdale, near Hunstanton in Norfolk, described by Dr. Pegge in the *Archæologia*, vol. x., p. 177; on the leaden font, also Norman, at Brookland, Kent, between Rye and Romney, figured and described by the late Mr. Alexander Nesbitt, in the *Archæological Journal*, vol. vi., p. 159; on the Norman doorway of St. Margaret's Church, York, figured in Drake's *Eboracum*, p. 308, and more accurately in 1827 by the late Mr. Browne, of York; in the misericords of Worcester Cathedral, and, though the series is now imperfect, on those of Malvern and Gloucester Cathedrals, and on the lower frieze of the wooden watching-chamber at St. Albans. The most perfect and elaborate series is that on the capitals of the twelve pillars of the choir of Carlisle Cathedral, fully described by Mr. James Fowler, F.S.A., in vol. ii., part ii., pp. 280-296, of the "Transactions of the Cumberland and Westmoreland Antiquarian Society" (1875-6). To the same gentleman we are also indebted for a very learned and exhaustive paper on "The Mediæval Representations of the Months and Seasons," in the *Archæologia*, 1873, which should be consulted by all who desire to pursue this curious and interesting subject. The following verses, from the Sarum Missal, characterising the twelve months, may suitably conclude this paper:—

"Pocula Janus amat; et Februus 'algeo' clamat;  
Martius de vite superflua demit; Aprilis floridæ  
prodit;  
Frons et iles nemorum Mai sicut fomes amorum;  
Dat Junius fens; Julio rescatur avena;  
Augustus epica; September colligit uvas;  
Seminat October; spoliis virgulta November;  
Quærit amare cibum porcum mactando December."

EDMUND VENABLES.

THE NORTH-WEST LONDON POLYTECHNIC AND RECREATION GROUND.—On the 9th inst. the Prince and Princess of Wales visited Paddington with a view to helping forward this scheme, which has for its objects the purchase of a fine open space of 21 acres upon which to erect a large central hall, workshops, class-rooms, swimming-baths, and gymnasium; £50,000, is required for the land, but if £25,000, is at once forthcoming it can be secured. John Aird, M.P., the well-known contractor, is one of the leading promoters of the scheme.

#### THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday afternoon last, the Vice-Chairman, Sir John Lubbock, presiding.

**Resignation of the Chairman.**—The Clerk announced that he had received a letter from Lord Rosebery, dated the 14th inst., resigning his position as Chairman of the Council.

The Vice-Chairman, after reading a brief letter from Lord Rosebery, said they all recognised the ability, courtesy, and wisdom with which Lord Rosebery had presided over their deliberations, and the people of London owed him a deep debt of gratitude. They were glad to know that, though they must lose him as Chairman, they would retain him as a colleague. He was sure it would be the wish of the Council to enter upon the minutes some expression of the regret they must feel in losing their Chairman.

Councillor Beal then moved:—

"That the Council receives with the deepest regret the announcement of Lord Rosebery's resignation of the office of Chairman, and tenders to him its hearty thanks for the devotion with which he has discharged the duties of the office, and for the courtesy and kindness he has uniformly displayed. It desires to place on record its high appreciation of the wisdom and ability he has shown alike in presiding over the meetings of the Council and in rendering advice and guidance to individual members and to the Committees in the discharge of their duties."

Councillor Fardell seconded the motion, which was supported by the Deputy-Chairman (Councillor Haggis) and carried unanimously.

The proper legal formalities having been observed, the office was then declared vacant, and it was resolved to proceed with the election of a new Chairman at the meeting on Tuesday next.

**Vacant District Surveyorships.**—The Standing Committee reported as follows:—

"Now that the Council has settled the conditions under which District Surveyors are in future to be appointed and to act, the Building Act Committee wishes to proceed at once with the appointment of the two Surveyors for the vacant Districts of South St. Marylebone and East Islington. The standing order of reference to that Committee, whilst giving to the Committee the necessary control over the District Surveyors, makes no mention of the method by which those officials are to be appointed. We are of opinion that the most satisfactory method would be for the Building Act Committee to make a selection from among the applicants for the office, and to recommend the person selected for appointment by the Council. In order that the Committee may be duly empowered in the matter, we recommend the following addition to its Standing Order of reference:—

"That the necessary measures for filling any vacancy in the office of District Surveyor be taken by the Building Act Committee, and that the Committee do in each case recommend to the Council the person whom they consider the most suitable for the appointment."

This recommendation was unanimously agreed to.

**The Metropolis Management and Building Acts Amendment Bill.**—The Parliamentary Committee, in a report dated July 10, officially informed the Council that "Sir George Trevelyan's Committee have completed the consideration of the Metropolis Management and Building Acts Amendment Bill, and notwithstanding the difficulties under which the Council laboured in consequence of its inability to expend money in the employment of counsel, and expert and other evidence, the Committee have, subject to certain amendments, passed all the clauses of the Bill, except the eighth, which provided that Vestries and District Boards should not be liable for injury to pipes caused by the use of a steam roller not exceeding 10 tons in weight, where the pipes are laid at a less depth than 24 inches from the surface. This clause was strenuously opposed by the gas companies, and was eventually rejected by the Committee, on whose mind the evidence of Mr. Trefaut, Chief Engineer of the Gas Light and Coke Company, of Mr. Boucher, Chief Inspector of the company, and of Sir J. Bramwell, no doubt made a strong impression. The Bill has since passed through all its stages in the House of Commons, and is waiting introduction into the House of Lords."

**Projected Improvements.**—The Improvements Committee, in compliance with a resolution of the Council passed on December 17 last, submitted a list of such improvements as involve application for Parliamentary powers. They pointed out that the proposals had been selected from north, south, east, and west districts of



the county. The number now brought before the Council did not comprise all which the Committee would have been glad to include in the list had not financial considerations suggested severe economy. While, however, regretting the disappointment to various local bodies resulting from this policy, the Committee ventured to urge upon the Council that street improvement was one of the duties of municipal government, which might not be disregarded without grave injury to the public interests. In the Money Bill of 1888 power was taken to expend the sum of 100,000. In the year 1889, and in the Bill of 1889 power was taken to expend a like sum in the year 1890. Of that amount of 200,000, the sum of 48,105, had been appropriated to improvements agreed to by the Metropolitan Board, and the Council had voted for new improvements only 12,525. The Committee suggest contributions from local authorities in cases where under the system prevailing hitherto such contributions would have been dispensed with. The list of improvements included the widening and improvement of four of the bridges and approaches thereto in the Isle of Dogs, at an aggregate cost of 33,000; the formation of a new street from West India Dock-road to Bridge-road, Poplar, at an estimated cost of 59,800; the widening of Fortess-road, Kentish Town, at the point where that road and Highgate-road enter Kentish Town-road, at an estimated net cost of 28,200; the formation of a new street from Evelyn-street to Creek-road, Deptford, at an estimated net cost of 62,000; the extension of Chelsea Embankment westwards from Battersea Bridge to Lot's-road, at an estimated net cost of 62,000; the widening of Fulham Palace-road and Queen-street at the spot known as "Robin Hood Corner," at an estimated net cost of 8,500; the widening of a part of High-street, Kensington, at an estimated net cost of 47,000; the widening of the Knightsbridge, at St. George's-place, at an estimated cost of 32,067; and the widening of that part of the Albert Embankment, Lambeth, formerly called High-street, Vauxhall, at an estimated cost of 26,600.

The consideration of this important report was postponed for a week, and after the transaction of other business, the Council adjourned.

### Books.

*Treatise on Water Supply, Drainage, and Sanitary Appliances of Residences, &c.* By F. COLYER, M.Inst.C.E. London: E. F. & N. Spon. 1889.

**W**HEN to the above title is added the fact that the book professes to be written as a guide to architects and surveyors in matters of this kind, one would expect to find a bulky treatise instead of a little duodecimo of under ninety pages. The book is in fact merely a collection of general hints on the subjects named, which seem exceedingly good and useful as far as they go, but are more suited to give a general idea on the subject to ordinary readers, than to form a reference book for architects and surveyors, none of whom ought to be content with this amount of knowledge. As a book for the general reader, on the rudiments of house sanitation, however, it may be recommended.

*Elementary Principles of Ornament.* By JAMES WARD. London: Chapman & Hall. 1890.

THE contents of this book were originally a series of class lectures delivered by the author to the students of the Maclesfield School of Art, of which he is Head-master. In general the principles laid down in the book appear to us to be quite sound; the illustrations are rather coarse, but the author states that originally they were merely blackboard diagrams, and pretend to nothing more than that here. They must, however, have been specially drawn for reproduction in the book, and might have been drawn with more feeling for touch and style.

The author is quite right in his advice to students to cultivate the habit of making small but correct drawings of all kinds of plants; nothing refines the eye and hand more; and we agree with him in condemning that school of designers (whose reign, however, is nearly over) who have thought to find new forms by dissecting plants and making decorations out of them, on somewhat the same principle as "preparations" are made for the microscope. But on the other hand we do not think that the

arrangement of naturalistic leaves and fruits so as to fill a symmetrical shaped space (fig. 102) constitutes "ornament"; something more is necessary than that; ornament in the true sense is essentially an artificial thing, a creation by man on the basis of nature; the mere arrangement of purely natural forms in a symmetrical manner requires no thought or invention, and is a very easy way of designing.

The glossary of terms used in ornament is a very useful addition. We must protest against the extraordinary statement on the last page, in which music is compared to ornament, as an arrangement of sounds just as ornament is an arrangement of patterns, which is quite true up to a certain point; but, adds the author, "the imagination, intellect, or deeper feelings are not touched by either!" We fear music is a sealed book to Mr. Ward.

*The Clock Jobber's Handy Book: A Practical Manual on Cleaning, Repairing, and Adjusting; embracing information on the Tools, Materials, Appliances and Processes employed in Clockwork.* By PAUL N. HASLICK. London: Crosby Lockwood & Co. 1889.

THIS is a practical book of directions for repairing clocks, with descriptions and illustrations of the principal tools and the methods of using them. It is of course prefaced by some account of the general history and construction of clock movements, but the usefulness of the book consists in the practical hints from a writer who has acquired a great deal of special knowledge on the subject of tools and the handling of them. Probably an experienced craftsman would gain nothing from it, but it may be a useful help to the beginner.

*"The Great Eastern Railway Company's Tourist Guide to the Continent,"* edited by Percy Lindley (London: 125, Fleet-street), is the eleventh annual issue of a very readable and very nicely printed little handbook, issued in the interests of the enterprising railway company mentioned on the title-page. It gives, in a pleasant, gossip style, a great deal of useful information to the tourist in Belgium, Holland, Germany, and Switzerland, and contains a great many excellently-executed illustrations in the form of picturesque bits of architecture. There is a good deal of new matter in this edition, dealing with some of the less-frequented districts. The book is to be purchased for sixpence, and should be seen by architectural and other tourists who are now thinking-out their plans for the holidays.

*"Walks in the Ardennes,"* edited by Percy Lindley, and illustrated with pen and ink sketches by J. F. Weeden (London: 125, Fleet-street), is a new edition of a bright little handbook, giving particulars of new tours in the Grand Duchy of Luxemburg. At the outset, the editor points out that there are several ways of "walking" in the Ardennes: one is by diligence, another is by steamboat, and a third is by rail, "at a pace suited to the safety of the guard, who swings along the foot-board from carriage to carriage as the train travels, snips your ticket, chats, gesticulates, and even smokes, airily suspended outside by one arm on the rattling-door." Another good way of seeing "this region of forest, rock, and river" is to go on foot, and a final and very pleasant way, practicable in at least one portion of the Ardennes, is to scull. Intending voyagers to this part of the Continent should obtain this excellent handbook, which is published for sixpence, and gives useful information not only as to the antiquities of the district covered by it, but as to boating, fishing, cycling, and shooting.

*"Ye Olde Corner Postes of Ipswich"* is the title of a forthcoming volume by Mr. John Shewell Corder, architect, of Ipswich, who will be known to many of our readers by his "Wayside Notes in East Anglia." The new work will contain a series of twelve large quarto sheets of sketches, illustrating all the old angle-posts at present remaining at Ipswich, and also those removed during the present century. There will be, in addition to the posts themselves, sketches of the old houses of which they form a part, and enlarged details of any striking features. The sketches will be accompanied by full letterpress and descriptive notes, and will form an interesting memento of ancient Ipswich. The edition will be limited to 200 copies, forty of which are already subscribed for. It is hoped the work will be ready the first week in August.—"Architect's Joinery and its Ornament," Part II., by F. A. Fawkes (London: B. T. Batsford, 52, High Holborn), is a useful trade book giving sections and details of plain and enriched mouldings for skirting, dado-rails, picture-rails, mantels, over-mantels, and dado panelling.

—*Lightning Conductors, &c.*—From Messrs. Alfred Hands & Co., of 9, Gracechurch-street, we have received a very useful and interesting illustrated catalogue of lightning conductors, vanes, finials, &c. It is well printed, and contains an historical sketch of the invention and practical application of lightning conductors. So far as we have found, the information it contains is correct, and in accordance with the rules laid down in the "Report of the Lightning-Rod Conference" held in this country a few years ago.

—*Ventilators, &c.*—Messrs. Baird, Thompson, & Co., of 165, Queen Victoria-street, and Glasgow, send us an illustrated catalogue of their improved patent ventilators and other sanitary appliances. As we announced some time ago, this firm purchased the patent rights, &c., of the "Æolus Water-spray" ventilators. The catalogue contains other specialties worth attention.—*Safes, Strong-Rooms, &c.*—Mr. John Tann, of 11, Newgate-street, E.C., has just issued a new illustrated price-list of fire-resisting and burglar-proof safes, locks, and doors for strong-rooms, &c.

### Correspondence.

To the Editor of THE BUILDER.

#### THE LONDON COUNTY COUNCIL AND THE DISTRICT SURVEYORS.

SIR,—The action of the London County Council in adopting the report of the Building Act Committee is another instance of the inability of that body to realise the purpose for which it was created. When will the members understand that they are an executive not a legislative body, that they were instituted to carry out certain Acts, not to ignore them, and that they have only power to do such things and make such regulations as they are specially empowered by Act of Parliament to do?

The proposed alterations in the status of District Surveyors will reduce them from being experienced professional men to mere paid officials, in fact a species of inspector of nuisances; perhaps the next regulation will be that they are to wear uniforms.

The proposal is not only contrary to the spirit of the Metropolitan Building Acts, but totally illegal; it is also a gross blunder, and absolutely impracticable.

The only Acts that deal with District Surveyors are the Metropolitan Building Acts, and the London County Council have only such powers with regard to them that the now defunct Metropolitan Board of Works possessed. All these powers are fully set out in the Metropolitan Building Act, 1855.

By sec. 32, (1) They may alter the limits of any district or unite any two or more districts and place such altered district under the supervision of any existing or future District Surveyor with power from time to time to alter any district so made, and do all such matters and things as are necessary for carrying into effect the power hereby given. (2) They may, subject to certain permission, dismiss or suspend any District Surveyor and appoint a temporary substitute. (3) When a vacancy occurs, they may appoint another properly-qualified person. (4) They may pay such amount of compensation as they think fit to any Surveyor who may be deprived of his office in pursuance of the power hereby given of altering the limits of districts.

By sec. 65 they may cause a fixed salary to be paid to any District Surveyor instead of fees, provided such salary be not less than the average fees for the last three years.

By sec. 67 they may provide wholly or partially for the payment of District Surveyors out of the rates, and may abolish or reduce any fees payable to District Surveyors.

But nowhere in this or any other Act is any power granted them to place any restriction whatever upon any District Surveyor. They have no power to restrain him, as they propose, from practising privately as an architect and surveyor, or to compel him to devote his whole time to the office. No power is granted; it is, therefore, illegal to attempt to usurp such power. On the contrary, by sec. 37, provision is made for the case of a District Surveyor being



architect to a building in his own district; it is, therefore, certainly the intention of the Act that the District Surveyors should be practising architects, although the selection is not confined to those so practising provided the candidate holds the certificate of the Royal Institute of British Architects. As no power is granted, and a negative to that power is inferred, any attempt to place a restriction upon the District Surveyors is a breach of the law, and legal action should at once be taken by those interested to let the L.C.C. understand their true position in the matter. And I defy them to point out any clause that in any way empowers them to place the proposed restrictions on the District Surveyors.

Perhaps the members of the L.C.C. are unaware that some twelve years ago the Metropolitan Board of Works introduced a Bill into Parliament to amend the Building Acts, which was referred to a Committee of the House of Commons, and the question of District Surveyors, their duties and appointment, gone into most thoroughly, when many witnesses of experience, including architects, contractors, and others, were examined; the Committee reported in favour of the existing system, and, as a result, the Bill was thrown out. The M.B.W. had the good sense to apply to Parliament for the power they desired, but the L.C.C. evidently thinks itself independent of Parliament. Query, can the L.C.C. do a thing for which the M.B.W. applied for power, and was refused? I think not.

The only complaint lodged by the L.C.C. against the District Surveyor is the system of "devilling" said to be practised by some surveyors. Provided this charge is correct, the Council have their remedy, for by sec. 36, if at any time it appears to them that, on account of pressure of business in any district, or on any other account, the surveyor of that district cannot discharge his duties promptly and efficiently, then they may direct any other District Surveyor to assist the surveyor of such district in the performance of his duties, or appoint some other person to give such assistance, and such assistant surveyor shall be entitled to receive all fees payable in respect of the services performed by him.

Again, they seek to impose fixed hours on the District Surveyor, as if he were a clerk or schoolboy and not a professional man, who should use his discretion. He is to be compelled to be in his office from 9.30 till 11, and from 4 till 5, so that he only has from 11 till 4 (less lunch time) to do the real work of his office; and if he is specially called upon important business at any other time, say a case of a dangerous structure, he must keep it waiting until he is allowed out. This certainly was not contemplated by the Act. Neither have the L.C.C. any power to compel a District Surveyor to retire at sixty-five years of age.

There are many districts for which the total fees do not exceed 150*l.* per annum. Out of this the District Surveyor will have to provide clerk, office, and other expenses, leaving himself about 50*l.* as handsome pay for the whole of the services of a skilful and upright surveyor. Is the L.C.C. likely thus to obtain a better man than at present? It is true they recommend that the districts be rearranged as opportunities occur, so that the fees are not less than 500*l.* per annum; but when will this opportunity occur? The districts only become vacant one at a time, and many of the least paying districts have the largest area. Suppose one of these districts should become vacant, the vacancy could not be filled by a new District Surveyor compelled to devote his whole time, as no qualified man could afford to undertake the duties for the small fees; if it were divided among the adjoining districts, the new regulation could not come into force, as it is not proposed to affect the existing surveyors, and the duties of those among whom the vacant district was divided would of course be much increased, so that matters would be worse instead of better. Of course, a new surveyor might be appointed at a salary of 500*l.*, but the L.C.C. do not propose to make any alteration in the mode of payment of District Surveyors; how, then, do they propose to get over the difficulty?

The whole affair is utterly impracticable, and, by the proposed alteration, a lower class of men would gradually fill the office of District Surveyor, as no man of experience would give up even a decent practice for the uncertainty held out. The L.C.C. would, therefore, have to select from the young men with slight experience and older men who have proved failures.

It will be observed that although the District Surveyor is to contract not to carry on the "business" of an architect, surveyor, or builder, nothing is said as to his not carrying on other businesses, such, for instance, as that of an undertaker, auctioneer, &c. Will the profession submit to this result?

The alterations are proposed by men who have, with one exception only, at most one year's experience, and that very slight, of the working of the Building Acts, and that one exception, Col. R. W. Edis, opposed the motion.

The L.C.C. went through the farce of consulting the Royal Institute of British Architects, the Institution of Surveyors, the District Surveyors' Association, and the Architectural Association, who one and all advised against the proposed change, with the result that their advice was ignored. If the L.C.C. did not intend to be guided by the unanimous advice, why ask for it?

The curious part of the business is that at the discussion the illegality of the alteration seems to have occurred to none of the Councillors. I sincerely hope that they will reconsider the step they are taking, and not hold themselves up to ridicule by attempting that which they have no power to perform.

July 8, 1890. A LONDON SURVEYOR.

SIR,—Seeing that the Council has passed several resolutions to regulate the appointment of future District Surveyors, one is somewhat curious to learn how it proposes to carry them into effect.

Several of the conditions sought to be imposed by the Council would have to be authorised by an Act of Parliament, as they are *ultra vires* with the Metropolitan Building Act, which defines the duties and emoluments of District Surveyors; but it would appear that the Council do not propose to apply to Parliament for power to vary the terms of the appointments. If this be so, the sooner the Council learn that its functions are to carry out the law as it exists, and not to override it, the better.

London, July 7, 1890. ARCHITECT.

SIR,—It has been decided by the County Council that the District Surveyors elected in the future shall attend at certain fixed times at their offices.

Now, it is difficult to see what good a District Surveyor can do at his office, when he would be better employed on the buildings; but the regulation as it stands prevents his going on the works except between the hours of eleven and four, so that the jerry builders will have from four o'clock each day until eleven o'clock on the next day to do as they like.

We can hardly expect that the same class of men will offer themselves for the future vacancies. The future candidates will be young men, to whom the income will be important, or men between forty and fifty who have not been successful.

A glance through the list of District Surveyors at present holding office will show that men of experience and position have been elected, and it is generally admitted that they have performed their duties to the satisfaction of the public.

OBSERVER.

#### JARRAH TIMBER AS A FIRE-RESISTING MATERIAL.

SIR,—I note in an article of April 5, on "Safety in Theatres and Places of Public Amusement," that you advise the employment of large balks of elm, oak, or Australian iron bark for flooring purposes.

I venture to recommend that a trial should be made of our Western Australian jarrah, as I feel sure it would prove itself to be far superior to any of the above in its fire-resisting qualities, as I can safely say from a long experience, that in large balks it is almost impossible to consume it.

It is without exception, the most disheartening wood to use for firewood that can be found, as, unless you keep the fire stoked up with deal, &c., it will quickly char and die out. An experiment in an open register in good-sized blocks would soon convince any one.

In the jarrah forests the ground is covered everywhere with logs that have lain for years, and although fierce fires pass over them every year, they still defy them, and remain charred on the surface only.

I would like you to try the experiment of testing it as above, and you might then be able to suggest its employment.

FRANCIS BIRD.

Albany, W. Australia, June 2, 1890.

\* \* We are quite of opinion that our correspondent's suggestion is worth attention. Oak has been suggested as a fire-resisting material because it is the hardest and closest-grained English timber. A still harder wood would probably be still more fire-resisting.

#### "ARCHITECTURAL STUDIES IN ITALY."

SIR,—I owe you my best thanks for your appreciative and kindly review of my book, in last week's issue, but my purpose in troubling you is to point out an inadvertent injustice which you have done my companion, Mr. David B. Burnie, architect, in entitling the subjects as measured and drawn by me alone. Although the drawings are my own, the measurements for the two plates you reproduce, and for three of the most important subjects in the book, were taken in Italy by Mr. Burnie and myself unitedly; and it is due to him that the co-operation should be acknowledged, as is done, of course, in the preface to the work.

July 14. WILLIAM J. ANDERSON.  
\* \* We went by the title-page, which gave Mr. Anderson's name only.—ED.

#### LINCOLN'S INN GATEWAY.

SIR,—Most of us will have heard with the greatest satisfaction that our old friend the Gateway is not to be taken from us. May I suggest to the Benchers that they should now apply soft soap and scrubbing-brushes, and remove some of the filth which covers not only the Gateway but the walls of the adjoining courtyard.

This square is really of very pleasing design, though it is somewhat spoiled by the fact that one of the octagon turrets and the library are succeeded. Personally, I should like to see this stucco taken off, and the brickwork again exposed to view, if, as I suppose, it is of red brick to match the rest of the work.

RALPH NEVILL, F.S.A.  
Rolls Chambers, July 15.

#### The Student's Column.

##### HOT-WATER SUPPLY—III.

BOILERS AND INCrustation: continued.

THE subject of incrustation is being dealt with somewhat fully, as it is a question worthy of every consideration in the south of England. It is no exaggeration whatever to say that seven-eighths, or even more, of the fractured wrought-iron boilers in London (and the number is very large), owe their failure to this cause alone. The trouble is greatly aggravated by the fact that very few of the average householders have any knowledge of the subject. The water gives no evidence of having life in its composition, and the Water Companies, who are clearly responsible, and who ought to issue information upon the question, are silent; and the consumer and user of the water gains experience by paying for it when the boiler cracks.

There are probably from eight to ten thousand pounds sterling spent annually in renewing boilers that have failed from this cause, in the London district alone, and the work is necessarily expensive, as in each and every instance a quite new boiler has to be fitted, it being impracticable to patch or repair the injured plate; and to have a new front, the boiler must be made shorter, which, of course, cannot be thought of.

To still further show how prolific of trouble the "fur" is, it might be asked if anyone has ever seen a boiler, in the London district, for hot-water supply that has failed from actual fair usage, that is to say, really worn out; it may be taken for granted that very few, indeed, have ever seen such a thing.

In concluding this subject, it must be explained that the majority of the north of England waters are more or less soft, and differ in character from those of the south in a remarkable degree; the little deposit some of them precipitate is of a muddy nature, which can be flushed out, and it is therefore usual in these districts to provide a pipe expressly for this purpose at the bottom of the boiler. It can be readily understood that different districts must yield waters having a difference in character, but wherever the deposit does not incrust upon the inner surface of the boiler, very little trouble need be anticipated.

After exposing the troubles consequent on the use of hard water it is only fair to point out that it has one advantageous effect upon iron boilers and pipes of considerable importance, viz., that it has a preservative effect and, most important, the water is never discoloured with rust. In districts where soft water prevails the rust question has caused almost more annoyance than the "fur" in hard-water districts.

Soft water has a very vigorous chemical action upon both lead and iron, with the result that with iron boilers and pipes the water becomes discoloured by rust to such an extent



as to be not only an annoyance but a source of serious trouble, and with lead pipes the result is likely to lead to an epidemic of lead poisoning, as it has done many times, and it is on this account that in the soft-water districts copper boilers, cylinders, &c., have to be resorted to, but, of course, at considerable expense. But one beneficial effect of hard water is that lime is a violent opponent to rust,\* and the thinnest film of carbonate of lime entirely overcomes this trouble, and it is on this account that copper, so largely used in the North, is quite the exception in the South for hot-water purposes.

This peculiarity that lime possesses in opposing the formation of rust can be taken advantage of by coating any form of boiler or iron vessel with lime-white when the vessels in question are inclined to give trouble by discolouring the water with rust, a very common occurrence with the ordinary open-top side boilers of kitchen ranges the first month or two they are used; and more than one cure has been effected to an iron-pipe apparatus, when rusting from the action of soft-water, by running through a strong solution of lime-white through it and so coating the interior of all the pipes, &c., with lime. This coating must be allowed to get thoroughly dry before charging the apparatus with water.

#### BOILERS.

Boilers for hot-water supply, usually called bath or high-pressure boilers, may be divided into two distinct classes, viz., those that are fixed in and heated by the fire of a kitchen-range, and those that are independent.

Neither of these boilers can be made in any great variety of shapes, like those for heating purposes, on account of the "fur" deposit question and all its drawbacks having to be considered. The advantages and disadvantages of some of the shapes commonly seen in kitchen ranges can be profitably discussed, but it will be found that nearly every range-maker, especially if he be a specialist, has a boiler of his own particular pattern, and for which he naturally claims superiority.

There is one object sought by all makers alike, and that is to obtain the largest possible effective heating surface, and so provide a more abundant or rapid supply of hot water than others; but this cannot be carried to any great extent, as, in the first place, the boiler is most usually made to the range, not the range to the boiler, and, secondly, the interior of the boiler must be tolerably roomy and clear for cleaning purposes,—no tube flues can be permitted, for instance.

If it were not for the trouble that fur occasions, the most efficient and economical form of boiler (1) known could be used, viz., a coil of pipe, which, if properly fitted, is all heating surface (ordinary range boilers have a little more than half their surface untouched by the fire); but with London water a coil fixed in this manner becomes furred up and split in eight or nine months, but even with this objection they are sometimes used, their



FIG 5

cost not being great, provided their removal and renewal in an expeditious manner can be arranged for.

\* A most interesting experiment was made at the Royal Institution some time ago with a view to determine whether the presence of carbonic acid in air or water was responsible for the rapid oxidation or rusting of that is experienced when iron is exposed to either of these elements in the ordinary way. Two test-tubes were taken and filled with ordinary water, and into each was placed a common sewing-needle; one tube was sealed up in this state, and the other tube was sealed after having a small piece of quick-lime (oxide of calcium) placed in it. These tubes were placed away for twelve months, and at the expiration of this time examination showed that the needle in the tube of ordinary water was a mass of rust, whereas the needle in the tube of water with lime in it was perfectly free from rust, bright, and equal to new, owing to the lime having taken up the carbonic acid (present in the water) to form carbonate of calcium. This clearly illustrates that hard water has one redeeming feature in connexion with hot-water boilers and apparatus.

The most ordinary form of boiler is of a square shape, with a sloping front, and having an arched flue, as at fig. 5. This is the shape that is almost invariably met with in the cheap makes of ranges,—those used by the speculative builder, who considers lowness in cost of primary importance. It is not intended to convey that all boilers of this shape are necessarily attached to cheap ranges, but that is the shape invariably used in cheap goods of this sort.

This is about the least powerful form of boiler made, as they rarely exceed 10 in. in length from front to back, and whatever the object is in making the front sloping it has a most prejudicial effect in decreasing the size of the fire at the bottom, with the result that the accumulation of ash more quickly chokes the boiler flue, and the less the body of fire the less bright it burns with less evolution of heat, in fact it must have been originally intended to have this front projection at the top instead of at the bottom of the boiler, for this arrangement would certainly be more effective. Any one may perceive that a heating surface overhanging a fire gives better results than one projecting beneath.

This pattern, which is very frequently (mis) called a saddle boiler, can have its efficiency or heating power increased by adding to its length from front to back, or by adding to its width, so as to give a greater area to the bottom heating surface, but both length and width, particularly the latter, are governed by the construction of the range fire-box.

#### SURVEYORSHIPS.

THE LEATHERSELLERS' COMPANY.—We are informed that out of 150 candidates who made application for the appointment of Surveyor to the Leather-sellers' Company, Mr. Samuel Hill, of the firm of F. W. Porter & Hill, Russell-square, was ultimately chosen for the appointment from seven names specially selected at a previous Court meeting.

BIRMINGHAM.—The Public Works Committee of the Birmingham Corporation, in a report presented to the City Council at its meeting on Tuesday last, state that Mr. Buckley, the Road Surveyor, lately informed the Committee that he was about to apply for the office of Surveyor of Roads to a neighbouring County Council, at a considerably advanced salary, and asked for a testimonial. The Committee, being impressed with the desirability of retaining Mr. Buckley's services, requested him to withdraw his candidature, and undertook to recommend the Council to increase his salary from 400l. to 500l. per annum. To this Mr. Buckley consented, and having regard to the large and increasing amount of work in the road department, to the responsibility of the office, to the economies effected by Mr. Buckley, and to the efficient and conscientious manner in which he discharges his duties, the Committee unanimously recommended that his salary be increased to 500l. per annum from July 1. This was agreed to by a large majority.

#### OBITUARY.

MR. JOHN CLAYTON, for many years Town Clerk of Newcastle-on-Tyne, died on Tuesday last, in his ninety-ninth year. Born in 1792, he succeeded his father in 1824 in the office of Town Clerk. The *Newcastle Chronicle* says of him that he "took part in the counsels at the beginning of the industrial epoch which found George Stephenson and his locomotive at its threshold," and "was at the planning of the Newcastle and Widdow's Ferry Railway." He was well known as an antiquary, especially in connexion with the excavations he carried on for more than thirty years on the site of the Roman wall, at Housesteads, the Chesters, and Chollerford. Some of the remains discovered were visited by the Archaeological Institute in 1852, and Mr. Clayton's researches in connexion with these remains have been made better known by Dr. Collingwood Bruce's book on the Roman Wall.

MR. JOHN PAGE, Chief Engineer of the Canadian Government Railways and Canals, died suddenly at Ottawa, Ont., on the 2nd inst. He was seventy-four years old. He went from Scotland to the United States in 1838, and worked in the construction of the Erie Canal, after which he went to Canada. He directed the construction of the St. Lawrence Canal system, and prepared the plans for the canal now being built at Sault Ste. Marie, Ont.

THE ARMOURERS' AND BRASIERS' COMPANY.—Mr. J. Franklin-Adams, the Master of this Company, writes to say that, encouraged by the success of the Exhibition held in May last, and noticed in our columns at the time, the Armourers' and Brasiers' Company propose holding a second Exhibition upon similar lines in May, 1891.

#### GENERAL BUILDING NEWS.

PETERBOROUGH CATHEDRAL.—The Archbishop of York has consented to preach at the reopening of Peterborough Cathedral in October. The work of restoration is far from complete, and the fittings of the Benedictine choir have yet to be provided. Canon Agles has given the pulpit and throne, and fourteen stalls have been promised, and are being executed from the designs of Mr. Pearson, R.A.

A NEW SEMINARY IN SURREY.—A few days ago the R.C. Bishop of Southwark laid the memorial-stone of a new college, to be erected at Lostford, near Wonerah. The architect is Mr. Walters, of London, and the estimated cost is about 23,000l. It is intended to provide accommodation for about 100 students. The work has been entrusted to Messrs. Longley & Co., of Crawley, Sussex. There is a piece of ground immediately adjoining the college, where it is contemplated to erect a chapel. This will not be commenced until the completion of the larger work, and the estimated cost of it is between 2,000l. and 15,000l. The clerk of the works is Mr. J. S. Hoskins.

ALL SAINTS' CHURCH, LLANILWCHAIRN.—This new church, situate near Newtown, Montgomeryshire, was consecrated on the 26th ult. It has been erected at the sole cost of Sir Pryce Pryce-Jones, and consists of chancel, nave, and south aisle, and the possibility of a north aisle being required at a future time has been duly taken into account. There is also an organ-chamber, and there are vestries for the clergy and the choir. In the nave and aisle is accommodation for about 450 worshippers, and in the chancel provision is made for a choir of 30. The style is simple Pointed, and the effect has been sought in good proportion and careful detail rather than in ornamental accessories. The stone of the wall is from the quarries at Llanymynech, with Grinshill dressings, and the roof is covered with green Bangor slates. The external wood-work is entirely of oak, and the roof timbers are left as they came from the tool and unvarnished. The south-east corner of a tower, with octagonal spire, rises to the height of 75 ft. The building is heated throughout on Haden's hot-air system. The font and pulpit, which are of Grinshill stone, were specially designed, and they were executed by Mr. Roberts, of Walspool. The altar hangings were supplied by Messrs. Halbrunner & Co., of London, the brass lectern, the credence table, the altar chairs, and the chairs and kneelers for the nave and aisle were supplied by Messrs. Jones & Willis. The site belonged to the Llanolchydol estate, and was the gift of Mrs. Lovell. The builders were Messrs. Davies & Son, of Newtown. The Clerk of Works during the earlier portion of the time was Mr. Williams, who was succeeded by Mr. Latta. The architect is Mr. Aston Webb, of London. The entire cost has exceeded £3,800.

PROPOSED IMPROVEMENTS AT BLACKPOOL.—Extensive damage was done to the "lower walk" of Clarendon Park by the severe storms of last winter. The walk is close upon three quarters of a mile in length, and the hulking which protected it from the sea was entirely washed away during the mid-winter months. The consequence is that the walk has been considerably encroached upon by the action of the waves, and it is necessary that steps be taken to prevent the further encroachment of the sea, and also for the protection of the terraces of houses on the upper cliff, which (according to the *Liverpool Daily Post*) may be threatened. The Blackpool Town Council, in conjunction with the Land and Building Company, who own the greater portion of the park, have been considering the matter for some time, and they have just arrived at a decision. The Council recommend to the Land Company and the ratepayers of Blackpool generally, that an application be made in the next session of Parliament for powers to spend a sum estimated at between 70,000l. and 80,000l. in carrying out an extensive scheme of improvement which will involve the entire reconstruction of the park and its approaches.

THE CARMELITE PRIORY CHURCH AT SOUTH QUEENSFERRY.—The *Scottian* reports that the ancient Carmelite Priory at South Queensferry was reopened on the 10th inst. for the conduct of worship, having been restored for that purpose after having been in disuse for fully two centuries and a half. Recently the members of the Episcopal Church Mission, which has been maintained for some years at South Queensferry, on the outlook for a suitable place in which to worship, approached Captain Dundas, the owner of the building, for liberty to use the Priory. Captain Dundas, after consideration, offered the church in perpetuity on condition of its being restored, an offer which was accepted by the Dean and Chapter of St. Mary's Cathedral, Edinburgh. The work of putting the building into good order was not a very serious undertaking, as the chancel, transept, and towers were almost intact, and the massive walls were exceedingly substantial. Under the supervision of Messrs. Seymour & Kinross, architects, Edinburgh, the work of repair was carried out about six months ago. The roof of the chancel was renewed, and a temporary roof was placed on the tower. A new roof was placed on the transept, and all the windows were repaired.



**SCHOOLS, WATFORD.**—New schools for the Watford School Board are about to be erected from the designs of Mr. C. P. Ayres, architect, Watford, which were selected in a limited competition.

**MR. MAY'S OFFICE, HAVESHAM-LANE, NEAR TOLLENTON.**—The contract for this work has been let to Messrs. Thompson & Brierley, builders and contractors, of Bury, their estimate being 3,100*l*. The architects for the work are Messrs. Maxwell & Tuke, of Manchester.

**PRESBYTERIAN SCHOOLS, BOLTON.**—The contract for Bowker-street Presbyterian Schools, Bolton, has been let to Mr. Wm. Townsend, builder and contractor, of Bolton, his estimate being 1,000*l*. The architects for the work are Messrs. Maxwell & Tuke, of Manchester.

**PROPOSED EXTENSION OF THE WIGAN PUBLIC LIBRARY.**—On the 9th inst. Colonel W. M. Duguid held an inquiry relative to the Wigan Public Library, an extension having been made for borrowing power to enable the Corporation to extend the library.

**BRUNSWICK CHAPEL, LEEK,** has been reopened after alterations and re-decoration. Messrs. J. & J. Mathews were the contractors for the woodwork and other builders' work. Mr. G. T. Stevenson for the heating apparatus, and the works have been carried out to the satisfaction of the architects, Messrs. W. Sugden & Son. The *Leek Times* says that the building was built by the father of the Messrs. Mathews to the plans of Mr. Sugden, sen., thirty-five years since.

**BARADON CADOXTON GAS AND WATERWORKS OFFICES.**—The *Western Mail* (Cardiff) understands that the tender of Messrs. John Aird & Sons, London, has been accepted for the erection of extensive new offices, officials' residence, &c., for the Barry and Cadoxton Gas and Water Company, on a site to the westward of the gasworks at Barry Dock. The work, which will be commenced at once, is expected to be completed before Christmas. New high and low level reservoirs are likewise being erected at Penycroft and Merthyr Doyan, under the superintendence of Mr. J. A. B. Williams, C.E., Cardiff, the consulting engineer. The contractors in these instances are also Messrs. Aird & Sons, and the high level reservoir will be completed in the course of a month. Improvements at the gasworks are being carried out under the direction of the permanent engineer, Mr. F. H. Harris.

**NEW BUILDINGS AT LITTLEHAMPTON.**—According to the *Sussex Daily News*, the building prospects of Littlehampton are improving. At the last Local Board meeting considerable time was occupied in inspecting plans for business premises and private houses.

**FREE PUBLIC LIBRARY, BARNSELY.**—A free public library and reading-room for Barnsley, the premises for the accommodation of which have been munificently presented to the town by Mr. Charles Harvey, was opened last week by the Mayor of Ripon. Under the direction of Mr. J. H. Taylor, the Borough Surveyor, the rooms on the ground-floor have been fitted up as a reading-room, newsroom, general and reference libraries, and so forth. The tables, chairs, and other fittings are in walnut, and were supplied by Messrs. Johnson & Appleby, of Sheffield. On the next floor there is besides the reading-room a hall capable of accommodating 2,500 people. On the ground-floor is a range of offices, and the rooms over them are occupied by the Barnsley School of Art.

**GLYN CHURCH, RISA.**—It has been decided to rebuild the Glyn Church, Risa, Mon. Plans are being prepared by Alfred Swash, architect, Newport.

**NEW BANK AT LEEDS.**—A new branch bank is to be built for the Birmingham and Midland Banking Co. in Kirkgate, Leeds, from the designs of Mr. William Bakewell, architect, Leeds.

**HOUGHTON-LE-SPRING SEWERAGE SCHEMES.**—A Local Government Board inquiry by Colonel J. O. Bastedo, R.E., one of the Board's engineering inspectors, has been held at Houghton-le-Spring regarding an application by the Houghton-le-Spring Urban Rural Sanitary Authority for sanction to a loan for two schemes of main sewerage and sewage disposal. The engineer (Mr. D. Ralfour, M. Inst. C.E.) explained that the first scheme, related to the townships of Hetton-le-Hole, Moorley, and East Houghton, comprising eleven miles of pipe sewers and twenty-one acres of land for sewage disposal by the system of intermittent land filtration, the total estimated cost, inclusive of land purchase, being 18,875*l*. The second scheme related to the townships of Newbottle, West Houghton, and Peshaw, and comprised nine miles of pipe sewers, twenty-two acres of land, laid out on the above system, and the total estimated cost, inclusive of land purchase, was 13,875*l*. There being no objections made to the schemes, the inquiry was closed after the inspector expressed his satisfaction of the plans and documents submitted to him.

**GOOLE DRAINAGE.**—At the meeting of the Goole Local Board on the 9th inst. the contract for the construction of drainage in Old Goole by Messrs. Jackson Bros. was signed.

**JUSTA-MURAL INTERMENT.**—It is a striking proof that the simplest elements of sanitary knowledge are unknown, that events disregarded, by those who desire to lead in public matters, that another proposal has been made to make a new cemetery close to London. No sooner has a scheme to establish one at Mitcham failed, than a still more objectionable site is seriously offered for the purpose at Wandsworth, close to the Middlesex County Asylum. Few spots more unfavourably situated for such a purpose than this, through its proximity to flowing streams and active drainage, or more pressed upon by an increasing population, could have been suggested. With the rapidly-increasing demands of the metropolis and its growing suburbs for space and air, for careful avoidance of all collections of decaying matter as foci of disease, the erection of a cemetery within twenty-five miles of Charing-cross, at all events on the South side, must now be regarded as little less than a crime. —*British Medical Journal*.

**NORTH-EASTERN SANITARY INSPECTION ASSOCIATION.**—On the 10th inst. the annual meeting of the North-Eastern Sanitary Inspection Association was held in Newcastle. Ald. W. D. Stephens presiding. The annual report showed that during the past year the membership had increased from 470 to 600, the receipts from 1,337*l*. to 2,005*l*, and the balance from 675*l*. to 1,122*l*. The Chairman, in the course of his remarks, said the report spoke for itself. The society now occupied the second position among the sanitary inspection societies of the kingdom. The report was adopted.

**BUXTON SEWERAGE.**—On the 15th inst., Mr. Arnold Taylor held an inquiry at the Town Hall, Buxton, respecting the application of the Local Board to borrow 1,060*l*. for sewerage works. Mr. Hague, C.E., Town Surveyor, stated that the district was increasing. The recent population was 7,500, and in the future 10,000 to 15,000.

**ALVASTON AND BOULTON SEWERAGE.**—At a special meeting of the Alvaston Local Board, held on the 11th inst., it was decided to instruct Mr. W. H. Radford, C.E., Nottingham, to prepare a scheme for the sewerage of the district. The district to be drained includes a rapidly-increasing suburb of Leeds.

**THE NATIONAL REGISTRATION OF QUALIFIED PLUMBERS.**—As will be seen by an advertisement in our columns this week, a public meeting in support of this movement will be held at the Town Hall, Kensington, on Wednesday next, the 23rd inst., under the auspices of the Worshipful Company of Plumbers.

#### SANITARY AND ENGINEERING NEWS.

**SANITARY CONGRESS AT BRIGHTON.**—We have received the preliminary programme of the Twelfth Congress of the Sanitary Institute, which is to be held at Brighton from August 25th to the 30th. The President of the Congress will be Sir Thomas Crawford, K.C.B., M.D. Section I. of the Congress, "Sanitary Science and Preventive Medicine," will be presided over by Dr. G. V. Poore. Section II., "Engineering and Architecture," will have for its President, Professor Roger Smith, F.R.I.B.A. The President of Section III., "Chemistry, Meteorology, and Geology," will be Mr. William Topley, F.R.S. In connexion with the Congress, there will be a Conference of Medical Officers of Health, presided over by Dr. Arthur Newsholme, and a Conference of Inspectors of Nuisances. There will also be a Health Exhibition, to be held in the Corn Exchange Pavilion Buildings, and a Museum (which adjoins each other) from August 25 to September 13.

**THE THIRLMERE WATER SCHEME.**—The *Manchester Courier* reports that the longest tunnel in connexion with the Manchester Waterworks scheme, the Raise Tunnel, which extends from near Townhead Green to the straining wall in Thirlmere, and is 5,225 yards long, was completed, so far as boring is concerned, on the night of the 9th inst. The tunnel has been in progress nearly four years.

**SOUTHARK.** 2. Working Men's Club, Vauxhall. 3. A large mission-hall in the poorest part of Woolwich. In this case help can be obtained in stencilling from workmen in the Arsenal. 4. The Neighbourhood Guild, a boys' and girls' club in Kentish Town. All these rooms will be used for meetings and social gatherings.

**ST. MARK'S CHURCH, WORSLEY.**—The *Birmingham Gazette* says that it has been decided by the parishioners of St. Mark's, Worsley, to erect a stained-glass window in St. Mark's Church in remembrance of the labours of the Rev. the Marquess of Normandy during the eighteen years he was vicar of the parish, prior to his lordship's departure to San Remo, Italy. The rev. marquess entered up his duties as chaplain of All Saints' Church, San Remo, in November.

#### FOREIGN AND COLONIAL.

**FRANCE.**—The Rouen Museum has come into possession of a very curious facade in carved wood, which formed part of the Abbey house of the Dames de Saint Amand. It dates from the fifteenth century.—At Spinal, in the Vosges district, a competition has been opened for a new lycée, which is to cost nearly two million francs.

A competition has been opened for designs for a building for departmental archives at Melun (Seine-et-Marne).—M. Boeswillard, Inspecteur Général des Monuments Historiques, has been commissioned by the Ministry of Fine Arts to restore the house where Joan of Arc was born, at Domrémy, to its primitive aspect. The Government proposes to collect in this house the principal works in painting and sculpture which French artists have produced in illustration of Joan of Arc's history.—Paris is not the only city to have a monument to Berlioz. A statue to him, by M. Urbain Basset, is shortly to be erected at Côte Saint André (Isère), his native place.—The monument to Admiral Courbet, the joint work of M. M. Falguère and Morel, is to be inaugurated at Amiens on August 17.—We learn from the *Semaine des Constructeurs* that the competition for designs for a covered market at Provins (Seine-et-Marne) has resulted in the first premium being awarded to M. Léon Majoux, architect, of Paris; the second to M. A. Cœquelin, "architecte-expert," and M. Barre, "ingenieur constructeur," both of Paris; the third to M. Théophile Bourgeois "architecte-verificateur," of Poissy.

**HAMBURG.**—The great bricklayers' strike, which has been of more than nine weeks duration, has come to an end, the men having resumed their work under the former condition of affairs.

**HEIDELBERG.**—We hear that a Committee of Architects and other competent judges is to be elected for the purpose of coming to a conclusion as to the advisability of restoring those parts of the famous old Schloss that are of special architectural merit, and which are at present in a semi-ruinous, although certainly very picturesque state.

**LIEGE.**—The Belgian architectural, *L'Émulation*, gives a favourable account of an architectural exhibition now being held at Liege, with a considerable number of small reproductions from the drawings exhibited, which include decorative work as well as architecture among the exhibits mentioned with praise are the designs for villas and châteaux in the Renaissance style, by M. Gustave Charlier; the church at Hanefelle and the restoration of the Chateau Montgiscard by M. E. Jamar, an hotel at Liege by M. Chas. Soubre, &c.

**LYON.**—The celebration of the completion of the Cathedral spire went off with all due pomp and ceremony on the last Sunday of June. Among the entertainments were included a historical pageant (with over 1,700 figures), an excellently acted play which had been written for the occasion, a very fine organ recital on the Sunday morning, an illumination of the spire on the night before. The nation of the spire on the night before. The nation of the spire on the night before. The nation of the spire on the night before. Professor A. Beyer, was naturally a conspicuous figure on the occasion, and received several orders from different Sovereigns, and an honorary degree from one of the Universities.

**THE "WORLD'S FAIR" AT CHICAGO, 1892.**—This is the name which has been given to the proposed Exhibition at Chicago in 1892. The negotiations which have been going on for some time between the Illinois Central Railroad Company and the World's Fair Directors and the South Park and City officials have reached a culmination. The proposal made by the representatives of the company except the railroad is that the railroad company shall give up all its claims to the lake front, which it has been prosecuting in court; shall help fill in the space required in the basin for the purpose of the fair, and shall pay to the City 1,500,000 dollars. In return for this the railroad is to be given the 300 ft. right of way near the outer edge of the new-made park, which is to be covered over so that the tracks will not be seen. In addition to the ground made for park purposes, the railroad will fill in enough land along its right of way, as far south as Twenty-second-street, so that a boulevard can be made along the lake shore, connecting by way of South Park Avenue with Drexel and Grand Boulevards.



THE ANNUAL "ART EXHIBITION" of Munich, which is considered to be far superior to the official "Academy" one of Berlin, has been opened by the Prince Regent of Bavaria, attended by a very distinguished suite. The catalogue shows that 1,426 oil paintings have been hung, that the water-colour division shows 135 names, sculpture 182, and architecture 25. The "genre" subjects furnish the greatest contingent, and the foreign men France, the Netherlands, and Scotland occupy the chief space.

#### MISCELLANEOUS.

THE NEW BRIDGE AT BATTERSEA is to be opened on Monday next, at 3 p.m.

THE PROPOSED AMALGAMATION OF SCOTCH RAILWAYS.—The Select Committee of the House of Lords appointed to inquire into the merits of the Bill for amalgamating the Glasgow and South-Western Railway with the North British Railway decided on the 11th inst., at the close of the case for the promoters, that the preamble of the Bill had not been proved. This Bill, which had been sanctioned by the House of Commons, is therefore thrown out.

THE DIRECTORS OF THE NATIONAL GALLERY have just lost an opportunity of supplying a notable omission in their collection. It is absolutely without a single specimen of the great modern French School, whose fame has been established by Delacroix, Millet, Delacroix, Fromentin, Troyon, Diaz, and Meissonier. There was some expectation that the collection formed by the late Mr. John Siltzer of South Kensington, which contained fine specimens of these artists, would be purchased for the nation. They have, however, been bought by a French firm, and will forthwith be removed to Paris.—*Daily News*.

A NEW WHITE LEAD PROCESS.—The evils attending the manufacture of white lead by the Dutch or stack process are too well-known to require insisting on, and were pointed out many years ago. They may be summed up as—expensiveness, tediousness, and serious danger to health. Attempts have been made from time to time to introduce other methods of manufacture, but these, for the most part, have proved failures. Another process for attaining the desired and inexpensively, quickly, and safely has just been brought before the public. This process is the invention of Professor MacIvor, F.R.C., and has been in operation for the past nine months at the experimental works, Clapham-road. In this process of manufacture, the litharge is, according to the *Times*, first made from lead ore and then thoroughly purified by washing. It is then put in a vat which is fitted with stirring apparatus, and a solution of acetate of ammonia is run into the vat upon the litharge. The mixture is then agitated for six hours, so that the lead is fully absorbed into the solution, and it is allowed to settle. The supernatant liquor containing the lead is then pumped over into a second vat, in which it is submitted to the action of carbonic acid gas. By this means the lead is precipitated and the acetate of ammonia recovered for use over again. If the litharge is very pure, the carbonic acid gas is introduced into the first vat, with the result that the white lead is produced direct and the acetate of ammonia separated at the same time for re-use as before. In either case, after the white lead has been precipitated, the mother liquor is drawn off and the unwashed white lead is passed through filter presses to extract from it all the mother liquor. The pressed lead is then put in a washer and agitated by stirrers in cold water. After eight of these agitated washings, the white lead is again passed through the filter presses and through a hydraulic press, from whence it is removed to the drying-room, and, when dry, is ready for use. The result is a pure white lead, free from crystals, and produced in a few hours, as against months by the ordinary method, the cost of production being also much less. The process and the products have been examined by several leading chemists, who include Professors Crookes and Watson Smith, and Dr. Dupré. All the operations in the manufacture of lead under this process are done in the wet, so that there is no dust, and therefore no danger to health from that source.

CHAPEL-EN-LE-FRITH CHURCH.—The *Sheffield Independent* says that it would appear that an entirely unlooked-for obstacle has presented itself in connexion with the proposed "Grimthorpe" of Chapel-en-le-Frith Church:—"It is now contended, following upon the matter:—'It is now contended, with apparently much reason, that the sum of £2,000, left by the late Mr. Samuel Needham upon trust 'towards repairing, renewing, or restoring the fabric of the Parish Church,' cannot be used for the purpose of demolishing the church. The Vicar has publicly said of the old part of the church, 'Nothing heaven will ever induce me to alter my determination to pull the chance down; down it shall come at all costs, down it shall come!' Is the Vicar, then, going to carry out his miserable policy of destruction of his own pocket? This objection counsel's opinion is now being taken. Can the Vicar do as he likes with regard to the church without the sanction of the Ecclesiastical Commissioners?"

YORK CASTLE WALLS.—For some time past (according to the local papers) a proposition has been under consideration by the Estates Committee of the York Corporation to take down a portion of the Castle wall, in order to open out to view the ancient and historic Clifford's Tower. The Town Clerk, on behalf of the York Corporation, recently sent a communication to the Yorkshire County Committee, intimating that they would consider favourably the following proposals:—That the Corporation remove the wall extending from the end of Clifford-street to Skeldergate-bridge, and dispose of the stone thereof as they saw advisable; that the County Committee give up a strip of ground to be agreed upon hereafter, for the purpose of widening Tower-street; that the York Corporation erect a dwarf wall with fences, railing, and gateways, for enclosing the County Committee's property; and that the public have free access to the open space between the railings and Clifford's Tower. This scheme, however, was opposed by a large number of memorialists, who were of opinion that the suggested improvement would be of very doubtful advantage. The Castle walls were unique in the kingdom, and formed a national landmark of which any city might be proud to be the custodian. The County Committee, at a meeting just held, agreed with the views of the memorialists, and declined to accede to the propositions of the York Corporation.

PROPOSED MEMORIAL TO "THE SALFORD HERO."—A public meeting was held at the Salford Town Hall last week with a view to a movement being inaugurated for placing a memorial statue over the grave of the late Mark Addy, a working man who had gained the appellation of "the Salford Hero," having during his life saved over fifty persons from drowning. A committee was formed with this object. An appeal was put out by Alderman Bailey, Addy's bravery was shown not merely by jumping into water to rescue others, but into the water of the "inky Irwell."

PROPERTIES FOR SALE.—(1) Pishiobury, Hertfordshire, a sporting property of 530 acres in all, bounded by the river Stort, lying near to Sawbridgeworth. It is commonly stated that the house was built for Sir Walter Midway by Inglo Jones; and in the "Dictionary of Architecture" (vol. iv., *sub nom.*) it is included, upon Walpole's authority, amongst Jones's probable works. Yet the house would seem to have been of a rather earlier date, having been sold by Sir Walter's son, Queen Elizabeth, about of the county in 1590-1, for whom the house was built. (2) Rampton Manor, about 1,700 acres, embracing nearly the whole of Rampton parish, in Nottinghamshire. This estate includes twelve farms situated in the Trent Valley, the whole yielding a rental of nearly 3,000*l.* a year. Rampton has for long been a seat of the Eyre family. In the parish church is a monument to Gervase Eyre, who was killed at the defence of Newark Castle in the civil wars. (3) Tanworth, in the southern portion of Warwickshire, consisting of 1,900 acres, under high cultivation, belonging to Earl Amherst. The estate will be divided into twenty-eight lots, to meet the views of purchasers. The parish church is St. Mary Magdalen, rebuilt during last century, and restored ten years ago; was originally a chapel of Brailles, that had been assigned to the canons at Kenilworth by Roger de Newburgh, Earl of Warwick. Tanworth belonged until the end of last century, when it passed to William, Lord Amherst, at one time Governor-General of India, by his marriage, in 1800, with the daughter and co-heir of Andrew, second and last baron Archer. (4) Boxley, about 612 acres, near to Maidstone, including the ruins of a Cistercian abbey. The fine church here was repaired about twenty-five years since; and (5) at Ightham, in that county, an interesting house, known as the "Town House," standing in the village, and which is believed to have been built in the fifteenth century.

NEW SURFACE FOR PLASTER CASTS.—The attempt to cover plaster casts with a galvanic coating of a permanent character has hitherto failed owing to the difficulty of stopping the pores of the surface so effectually as to prevent the galvanic bath penetrating into the interior of the plaster and there producing first crystallisation and then disintegration. The difficulty seems now to have been overcome by Messrs. Greif & Steinach, of Munich, who have discovered that saturation in tar not only closes up the pores of the plaster but adds very considerably to its strength. Specimens so prepared have been covered with copper one millimetre thick, a thickness which is not only sufficient to resist atmospheric influence, but permits of the surface being further worked up and finished by hand. The price of a casting coated with copper is said to be one-fifth of the cost of a copper casting. In small pieces so thick a coating would considerably affect the proportions; this has to be met by making the necessary reduction in the plaster.

TECHNICAL EDUCATION ASSOCIATION.—The annual meeting of this Association was held on the 10th inst. at their office in Dean's-yard, Westminster. The report for the year stated that the committee were glad to record a substantial advance in public opinion, and a real beginning of the long-neglected work of expanding, improving, and organising the technical and secondary education of the country. They regarded the action that had been taken under the provisions of the Welsh Intermediate Education Act as distinctly encouraging. Mr. Dixon associated the instruction of factory boys in whatever branch of art or industry they might be engaged. It was an erroneous supposition that the trade unions would raise any objections to this plan; on the contrary, they were very strongly in favour of such teaching.

THE ENGLISH IRON TRADE.—There is no great change in the English iron market, but it has been fairly steady during the week. The demand for pig-iron has been somewhat livelier, but it has not been above the average. Prices of crude metal are generally maintained. The tendency of Scotch pig-iron warrants has been upwards, but makers' iron is rather weaker. The price of Cleveland pig is much the same as last week. Pig-iron is stronger in the midlands, but scarcely so in Lancashire. Hematite pig is quiet. There is more business in finished iron, and greater firmness prevails. Low prices still rule for steel, but the inquiry is on the whole better. The position of shipbuilders is not improving. Engineers are still relatively active.

THE SOCIETY OF CHEMICAL INDUSTRY.—The proceedings in connexion with the annual meetings of the Society of Chemical Industry commenced at Nottingham on the 9th inst. in the large lecture theatre of the Nottingham University College, the chair being occupied by the President, Sir I. Lowthian Bell. The annual report of the Council stated that the membership of the Society had increased from 2,445 to 2,595, and that there was a balance in the bank of 1,720*l.* The President delivered his inaugural address, the subject of which was "The Chemical Industry of the Future, as it is being considered." Mr. E. Rider Cook, of London, was elected President for next year, and Birmingham was selected as the place of meeting.

THE BISHOP PARRY MEMORIAL.—The second meeting of the executive committee for providing a memorial of the late Bishop-Suffragan of Dover was held on the 9th inst. at Lambeth Palace. Mr. James Forsyth, sculptor, attended the committee, and exhibited a clay model of a recumbent figure, and various plans for a base. Suggestions were made by the Archbishop of Canterbury and others as to slight alterations in the figure and to the subjects to be represented on the base. The latter were all unanimously agreed to. The complete model is to be approved later, on a day to be fixed, at the sculptor's studio. The effigy is to be placed in the nave of Canterbury Cathedral, and to the west of the recumbent figure of Archbishop Sumner. The cost of the monument will be 1,000*l.*

IMPROVEMENT IN VENETIAN BLIND FITTINGS.—We have had an opportunity of seeing in action Andrew Smith's patent Venetian blind fittings, manufactured by Messrs. Smith, Collier, & Co., of Aldersbury. The new fittings dispense with the ordinary iron pins, and are so arranged that they can be fixed for receiving the blind, the latter being instantaneously removable at will, thus doing away with the inconvenience attending those at present in use. Smith's patent fittings can be adapted to all existing blinds at a nominal outlay, and their use will save much annoyance and vexation.

THE LAFEBAT MEMORIAL AT SOUTH SHIELDS.—The hfeboat memorial at South Shields, which was unveiled on the occasion of the opening of the new marine parks, as mentioned in our columns a fortnight ago (p. 179 *ante*), consists of a fountain, which was constructed by Mr. J. B. Farbridge, monumental mason, of South Shields, from the drawings and under the superintendence of Mr. J. H. Morton, F.R.I.B.A., of the same town. The parks, as already stated, were laid out from designs by Mr. Matthew Hall, the Borough Engineer.

THE INVENTOR OF ERASIVE RUBBER.—The question as to who was the inventor of the pencil eraser is one that has caused considerable interest from time to time, and it is only lately that some one in France, who was poring over the history of the Academy of Sciences in Paris for the year 1752, came upon the following passage which explains the matter:—"The Frenchman who made use of pencils from lead mines to draw architectural fortifications, and to erase the crumb of bread to rub out the marks of the pencil. M. Magalhães, or, as we spell it, Magellan, member of the Academy, a worthy descendant of the great navigator who discovered the strait south of Patagonia which now has his name, proposed a more effectual and convenient method of erasing, and of a piece of rubber which can always be used about. Rubbing by this new method is found to more satisfactorily remove the marks of the pencil and all other spots that are on the paper."—*New York Times*.

THE "QUEEN'S PROMENADE," DOUGLAS, L.M.—This new promenade, which has been constructed by the Douglas Commissioners, replaces old property formerly backing on to the shore, and is nearly 600 yards in length, with wide roadway and footpath separated by grass lawns. It has cost over 5,000*l.*







## COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITION.

Nature of Work.	By whom Advertised.	Premium.	Designs to be delivered.
* Higher Grade School	Swales (U.D.) Sch. Bd.	15 and 10 Guineas	No date

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
* Erection of Public Office	Wilton Local Bd.	E. H. H. H. H.	July 22
Brick Gasholder Tank	Thipton (Staffs.) L. B.	Vincent Hughes	do
Warehouse and Ship, Trans.	Edwin, Burton, Eng.	Silvanus Trevell	do
Residence, Blyde	Jas. Jenkins, Eng.	T. C. Nicholson	do
Additions to College	Harlesham College	T. F. Shaw	do
Rowley Key Stone (100 tons)	Aston Manor Loc. Bd.	W. Augustus Durn	do
Vagrants Ward, Rye, Sussex	Guardians	Lamb & Armstrong	July 23
Bridge Girders and Iron Flooring	Valencey & Lee, Bd.	J. W. Jones	do
Newspaper and Purification Works, Bathgate	Police Commissioners	J. S. & Leslie & Sons	July 24
Forty to Fifty Houses, near Cardiff	Orchard & Pugh	Thos. Boderick	do
Brick, Granite and Granite Gravel	Canterbury U.S.A.	Official	do
House, Stables, &c.	Leeds Industrial Co-operative Soc. Ltd.	W. & J. B. Bailey	do
Hospital, at Calverley, Leeds	St. Lukes Ven. Midea.	Official	do
Thirteen Houses, Leeds	J. McAlister, Esq.	Official	do
* Painting, Cleaning and Hoisting	Walsall Corporation	George Sutherland	July 25
Three Elms, Polling Newington, Essex	Walsall Corporation	Official	do
Seawall and Road Works	Walsall Corporation	Official	do
Additions to School, Portgordon, Banff	Rev. D. Coghlan	J. K. Freeman	July 26
Sheltering Cottages, St. Church, Ballynure	Rev. D. Coghlan	Official	do
Teachers Residence, Ballynure	Rev. D. Coghlan	Official	do
Road Works	Berry and Cadogan	J. C. Pinder	do
Thirty-one Cottages, Tylorstown, near Footscray	Directors' Com. Prison	Thos. R. Phillips	do
* Building Materials	Directors' Com. Prison	Official	do
Erection of Public Bath, at Bescap	Directors' Com. Prison	C. L. N. Wilson	do
Work and Playrooms at Orphanage, Glasgow, Dublin	Directors' Com. Prison	Official	do
* Vagrants Ward at Workhouse	Ward Department	John L. Robinson	do
* Painting, &c. at Devonport	Ward Department	Official	July 28
Villa Residence, Glasgow, Wigan	Ward Department	Official	do
Laundry and Washhouse, Cleveland	Ward Department	Official	do
Playhouse, Walling, and Fencing	Ward Department	Official	do
* New Road and Sewer	Ward Department	Official	do
Barrow, Inverness, &c.	Ward Department	Official	do

Those marked with an Asterisk (\*) are advertised in this Number.

## CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
* Wood Paving	Wandsworth B. of Wks.	Official	July 29
New School	Walthamstow Sch. Bd.	E. J. Parnell, Junr.	do
* Abutments and Wings of a Bridge	G. W. R. Co.	W. A. Loughran	July 30
* Widening a portion of the Line between Oxford and Reading	do.	do.	do
* Widening a portion of the Line between Telford and Tupton	do.	do.	do
* Cast-iron Pipes, Shute Cocks, &c.	Taunton Local Board	H. Bancroft	do
* Road-making and Pavement Works	H. Mair, Viceroy	Prof. H. Robinson	do
* Purchase of Brick and Woodwork	Wimborne & Putney	Mr. Hope	do
* Materials for Road	Wimborne & Putney	Official	July 31
* Post Office, Kebley	Com. of H. M. Works	do.	Aug. 1
* Drainage and Maining-up Streets	Wimborne & Putney	do.	do
* Pulling down Buildings, and other Works	Wimborne & Putney	do.	do
* Road-making and Pavement Works	Wimborne & Putney	do.	do
* School Buildings and Residence	Wimborne & Putney	do.	do
* Works and Materials	Wimborne & Putney	do.	do
* Construction of Graving Dock	Wimborne & Putney	do.	do
* Erection of Wards	Wimborne & Putney	do.	do
* Street Bridges and Abutments, River Tour	Wimborne & Putney	do.	do
* Mission Hall, School, Club, &c.	Wimborne & Putney	do.	do
* Painting, &c. at School	Wimborne & Putney	do.	do
* Convent, St. Joseph's, Portmarna, Ireland	Wimborne & Putney	do.	do
* Cemetery, Stanley, Co. Durham	Wimborne & Putney	do.	do
* Re-building Premises, South Shields	Wimborne & Putney	do.	do

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be received.
* Prisoner	Directors' Com. Prison	350	July 21
* Surveyor	Torquay	Not stated	July 22
* Clerk of Works	Osborne Local Board	Not stated	July 23
* Surveyor's Assistant	Osborne Local Board	Not stated	July 24
* Assistant for Measuring Surveyor's Dept.	School Bd. for London	Not stated	July 25

Competition, p. ii. Contracts pp. ii., xiii., and xiv. Public Appointments, xvii.

**BURLEIGH (Staffs).—**For additions to manufactory, for Messrs. Doulton & Co. Mr. A. R. Wood, architect, Tunstall. Quantities by the architect:—  
J. T. Clark, Hanley ..... £1,173 0 0  
J. Procter, Tunstall ..... 1,140 0 0  
York & Goodwin, Tunstall ..... 1,124 10 0  
N. Bennett, Burleigh ..... 1,109 0 0  
Jas. Bowden, Burleigh ..... 1,100 0 0  
Jas. Bridley, Burleigh ..... 1,100 0 0  
Wm. Grant, Burleigh ..... 1,080 0 0  
J. J. Longden, Burleigh ..... 1,040 0 0  
Chas. Cope, Tunstall ..... 968 0 0  
Wm. Cooke, Burleigh (accepted) ..... 968 0 0

**BURY ST. EDMUNDS.—**For the erection of the new Alliance Assurance Company's Office, Abbeygate-street, Bury St. Edmunds. Mr. John S. Corder, architect, Wimbourne House, Ipswich.  
Shillito & Son (accepted) ..... £23,000 0 0

**CAERLEON.—**For the erection of police quarters at Caerleon, Mon., for the Standing Joint Committee. Mr. Wm. Fanner, F.S.I., County Surveyor, Newport, Mon. —  
T. C. Diamond, Newport ..... 630 0 0  
J. Francis & Son, Newport ..... 640 0 0  
J. Linton, Newport ..... 620 0 0  
Moulton & Browncombe, Newport ..... 572 0 0  
[County Surveyor's estimate, £550.]  
\* Accepted.

**CAERPHILLY.—**For constructing a new road between Gwyn-y-domen and Van, near Caerphilly, for the Landaff Highway Board. Mr. J. H. Holden, Surveyor, Llanfair.  
Thomas Stradling, Rudry, Caerphilly (accepted) ..... £140 17 6  
[No other tenders received.]

**CARMARTHEN.—**For heating the Shire Hall by hot water, for the Joint Standing Committee. Mr. Daniel Phillips, County Surveyor, Union-street, Carmarthen:—  
T. Evans, Liverpool ..... £171 10 0  
C. Chapman, Carmarthen ..... 167 18 6  
Wood & Co., Bristol ..... 139 15 0  
Metcalf & Dilworth, Preston ..... 133 14 0  
Towry Works, Carmarthen ..... 125 17 6  
E. A. Rogers, Carmarthen ..... 124 15 0  
J. C. Vaughan, London ..... 121 10 0  
Old Foundry Co., Carmarthen ..... 113 0 0  
[County Surveyor's estimate, £133.]  
\* Accepted.

**COLDRED (Kent).—**For repairing the parish church of St. Pancras, Coldred, Kent, for the Rev. C. B. Sturges, Mr. E. P. Loftus Brock, F.S.A., architect. —  
Wilson, Canterbury ..... £463 8 0  
Stiff, Dover ..... 397 0 0  
Adcock, Dover (accepted) ..... 390 0 0

**CROYDON.—**For erecting new boys' class-room at the British Schools, Tamworth-road, for the Committee. Mr. Alfred Broad, architect, 27, Dingwall-road, Croydon:—  
Brown ..... £220 0 0  
Smith & Bullard ..... 215 0 0  
E. J. Saunders ..... 210 0 0  
Burton & Son ..... 205 0 0  
F. R. Docking (accepted) ..... 160 0 0  
[All of Croydon.]

**DUNDEE.—**For extending Small's-lane to Park-place, for the Dundee Police Commissioners. Mr. William Mackintosh, C.E., Burgh Engineer, 19, Commercial-street, Dundee:—  
Bain & Co., 2, Hill-street, Dundee ..... £101 6 10

**HOVE (Sussex).—**For erecting dwarf-wall, cast-iron railings and gates at the Recreation Ground, Hove, for the Hove Commissioners. Mr. H. H. Scott, Town Surveyor:—

**Contract No. 1, Walling.**  
J. Longley & Co., Crawley, Sussex, £1,061 0 0  
C. & F. Cheesman, 47, Gloucester-road, Brighton ..... 1,030 0 0  
Economic Fencing Co., London ..... 935 10 0  
B. C. Badham & Co., Holborn ..... 883 0 0  
A. Crosswell, Western-road, Brighton ..... 709 12 8  
J. G. B. Marshall, College-road, Brighton ..... 692 0 0  
J. Parsons & Sons, Church-road, Brighton (accepted) ..... 680 0 0  
**Contract No. 2, Iron Railing and Gates.**  
C. Smith & Sons, Birmingham ..... 1,451 0 0  
J. G. B. Marshall, College-road, Brighton ..... 1,140 0 0  
J. Every, Lewes, Sussex ..... 1,100 0 0  
P. Wenton, Blackfriars, London ..... 1,093 0 0  
A. Doughty, Great George-street, Leeds ..... 947 8 0  
B. C. Badham & Co., Holborn ..... 885 19 0  
J. Parsons & Sons, Church-road, Brighton ..... 795 0 0  
C. G. Reed & Sons, North-street, Brighton (accepted) ..... 775 0 0  
Lion Foundry Co., London ..... 746 12 10  
Stevens Bros. & Co., London, E.C. .... 733 7 3

**LANGLEY PARK (Co. Durham).—**For alterations and additions to premises at Langley Park, Co. Durham, for the Anfield Plain Co-operative Society, Limited. Messrs. John Smith & Son, architects, Roae Cottage, Shotley Bridge. Quantities by Mr. Geo. Bell, 60, Collingwood-street, Newcastle:—  
H. Brown & Co., 17, Queen-street, Newcastle ..... £780 0 0

**LEYTON.—**For alterations and additions to the Church-road Schools, for the Leyton School Board. No quantities supplied. Mr. J. T. Newnan, architect, 2, Fen-court, Fenchurch-street, E.C.:—  
J. Caley, Leytonstone ..... £2,790 0 0  
Mortor, Stratford ..... 2,750 0 0  
W. Grear, Stratford ..... 2,574 0 0  
P. J. Coxhead, Leytonstone ..... 2,569 0 0  
Lamb & Son, Leytonstone ..... 1,690 0 0  
D. Sayer, Leyton ..... 1,653 0 0  
\* Accepted. † Withdrawn.

**LONDON.—**For rebuilding Horse Repository, High-street, Marylebone, for Mr. William Burton. Mr. Thomas Durran, architect, 44, Upper Baker-street, N.W.:—  
Stevens ..... £2,300 0 0  
Scriveners & Co. .... 1,895 0 0  
Boys & Co. .... 7,751 0 0  
Higgs ..... 7,643 0 0  
Vard, Clarke & Co. .... 7,475 0 0  
H. C. Clifton, Baywater (accepted) ..... 7,333 0 0

**LONDON.—**For overhauling and re-constructing the steam apparatus, and for providing new mains, &c., at the Waterloo-road school, for the School Board for London. Mr. T. J. Bailey, Architect:—  
T. Potter & Sons, Limited ..... £549 0 0  
W. G. Cannon ..... 475 0 0  
Purcell & Nobbs ..... 419 0 0  
T. Green & Sons, Limited ..... 403 0 0  
J. Grundy ..... 398 14 8  
Roser & Russell ..... 368 0 0  
\* Recommended by the Works Committee for acceptance.

**LONDON.—**For the erection of a School to provide accommodation for 2,006 children, on the High Middleton site, Clerkenwell, for the School Board for London. Mr. J. H. Bailey, Architect:—

Patman & Fothering-ham ..... £45,396 ..... £45,096 ..... £45,496  
Colls & Sons ..... 44,775 ..... 44,768 ..... 43,935  
Kilby & Gayford ..... 43,809 ..... 44,049 ..... 43,720  
Grover, J., & Son ..... 43,577 ..... 44,267 ..... 43,567  
Lawrence, L., & Sons ..... 42,534 ..... 43,238 ..... 42,564  
Dove Bros. .... 41,595 ..... 42,589 ..... 42,520  
Mowlem, J., & Co. .... 41,448 ..... 41,087 ..... 40,938  
Pattinson, S., & W. .... 35,312 ..... 35,939 ..... 35,000

\* If brickwork be built in cement.  
† If brick facing be substituted for Terra-cotta facing.  
\* Recommended by the Works Committee for acceptance.

**LONDON.—**For the enlargement of the Wilton-road School, Dalston, by 400 places, and for the erection of a Cockery Centre, for the School Board for London. Mr. T. J. Bailey, Architect:—

If brickwork be built in cement.  
J. Grover & Son ..... £5,208 0 0 ..... £5,309 0 0  
W. L. Kellaway ..... 4,980 0 0 ..... 5,086 0 0  
E. Lawrence & Co. .... 4,595 ..... 4,648 0 0  
Sons ..... 4,808 ..... 5,003 0 0  
Atherton & Latta ..... 5,031 0 0  
G. S. Williams ..... 4,903 0 0 ..... 5,013 0 0  
Dove Bros. .... 4,823 0 0 ..... 4,905 0 0  
Kilby & Gayford ..... 4,722 0 0 ..... 4,804 0 0  
B. E. Nightingale ..... 4,690 0 0 ..... 4,777 0 0  
J. Mowlem & Co\* ..... 4,626 0 0 ..... 4,691 0 0  
\* Recommended by the Works Committee for acceptance.

**LONDON.—**For converting gas radiators into hot-water coils, and for providing hot-water mains, at the Brunswick-road School, Poplar, for the School Board for London. Mr. T. J. Bailey, Architect:—

T. Grundy ..... £161 18 7  
W. G. Cannon ..... 147 0 0  
T. Green & Son, Limited ..... 135 0 0  
R. Crane ..... 120 0 0  
J. Gray Wootton-Smith & Co. .... 104 0 0  
Purcell & Nobbs\* ..... 103 0 0  
\* Recommended by the Works Committee for acceptance.

**LONDON.—**For the enlargement of the St. Dunstan's-road School, Fulham, by 400 places, for the School Board for London. Mr. T. J. Bailey, Architect:—

If brickwork be built in cement.  
Colls & Sons ..... £4,486 ..... £4,541  
Dove Bros. .... 4,473 ..... 4,545  
Kilby & Gayford ..... 4,423 ..... 4,482  
Mowlem, J., & Co. .... 4,365 ..... 4,422  
Longley, J., & Co. .... 4,296 ..... 4,414\*  
\* Recommended by the Works Committee for acceptance.

**LONDON.—**For the execution of drainage, paving, and other works in connection with the Cable-street, &c., Shawfield Artists' Dwellings scheme, for the London County Council. Mr. A. R. Binnie, Engineer:—  
Adams ..... £5,750  
Turner & Son ..... 5,100 0 0  
Mowlem & Co. .... 4,750 0 0

**LONDON.—**For works to be executed in lowering and repairing a portion of Latchmere-road, Battersea, for the London County Council. Mr. A. R. Binnie, Engineer:—  
Nowell & Robson ..... £1,775 0 0  
Mowlem & Co. .... 1,700 0 0  
Randall ..... 1,304 10 0



LONDON.—For alterations and additions to 125, High-street, Shorefield, for the Directors of the London and South-Western Bank, Limited, Mr. Edward Gabriel, architect, 42, Old Broad-street, E.C. 4:—

Hollett	£1,379 0 0
Godfrey & Son	1,359 0 0
Payne Bros.	1,350 0 0
Woodward & Co.	1,340 0 0
Kilby & Gayford	1,372 0 0
Scott	1,247 0 0
Carmichael (accepted)	1,195 0 0

LONDON.—For works to No. 171, Great Titchfield-street, Marylebone, for Mr. Heaton. Mr. Alfred J. Hopkins, architect, 27, Mortimer-street, W. Quantities supplied:—

Oldrey & Co.	£250 0 0
Finch & Son	600 0 0
Finch & Son (reduced and accepted)	500 0 0

LONDON.—For building factory in rear of 57, Mare-street, Hackney, for Mr. W. Forge. Mr. Joseph G. Needham, architect, 11, Powerscroft-road, Clap-ton, N. N. Thomas (accepted) £462 0 0  
(No competition.)

LONDON.—For alterations to the "Coach and Horses" public-house, Mile End-road, for Mrs. Speaight. Mr. Joseph G. Needham, architect, 11, Powerscroft-road, N. Quantities supplied:—

Gould & Brand	£593 0 0
Mower & Son	573 0 0
J. A. Taylor	559 0 0
A. Hood	513 0 0
Walker Bros. (accepted)	498 0 0

LONDON.—For making-up and paving Gilestad-road, for the Vestry of Fulham. Mr. W. Sykes, New Streets, Surveyor:—

Nash, Fulham	£769 0 0
Greenham, Hammersmith	755 0 0
A. J. Taylor	659 0 0
Tomes & Winpey, Hammersmith	668 0 0
Nowell & Robson, Kensington	617 0 0

LONDON.—For making-up and paving Whittinghall-road, for the Vestry of Fulham. Mr. W. Sykes, New Streets, Surveyor:—

Hudson	£400 0 0
Nash	379 0 0
Greenham	365 0 0
Tomes & Winpey	324 0 0
Nowell & Robson	296 0 0

LONDON.—For alterations to No. 13, Endsleigh-gardens, Euston-square, N.W., also for entire reconstruction throughout and entire reconstruction of sanitary arrangements, for Mr. F. M. Corner. Mr. H. H. Bentley-Gordon, 123, Cannon-street, London, E.C., architect:—

Section I.		Section II.	
Kirby & Chase	£955 0 0	—	—
Scrivenor	867 0 0	—	—
Clarke & Mannoch	737 0 0	£507 5 0	—
Greatorex	706 0 0	540 0 0	—
H. Toten & Sons	683 0 0	510 0 0	—

LONDON.—For the erection of four villa residences at Hillier Green-lane, Lewisham. Mr. Albert L. Guy, architect:—

Sanders	£1,800 0 0
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LONDON.—For alterations and repairs at the "Flough" public-house, Lewisham, for Messrs. H. & V. Nicholl, Limited. Mr. Albert L. Guy, architect:—

W. Phippen	£130 0 0
Pritchard	85 0 0
Hoare	85 0 0
J. Fisher (accepted)	69 0 0

LONDON.—For the erection of caretaker's lodge at the Lewisham Grammar School for Girls, for the Governors. Mr. Albert L. Guy, architect, 75, High-street, Lewisham:—

Staines & Son	£350 0 0
D. & J. Kennard	347 0 0
S. J. Jerrard (accepted)	320 0 0

LONDON.—For furnishing at the Lewisham Grammar School for Girls, for the Governors. Mr. Albert L. Guy, architect:—

Geo. Hammer	£1,058 0 0
Wake & Dean	936 0 0
Educational Supply Association	883 0 0

Blinds.

Geo. Beck	60 0 0
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\* Accepted.

LONDON.—For the erection and completion of business premises at Kilburn, for Mr. G. Nesbitt. R. D. Hanson, architect, The Red Tower, Kilburn, N.W.:—

H. B. Oldrey, Kilburn (accepted)	£3,111 0 0
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LONDON.—For certain alterations and additions at 45, Wellington-road, St. John's Wood, for the Young Women's Christian Association. Messrs. Elliott, architects, 40, Chancery-lane, W.C. 2:—

Densham Bros.	£560 0 0
Walker	518 0 0
Myring (accepted)	509 0 0

LONDON.—For alterations and additions to Church-field Hall, Acton. Mr. Hampden W. Pratt, architect, 4, Duke-street, Adelphi, W.C. 2:—

Maple & Powell	£850 0 0
W. Shepherd	750 0 0
Nye	740 0 0
Carmichael	740 0 0
Penny & Co.	735 0 0
Bacon & Co.	735 0 0
Tilley	725 0 0
Lyford	722 0 0

LONDON.—For erecting a block of buildings at Horseley Rise for Mr. William Walkley. Messrs. G. Carter & Son, architects and surveyors, 51, Holloway-road:—

W. Goodman (Hartman Works)	£2,623 0 0
Norris & Luke, Grove-lane	3,274 0 0
George Jackson & Co., Stroud-green	3,190 0 0
T. D. Lowns & Sons, Arkhol-road	3,075 0 0

LONDON.—For painting, whitewashing, &c., the Workhouse, Mile-end, E., for the Mile-end Board of Guardians. Mr. Wm. Thacker, surveyor, Guardians' Office, Bancroft-road. The value of the works to be done under the supervision of Mr. Chas. Fredk. Burden, Superintendent of Works, by whom the specifications were prepared:—

C. D. Barker	£748 15 0
G. Flaxman	706 0 0
T. White & Son	705 16 0
Vickard & McBride	665 10 0
J. Gilbey	663 17 6
W. Simms	603 0 0
J. Matthews	587 15 0
S. Judd & Son (accepted)	568 14 6
C. N. Phillips	549 0 0
W. Proot	549 0 0
Martin & Barclay	531 0 0
T. Humphreys	489 10 0
A. W. Derby	457 0 0
G. Barker	439 0 0
E. Crow & Son	336 0 0
J. McDonald	332 10 0
S. Judd & Son (accepted)	322 0 0
W. J. Davenport	311 0 0
W. Furniss	232 0 0

LONDON.—For dining-room extension and re-decoration of No. 15, Highbury-place, for Mr. T. Mack. First section of works. Messrs. George Carter & Son, architects, 51, Holloway-road:—

R. Wood, Hamden-road (accepted)	£375 0 0
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LONDON.—For forming road and sewers on the Raleigh Hall Estate, Brixton-hill. Mr. W. Newton Dunn, architect, 1 and 2, Bucklersbury, E.C. 4:—

Including kerb and chalk.		Exclusive of kerb.	
G. Osenton, Westminster	£2,791 0 0	£2,548 0 0	—
Leonard Bottoms	1,987 0 0	1,583 0 0	—
R. Mayo	1,935 0 0	1,610 0 0	—
T. Blackmore	1,845 0 0	1,505 0 0	—
E. Fell & Sons	1,730 0 0	1,480 0 0	—

LONDON.—For the erection of additional factory at Kintore Works, Grange-road, Bermondsey, S.E., for Messrs. J. H. Thomas:—

W. H. Pritchard	£237 0 0
T. Rider & Son	318 0 0
H. J. Williams, 18, Bermondsey-street	310 10 0

\* Accepted.

MAIDSTONE.—Accepted for the supply of road materials for the Maidstone Local Board. Mr. W. G. Spooner, C.E., Borough Surveyor:—

E. Anderson, Maidstone, Bombay a d.	
Granite	8 3 per ton.
J. Rannells, Aylesford, Penise Eivan	9 6 "
T. Wagon, Peniseford, Pit Plints	3 6 per yard.
S. Verrall, Aylesford, Pit Gravel	2 0 "

Surface-Picked Flints.

Bosley-road	3 11 "
Heath-road	3 11 "
Sandling-road	4 5 "
Sandy-lane	3 11 "
Fair Meadow	4 4 "
Loose-road—Jesse Ellis & Co.	5 2 "
Ashford-road—C. Brown, jun.	4 4 "
Tonbridge-road—Jesse Ellis & Co.	5 4 "
London-road—S. Hooker	4 6 "
Tovil—C. Brown, jun.	4 8 "
Otham-road—S. Hooker	4 9 "

Kentish Rag.

Penenden-street Depot—T. Goodwin	4 0 "
Fair Meadow—J. S. Gabriel	2 9 "
Mill-street—W. Freeman	3 8 "
Loose-road—J. S. Gabriel	3 9 "
Ashford-road—T. Allender	3 0 "
Gatling-lane—E. S. Tappin	2 11 "
Buckland-road	4 8 "
Dover-street Depots	2 9 1/2 "
Hartup-street	2 9 1/2 "
Asylum-road	2 9 "
St. Peter's-road	3 8 "
Old Tovil-road—S. Sills	3 3 "
Hermitage-lane—S. Coppard	2 11 "
London-road—J. S. Gabriel	2 7 1/2 "
Tovil—S. Sills	3 3 "
Otham-road—W. Rouse	4 0 "
Stocking-lane—S. Sills	3 3 "

MOW COP (Staffs).—For the erection of school buildings for 320 children, with caretaker's residence, at Mow Cop, for the Wolverhampton School Board. Mr. A. R. Wood, architect, Tunstall. Quantities by the architect:—

James Boon, Mow Cop	£2,547 5 6
C. W. Machin, Bradley-green	2,331 0 0
Chas. Smith, Tunstall	2,262 0 0
Wm. Grant, Burslem	2,259 0 0
York & Goodwin, Tunstall	2,190 0 0
J. J. Longden, Burslem	2,138 0 0
Chas. Cope, Tunstall (accepted)	2,084 0 0

NEWARK.—For building a 180-quarter malting at Newark, for Messrs. R. Bishop & Sons. Mr. Geo. Sieppard, architect, Newark:—

Shillitoe & Sons, Bury St. Ed.	£12,000 0 0
munds	10,400 0 0
Lowe & Sons, Burton-on-Trent	10,400 0 0
Smith & Lunn, Newark	10,073 0 0
S. F. Halfday, Stamford	9,973 0 0
Hy. Vickers, Nottingham	9,800 0 0
C. Mackenzie & Sons, Newark	9,799 0 0
C. Baines, Newark	9,760 0 0
F. Messon, Nottingham	9,731 0 0
T. Cuthbert, Nottingham	9,665 0 0
T. Hands, Grantham	9,643 0 0
Hewins & Goodland, Grimsby	9,573 0 0
E. Hind, Nottingham	9,477 0 0
J. Wright, Nottingham	9,475 0 0
S. Sherwin, Boston	9,473 0 0
Geo. Brown & Sons, Newark	9,300 0 0
Joseph Shaw, Nottingham	9,100 0 0
Wheatley & Maule, Sherwood-street, Nottingham (accepted)	9,043 0 0
J. Hodson & Son, Nottingham	8,950 0 0

For Iron Columns, Girders, &c.

Bradley Bros., Newark (accepted)	1,646 11 0
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NEWPORT (Mon).—For re-building premises, Commercial-road, for Mr. R. J. Searles. Mr. Alfred Swaah, architect and surveyor, Newport:—

Geo. Wilkins, Newport, Mon.	£1,173 0 0
Chas. Lock, Newport, Mon.	1,168 0 0
William Price, Newport, Mon.	1,140 0 0
Thos. Westacott, Newport, Mon.	1,135 0 0
Jno. Matthias, Newport, Mon.	927 0 0
Thos. Webb, Newport, Mon.	895 0 0
Moulton & Browncombe, Newport, Mon.	863 0 0
Morgan & Roberts, Newport, Mon.	820 0 0
E. Richards, Newport, Mon.	830 0 0
Rees Williams & Son, 47, Raglan-street, Newport, Mon.	863 0 0

\* Accepted.

NORWICH.—For repairing the tower of St. Stephen's Church, Norwich, for the Vicar and Churchwardens. Mr. John B. Pearce, architect, 15, Upper King-street, Norwich:—

W. North, Norwich	£260 0 0
Jno. Downing & Son, Norwich	600 0 0
Joseph Stanley, Norwich	475 0 0
J. Youngs & Son, Norwich	234 0 0

\* Accepted.

NOTTINGHAM.—For two ovens in the Outgaug-lane, Bakehouse, for the Nottingham Board of Guardians. Mr. A. H. Goodall, Central Chambers, Nottingham, architect:—

F. P. Tunks, Willersden (accepted)	£125 0 0
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RUDRY (Glamorgan).—For the erection of an hotel at Rudry, for Mr. G. A. Trehan, architect, Aberystwyth. John Henry James, Pontypridd. £1,690 0 0  
\* Accepted.

SALISBURY.—For completing four houses in Green Croft-street, Salisbury, for the Trustees of the Salisbury Municipal Charities. Messrs. John Harding & Son, architects, Salisbury:—

Webb & Co., Salisbury	£272 0 0
Jerrard & Stevens, Salisbury	930 0 0
G. Harris, Salisbury	920 0 0
W. J. and C. S. Young, Salisbury	899 10 0
E. Witt, Salisbury	899 0 0
W. Roles, Salisbury	899 0 0
F. Dibben, Salisbury	860 0 0
H. Cooper, Salisbury (accepted)	840 0 0

SHEERNESS.—For 700 cubic yards pit flints and 300 cubic yards of quartzite or granite, &c., to be supplied to the Sheerness Local Board of Health. Mr. Wm. Wallace Copland, Surveyor to the Board, Sheerness:—

Per cubic yard.	
Fonty & Co., Cherbourg	12 d.
Quartzite 12" d.	Alongside.
Wills & Packham, Sittingbourne	Flints 6 6 Including delivery.

R. Hodkin, Sittingbourne

5 8' Including delivery.
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Silas Wagon, Sittingbourne

3 9 Not including delivery.
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\* Accepted.

SYDENHAM.—For the erection of two villa residences at Vanner-road, Sydenham, for Messrs. Norfolk, Mr. Albert L. Guy, A.R.I.B.A., 78, High-street, Lewisham, architect:—

W. French	£1,600 0 0
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TIPTON.—For the supply of paving bricks at Tipton, for the Tipton Local Board. Mr. W. H. Jukes, Surveyor, Owen-street, Tipton:—

Price per superficial yard.	
With Mortar.	With-out Mortar.
d. d. d.	d. d. d.
T. Tranter, Tipton	4 1/2 4 1/2 6 *
J. Davies, Dudley	5 4 1/2 6 *
J. Cashmore, Moreley	4 1/2 4 1/2 5 *
Heath	4 1/2 4 1/2 5 *
H. Burnham, Birmingham	3 1/2 4 1/2 4 *
G. Trencham, Handsworth	4 1/2 4 1/2 4 *
W. Bennett, Bilston	4 1/2 4 1/2 4 *
G. Brown, Walsall	4 1/2 4 1/2 4 *
J. Burnham, Fenton	4 1/2 4 1/2 4 *
G. Smith, Balsall Heath	4 1/2 4 1/2 4 *
Jones & Fitzmaurice, Birmingham	5 1/2 5 1/2 7 *

\* Tenders of Cashmore, Tranter, and Round accepted on condition that they pave all crossings at 5d. per superficial yard.

TIPTON.—For laying-down footpath paving and crossings at Tipton, for the Tipton Local Board. Mr. W. H. Jukes, Surveyor, Owen-street, Tipton:—

10 in. by 5 in.		10 in. by 5 in.	
by 2 in.	by 2 in.	by 2 in.	by 2 in.
T. Bayley, Great Bridge	55 0 0	47 6 per yard.	—
Thibbington Co., Tipton	58 0 0	44 0 0	—
Swindall & Collis, Old Hill	54 6 0	50 6 0	—
Partridge & Grout, Old Hill	77 6 0	—	—
Hill	56 0 0	40 0 0	—
J. Hamblett, Oldbury	59 0 0	53 6 0	—

\* Accepted.

TYNE-MOUTH.—For providing and laying cast-iron water-pipes and fittings, for the Tyne-mouth Rural Sanitary Authority. Mr. Alfred S. Dinning, Engineer, Newcastle-on-Tyne:—

Thos. Dixon, Houghton-le-Spring	£1,027 18 0
John Simpson, Newcastle-on-Tyne	947 15 8
George Smith, Newcastle-on-Tyne	835 0 0
W. Lawton, North Shields	899 10 0
Thos. Bell, Market Weighton	877 12 1
Nicholson & Elliot, Gateshead	810 6 0
Wm. Nicholson, Long Benton	791 19 11
Didcot Bros., Newcastle-on-Tyne	737 2 7
John Carrick, Durham	765 0 0
J. Somerset & Co., Newcastle-on-Tyne	720 0 0
Thos. Hedderley, Walsend	717 0 0

\* Accepted.

**TUNBRIDGE WELLS.**—For alterations and additions to No. 5, High-street, Tunbridge Wells, for the South-Eastern Railway Company.—

White & Humphrey, Tunbridge Wells	£900	0	0
Steedman, Tunbridge Wells	800	0	0
E. Strange, Tunbridge Wells	800	0	0
J. Mason, jun., Tunbridge Wells	832	2	0
Langridge, Tunbridge	831	0	0

Accepted.

**WARRINGHAM.**—For the erection of a new house (terrace) at Warrington, Surrey. Mr. H. Huntly-Gordon, architect, 123, Cannon-street, London, E.C.—

Wm. Thompson, Caterham Valley	£6,189	0	0
F. & H. Higgs, Loughborough	5,400	0	0
Peto Bros., London	5,397	0	0
J. & J. Ward, Warrington	4,092	0	0

**WARRINGHAM.**—For the erection of stabling, coach-house, and gardener's rooms, Warrington, Surrey. Mr. H. Huntly-Gordon, architect, 123, Cannon-street, London, E.C.—

W. Thompson, Caterham Valley	£1,000	0	0
F. & H. Higgs, Loughborough	862	0	0
Peto Bros., London	805	0	0
J. & J. Ward, Warrington	723	0	0

**WENVOE (Gloucestershire).**—For the erection of a new residence at Wenvoe, for Mr. W. Webb. Messrs. Seward & Thomas, architects, Cardiff.—

J. Haines, Cardiff	£5,315	0	0
J. Hopkins, Cardiff	5,128	8	0
E. Turner & Sons	5,067	0	0
W. Bowers & Co., Hereford	5,089	0	0

Accepted.

**WEST HAM.**—For main drainage extension works for the Corporation of West Ham. Bow-bridge Sewer contract, No. 9. Mr. Lewis Angell, Borough Engineer, Town Hall, Stratford, E.—

Neave, Canning Town	£5,039	0	0
Bottoms, Wandsworth Common	5,447	0	0
S. W. . . . .	5,037	0	0
Adams, Kingsland, N.	5,037	0	0
Jackson, Plaistow, E.	5,375	0	0
Cook & Co., Battersea (accepted)	4,951	0	0

**WEST KIRBY (Cheshire).**—For the erection of engine-house, boiler-house, and chimney at the Water-works, West Kirby, Cheshire, for the Hoylake and West Kirby Gas and Water Co., Limited. Mr. Chas. H. Beloe, engineer, 13, Harrington-street, Liverpool. Quantities by Mr. Frank E. Priest, 13, Harrington-street, Liverpool.—

	With Ashlow Chimney.	With Brick Chimney.
Holme & Green, 10, Benson- street, Liverpool .....	£3,683 0 0	£2,515 0 0
Holme & King, Crosshall- street, Liverpool .....	3,666 19 1	3,411 3 3
Roberts & Robinson, Bewin- gton Bush, Liverpool .....	3,464 0 0	3,280 0 0
A. Blankley & Son, 41, Cloughton-road, Birken- head .....	3,339 0 0	3,269 0 0
H. Maylor, 23, Becket-street, Stanley-road, Liverpool .....	3,514 16 3	3,263 2 5
J. Hughes, West Kirby .....	3,309 13 8	3,247 0 4
Kelly Bros., Rice-lane, Walton, Liverpool .....	3,222 11 6	3,300 0 0

Accepted.

**Paving Works: Bromley and Westminster.**—Lists of tenders for these works received too late for insertion this week.

**SUBSCRIBERS IN LONDON AND THE SUBURBS,** by prepaying at the Publishing Office, 19s. per annum (or 4s. 6d. per quarter), can ensure receiving "The Builder" by Friday Morning's post.

#### TO CORRESPONDENTS.

T. E. P. (we cannot publish your design, even though it is by the "People's Architect" as we have not before heard of it.—T. E. P. (we fear the form of your letter is not suitable).—E. P. (no space this week).—P. B. (too small).—W. L. N. (we do not insert tenders without amounts).—W. B. (we regret that we cannot give you any information about the machine in question).—E. J. W. (shall have attention).—J. M. (thanks).—W. P. (ditto).—W. (too late).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication. We are compelled to decline publishing cut books and giving addresses. Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors. We cannot undertake to return rejected communications. Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED. All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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THE INDEX and TITLE-PAGE for Volume LVIII. (Jan. to June, 1890), was given as a Supplement with the last Number (July 19th).

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GLASGOW:

Peteshill-road.



# The Builder.

Vol. LIX. No. 2477.

SATURDAY, JULY 26, 1890.

## ILLUSTRATIONS.

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Sculpture at the Royal Academy:—	
"Old Marjorie": Mr. G. A. Lawson, Sculptor .....	} Single-Page Ink-Photo
Sir Thomas Elder: Mr. T. Woolner, R.A., Sculptor .....	
A Pair of Park Gates: Professor Aitchison, A.R.A., Architect .....	Single-Page Ink-Photo.
Sheffield Municipal Buildings: Design and Plans Submitted in the Final Competition by Mr. F. H. Tulloch ..	Double and Two Single Page Photo-Litho's.

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### The London County Council Improvement Schemes.



It stated briefly last week, in our usual report of the proceedings of the London County Council, the nature and localities of the street improvements which were recommended,

under circumstances then stated, by the Improvements Committee, and mentioned that the consideration of this report had been adjourned till the next (last Tuesday's) meeting. The results of the debate are given in our usual report in another column; but some of the circumstances of the debate seem to call for some further notice than a mere report.

The Improvements Committee seems to have been placed, it must be confessed, somewhat in the position of the knights-errant of old, who were ordered to—

"Ride abroad redressing human wrongs."

They have been commissioned to suggest improvements in London, and to bring up a schedule of those for which Parliamentary powers were necessary. It may be said that they have executed their task with judgment and moderation, and with a due regard to economy. They admit that there were a good many more schemes which they might well have suggested had not economy been a necessary element in their procedure; but they have endeavoured to distribute their favours equally between the various quarters of London; nor do they appear after all to have adopted the part of benefactors going about with offers of help to parishes in distress. On the contrary, most of their schemes were suggested, according to the Report, by applications from the districts concerned, and others were schemes which had previously formed part of the programme of the Metropolitan Board of Works, but had been for various reasons not carried into execution. They are all of the nature of street improvements, and though the Chairman of the Committee seemed to think that a little special pleading was necessary to prove that street improvements were a portion of the duty of a County Council, we do not know that it is likely that point will be contested. This function is in fact left to the Council as

a legacy from their predecessors, one of the complaints against whom was that they drew out various excellent schemes of street improvement which they never showed any disposition to carry out. The County Council has shown, in its formal procedure, a better spirit than this, for on Tuesday it passed all of these improvement schemes which there was time to discuss, viz., the first three; but that there was not time to dispose of more was due to a prolonged debate, the origin and temper of which were certainly not encouraging to those who look to the County Council as our main agent for the promotion of public improvements in London.

The improvements suggested by the Committee are not all of equal necessity or importance; but the first one on the list, the Isle of Dogs bridges and approaches, is perhaps the most important and the most obviously called for of all. The canal constructed by the Corporation of London in 1799 was taken over by the West India Dock Company and converted into a Dock, with a provision that the Company should construct and maintain bridges to accommodate the traffic. The traffic has long since swelled into proportions never contemplated at the time, and the narrow bridges then constructed are so totally inadequate for the traffic that it is stated (and not denied by the opponents of the measure) that there is a continual block, and that carts are frequently kept waiting half-an-hour for passage-way. When the Poplar District Board, two years ago, attempted to obtain a mandamus against the Dock Company to make bridges commensurate with the present traffic, it was held that the Dock Company were not legally liable for making provision further than was required for the traffic at the time of the original Act of 1799; a decision which, no doubt, we must accept as good in law, though it seems little in accordance with common sense or justice. The traffic is essentially a metropolitan one, and here is therefore created a state of obstruction which has long been a scandal. Yet in the face of this acknowledged state of things, a party of doctrinaires in the County Council moved to decline to receive the Report, on the ground that the incidence of the cost for such improvements must first be settled on a wider and what they considered a more equitable basis; in other words, that the principle of "betterment" should be accepted before any such schemes for local improvement were entertained. One member of this party or clique, at a later period in the

debate, had the good sense to protest against this system of obstruction, affirming that while it would be reasonable to adopt this view in regard to such large schemes as the Strand Improvement scheme, it was perfectly unreasonable to make use of it to block smaller measures of local improvement which were obviously of immediate necessity or value. But this gentleman was the Abdiel of his party, and spoke only for himself. With this exception, the whole opposition was carried on simply on the principle of opposing all votes for improvements until the betterment principle should be adopted. It is satisfactory to find that these obstructionists were in a minority; but the minority was a sufficiently numerous and pertinacious one to furnish the gravest apprehension as to the suitability of such a tribunal as this to legislate for metropolitan improvements. The proceedings during a portion of the debate were little less than disorderly, and it is painfully evident that a considerable proportion of members regard the Council as a debating society for the carrying on of a partisan warfare. It is not in this spirit that practical work of any value can be satisfactorily carried on; and it is to be hoped that those who have to elect representatives on the Council, if they really desire the practical work of the County of London to be efficiently carried on, will bear this in mind for the future, and consider the qualities of business ability and practical sense in a candidate, before the capability of making partisan orations.

The second scheme of the Improvements Committee arises naturally out of the first. It is of only partial benefit to provide for acceleration of traffic over the bridges unless an adequate connexion with the great main avenue of Commercial-road is provided. The application of the Limehouse District Board for a widening of Three Colt-street, which runs in a somewhat westerly direction towards Commercial-road, was condemned by the Council's Engineer on account of the tortuous nature of the street and the perception that the widening of its narrowest parts would not avail to render it a good main thoroughfare. It only required a glance at the plan hung up in the Council-chamber to appreciate the force of this objection. The Improvement Committee propose to provide a route in a more northerly direction, running in a straight line from the bridges up to Commercial-road, which requires a new road, 40 ft. wide, over a part only of the route, cutting at right-angles through two or three



streets which lie at right-angles to the line of the bridges. This would open a straight road to which the only objection, as against the Three Colt-street route, is that it falls into Commercial-street rather further eastwards, and as most of the traffic from the dock goes westward, it is argued that this is taking the traffic round the two shorter sides of an irregular triangle instead of reaching the same point along the longer side. This is a logical objection so far, but the nature of Three Colt-street, already referred to, is such as to overbalance the objection. The Limehouse District Board, however, which offered half the cost of the Three Colt-street route, has declined to contribute anything to the route proposed by the Improvement Committee. This seems to argue a want either of public spirit or of practical insight, and the decision arrived at by the Council, to confirm the scheme subject to the condition of the Limehouse Board contributing one-fourth of the cost, is a reasonable one, which we hope that Board, on further consideration, will see the wisdom of accepting.

Of the other schemes the Fortess-road one, also passed on Tuesday, is of less importance than the two just mentioned; at all events its importance is local rather than metropolitan. This may be said perhaps of the next scheme also, that of the road from Evelyn-street to Creek-road, Deptford; but that this latter is a much-needed local improvement is also manifest at once from the plan exhibited. It provides a straight road for main traffic on the line between London Bridge and Plumstead, through a kind of gridiron of narrow parallel streets placed obliquely across what should be the direct line, traffic having at present to go round two sides of the gridiron. The present arrangement of the streets is one which ought never to have been sanctioned at all. The Greenwich Board were willing to contribute 3,000*l.*, which the Improvement Committee deemed insufficient; and though the Southwark and Deptford Tramways Company, which would greatly benefit by the improvement, were willing to contribute 10,000*l.*, on condition of powers for certain extensions of their tramway system, it was judged better to leave them to deal with the local authorities. The recommendation now stands therefore, with the condition that the Greenwich Board contribute one-fourth of the cost.

The proposed Chelsea Embankment improvement consists in a proposal to carry the embankment westwards from Battersea Bridge to Lots-road, reclaiming from the river about  $3\frac{1}{2}$  acres of mud-banks, the state of which at low tide amounts to a nuisance. The opening of the new Battersea Bridge, which will require improved approaches, furnishes an additional reason for carrying out this improvement, which is a most desirable one. Another improvement which every Londoner has long known to be desirable, and indeed may be said to be a necessity, is the widening of High-street, Kensington. In regard to this the report says:—

“The widening of High-street, Kensington, was also one of the schemes included in the Bill of 1889. The scheme of the Metropolitan Board involved the demolition of all the buildings on the north side of the street, and on the east side of Church-street, at an estimated net cost of 169,000*l.* The subject of this improvement has engaged our attention on many occasions, and has led to considerable correspondence with the Vestry of Kensington. We have no doubt that the widening of this important thoroughfare is much needed. Several schemes have been considered by us, namely—

1. That of the Metropolitan Board already indicated.
2. The same scheme, omitting Church-street and the corner public-house.
3. The setting back of the buildings on the south instead of the north side of the street.

We have given the preference to the last suggestion, for the reason that the property which would have to be acquired is less valuable than that on the opposite side of the street, and moreover the suggestion, if adopted, would straighten a considerable curve. It must be admitted that this does not complete the improvement, as for this purpose the buildings on the northern side of the street, from the public-house at the corner of Church-street to Brown's-buildings, would have to be set back.

The first section would effect a widening of from about 40 ft., the present width, to 60 ft.; the second section, when undertaken would effect a widening of from 36 ft., the present width, to 60 ft. We limit our suggestion at present to the first section, because the property to be acquired is not unlikely to be soon superseded by a better class of buildings, hence the cost would be less now than at any future time, while most of the property on the north side of the street in the second section is of a better and more permanent character, and the risk of increased cost arising from delay is not so great. We would gladly urge the undertaking of the whole improvement at one time, but are deterred purely by financial considerations. The estimated net cost of the portion of the improvement now dealt with is 47,000*l.* Possibly a reconstruction of the street on both sides, providing a greatly-enlarged width of road with broad footways, would add to the attractiveness of Kensington, and also add sensibly to the Vestry's income from rates, and would therefore be a not unprofitable investment. But the Vestry declines to contribute even one-fourth of the net cost, or, indeed, anything, averring that the High-street is the main western road, and that, therefore, the widening of the same should be carried out as a metropolitan improvement. Many accidents occur in this thoroughfare, and for this reason we strongly recommend that the improvement, now suggested, be not postponed, provided the Vestry contributes one fourth of the net cost.”

There is something to be said, no doubt, for the contention of the Vestry that the road is a metropolitan highway, but there can be little question that they will benefit indirectly, if not directly, by its improvement at this point, and if the Vestry becomes convinced that the scheme for widening the road may, by their refusal to contribute, be adjourned *sine die*, it is not improbable that they will reconsider their position.

No unprejudiced critic will have read the report of the Improvements Committee without forming a very favourable idea of the business-like manner in which they have accomplished their task, and the general spirit of fairness which pervades it. The Committee has shown that it merits the confidence of the Council and of the public.

The election of Sir John Lubbock as Chairman of the County Council will probably be generally accepted as a satisfactory one; if there is any doubt in connexion with it, it may be as to his capacity for controlling and keeping to the point an assembly which has exhibited so decided a tendency to wander from business into desultory oratory. For an assembly which really meant business no one could be a better Chairman; but a strong hand is required for the position, and it is not often that we can expect to find a Chairman possessing that union of tact with firmness and decision which was so conspicuously exhibited by Lord Rosebery.

#### LINCOLNSHIRE.

THE recently-issued “Handbook to Lincolnshire”\* may be safely termed one of the very best of the whole series. It is no mere compilation from existing authorities, floated by a little superficial personal observation, but the work of a native of the county, who since leaving it for other duties has kept up his knowledge by frequent visits and by a diligent study of books and periodicals bearing upon its history and topography. The handbook is described by its author as “a careful digest of notes accumulated during several years,” “the existing account of every place, wherever it was possible,” having been “revised on the spot.” From our own point of view the book possesses the great merit of exhibiting a thoroughly adequate knowledge of the architectural branch of the subject. The writer is well up in his subject and knows the meaning of terms, can distinguish between styles, and decide with general correctness as to the period of a building, and the accuracy of his descriptions may be safely trusted.

Non-architectural readers may, perhaps, complain of the large space devoted to the technical accounts of churches. Certainly if these were omitted, there would not be very much left.

\* Handbook for Lincolnshire, with Map and Plans. London: John Murray, Albemarle-street. 1890.

But it must be borne in mind that the churches, with the glorious Minster at their head, constitute the chief attraction of the county to an ordinary tourist. It is true that the popular estimate of Lincolnshire, as “all flats, fogs, and fens,” is very far from being correct. The surface is far more undulating and the scenery pleasanter than strangers suppose. But even though those who travel through the county with unprejudiced eyes will probably accept the author's verdict that it is both “pleasant and interesting,” though the “pretty bits” are somewhat sparsely scattered over a very wide area, and are hardly such as to invite visitors for their own sake. Its ecclesiastical architecture, in which it stands unrivalled among English counties, it must be confessed, is the chief attraction of Lincolnshire, and to this the handbook will prove a welcome and satisfactory guide. There is hardly a single church in the whole county, if there be one, which has not a word of notice, and that usually the result of personal observation; and even if it be described as “modern and uninteresting,” the tourist may be grateful for being forewarned, and thus saved from a needless and disappointing expedition; while if he follows the directions given he will not be likely to pass over anything really deserving examination. The introductory sketch of the architecture of the county, Domestic as well as Ecclesiastical, is clear and full, and by its well-arranged subdivisions points out the leading examples in each of the successive styles, and thus presents a chronological *résumé* of the general subject of the greatest value, while the sections devoted to “Church Furniture,” including tombs, brasses, fonts, stained glass, Easter sepulchres, bells, and the like, direct the student of any particular branch of ecclesiology to the objects of interest in his special line. The fine character of the “Towers and Spires” of the county warrant their occupying a separate section. The remarks here show much discrimination. The writer says, with perfect truth, that “in towers alone, without spires, although Boston ‘Stump’ and Lincoln ‘Broad Tower’ stand head and shoulders above any other western and central towers in England, Lincolnshire would have to yield at least to Somerset,” to which we may add Dorsetshire. It is the spires which crown the towers that constitute the great glory of Lincolnshire. In this respect, as the handbook says, “Northamptonshire, which supplied most of the stone for the best work in both counties, is its chief rival.” No spire, however, in that or any other county, with the single exception of that of Salisbury, which stands unquestionably pre-eminent, approaches anywhere near the two famous Lincolnshire spires of Louth and Grantham. Of these, as we are reminded by the handbook, the late Sir G. G. Scott gave the superiority to Grantham, ranking it as “second among English steeples.” In this estimate we cannot agree. We must rank ourselves among those (“good critics” the handbook terms them) “who place Louth above Grantham for perfection of outline, even though its detail, from its late date—the steeple having been gradually erected by the parishioners in the first fifteen years of the sixteenth century—is ‘far inferior.’” But though these two spires are so pre-eminent for loftiness and beauty, “it is not,” as the Handbook remarks, “a case of the rest nowhere,” since, even if Grantham and Louth were absent, this county would still possess some of the finest spires in England. In the Kesteven division, in the south-west of the county, especially their abundance and beauty is “most astonishing.” Three of the oldest of these spires of Early English date, not “mere conical cappings” are found at Frampton, Raucby, and Sleaford, the last of which, having been injured by a storm, has been recently taken down and rebuilt stone for stone. At Long Sutton the tower and spire are justly described as “of almost unique value” as a perfect and unaltered example of an Early English design, all of one date, and of especial importance, as the late Mr. Edmund Sharpe has said, as “conveying an idea of the



manner in which many of the towers of our cathedrals and parish churches, now deprived of their spires, were originally finished." At Stamford two of its six churches, "five of them of considerable interest," have fine spires. That of All Saints' is an excellent example of a Perpendicular design, all of one date, which, as the Handbook says, "affords an instructive comparison with the bolder and stronger work of an earlier date at St. Mary's." Here we have a broach spire of Early Decorated date, of stately beauty, crowning a noble western tower of the preceding style enriched with five tiers of arading. At Ewerby also we have a very fine and lofty broach spire of the same style, which our author describes as "perhaps the best example of its kind in England." Among the crowd of spires, chiefly of Decorated date, which raise their heads around Sleaford, not one of which is overlooked, the "imposing" steeple at Helpringham, with its bold pinnacles and flying buttresses, that of Billingborough, "remarkably slender for its height and singularly plain," Heckington, "unusually severe for the date, and aiming at massive dignity, but somewhat injured by the great size of the pinnacles," and Silk Willoughby (deemed by Mr. Sharpe "an admirable model for a small parish church"), with a tower, "one of the best proportioned in the district," and a later spire, "good in outline though poor in detail," receive discriminating notices. We have not space simply to catalogue the spires belonging to the Decorated and Perpendicular styles noticed in the Handbook. Where so many are of beautiful proportions, it is perhaps unkind to refer to the failures, but the spires of Caythorpe, badly rebuilt after being struck by lightning, and of excessive height and leanness, and its neighbour, Welbourne, may be mentioned as examples of an exaggerated "entasis." The last-named resembles an ill-grown cucumber.

Passing from the towers and spires to the character of the churches generally, we meet everywhere with the same evidence of careful examination and discrimination.

The fine character of the parish churches of Lincolnshire is proverbial; but, as the author of the Handbook reminds us, the same kind of blunder is made about them as about the supposed fenny character of Lincolnshire, by taking one portion—and that not the largest—for the whole. Lincolnshire, in fact, like Yorkshire, is three counties within one shire boundary, the architecture of which varies as much as does their soil and physical condition. These divisions, which go to make up the large county of Lincoln, are called "parts," though once, as in the still larger county of York, they were known as "thirdings," or "ridings." These "parts" are:—Lindsey, the northern division, which claims for its share more than half the county; Kesteven, in the south-west; and Holland, on the south-east, the smallest in area. The architectural richness of these parts is in inverse ratio to their size, Holland being far the richest, and Lindsey the poorest in the size and character of its churches. As our author says:—

"If Lindsey were a county by itself, it would rank below Norfolk, Suffolk, Yorkshire, and Devonshire, and perhaps some other counties, though it has one of the most beautiful spires in the world at Louth, and churches of great beauty or interest at Barton-on-Humber, Bottesford, Grimsby, Kilton, Lindsey, Stow, Tattershall, Theddlethorpe, and many other places. Some of the earliest churches in the kingdom are found round Grimsby and Caistor. But in the whole central Wold district the churches are either very small and mean, or else have been recently rebuilt, so that the average of this great division is not very high."

In the division of Kesteven the churches are very numerous, and are remarkable for the excellence of their masonry, being built chiefly of the fine Ancaster stone, which lends itself to finely-wrought detail, and for the abundance and general beauty of outline of their spires, in which this district can only be rivalled by Northamptonshire and parts of Leicestershire. To quote the "Handbook"—

"The glorious churches of Grantham, Hecking-

ton, and Sleaford would alone be sufficient to raise any county into the first rank, but several others, such as Billingborough, Caythorpe, Claypole, Deeping St. James, Ewerby, Helpringham, Loddington, Navenby, and the principal churches of Stamford, are only a few from a list of public buildings. The finest churches of this division are mostly grouped around Sleaford, or near the line of the cliff from Grantham to Lincoln."

But the district on which Lincolnshire founds its reputation for magnificence of church architecture is the small south-eastern corner, the marsh and fen district, known as the parts of Holland, of which Boston and Spalding are the capitals, which, "curiously enough, has been taken as typical of the whole county for its churches, just as it has for its fens." These churches may be divided into three groups: 1. Those between Spalding and Long Sutton, including Weston St. Mary, Moulton, Whaplode, Holbeach, Fleet, Gedney, and Tydd St. Mary. 2. Those in the triangle formed by Spalding, Donington, and Boston, in which we may reckon Pinchbeck, Gosberton, Swineshead, Bicker, Algarth, and others of almost equal beauty. And (3) the "fine outlying group" on the piece of Holland which juts into Lindsey, a dried-up channel of the Witham, running northwards, having been the original boundary—which embraces Skirbeck, Fishtoft, Frishton, Lecke, Wrangle, &c. Our attention is here justly called to the fact that these magnificent and spacious edifices occur in a district which is completely destitute of building stone of any description whatsoever. And, strange as it may appear, it is to this absence of native building material that their splendid character is due. The most accessible stone quarries were those of the Barnack oolite, a building stone almost unsurpassed in England for fineness of grain and durability, with which the "gotes" and "drains" which intersect the fens afforded easy and inexpensive water-communication. But, as the author says, it is not easy to assign an altogether satisfactory cause for the marvellous size and beauty of these fen churches, most of which must have always been far in excess of the needs of the population of the parishes. The most probable cause is conventual and parochial emulation. "In the line of churches between Spalding and Sutton Bridge there seems to have been a decided rivalry between the monastic houses of Crowland, Spalding, and Castle Acre, and the example once set was contagious to local patriotism." The noble church of Holbeach—which the author of the Handbook, although he allows it a place "in the front rank" as "an admirably complete specimen of the very latest period of flamboyant Decorated, gradually merging into Perpendicular," unduly depreciates as "a failure in the bold attempt to rival Boston"—probably owes its erection to the Bishops of Lincoln, towards the sustentation of whose table its revenues had been granted by the Pope, with the proviso, in December, 1340, that the Bishop was to completely rebuild the chancel *de novo*. The nave, with its wondrously tall and graceful arcade, is of the same date and design as the chancel. We can hardly be wrong in assigning the completion of the church to the same munificent benefactor. Fleet and Long Sutton may be ascribed to the Clunics of Castle Acre, to whom they belonged (this connexion is overlooked in the Handbook in the case of Fleet), while Whaplode and Gedney were connected with the great Benedictine Abbey of Crowland, and Moulton, Weston and Pinchbeck with the neighbouring Benedictine house of Spalding. The rivalry of the great Monastic houses in church building is thus described by Mr. W. E. Foster, in his excellent little history of Whaplode Church, recently published (p. 8), "No sooner had Crowland erected a stone church at Whaplode than Spalding, probably aware of the beauty of the new fabric compared with their then small Saxon church at Moulton, took in hand the present church. Next Gedney was rebuilt by Crowland, then Weston and Pinchbeck and the parish church at Spalding by Spalding." The same writer continues (p. 28): "Thus began a church building rivalry that

gave to the fen country its beautiful churches, built by funds raised by the various abbeyes from their own estates and the gifts of various laymen."

No county probably contains so many examples as Lincolnshire of what the Handbook terms "primitive Romanesque or so-called Saxon." Of these, which are scattered widely over the county from Barton-on-Humber—the best known and most characteristic example—on the north to Little Bytham in the extreme south, and from Wath and Stow on the east to Hough-on-the-Hill on its western boundary, the Handbook provides accurate and intelligent descriptions. Long-and-short work is found in a considerable number of churches, usually at the eastern and western angles of the nave, testifying to the early date of the original fabric: but in Lincolnshire as elsewhere the towers constitute the principal structural remains of this early period. These are by no means infrequent, especially in the parts of Lindsey which, as the Handbook says, "is remarkable for the great number of towers which retain the primitive unbattered style, with mid-wall shafts." These chiefly occur in groups: one near Grimsby, a second near Caistor, and a third near Gainsborough; besides which, isolated examples are found in almost every part of the county. Barton-on-Humber is the only tower which exhibits the "stone carpentry," as it has been called, dividing the rubble faces of the tower into rude panels by strips of masonry, which we see in still more remarkable distinctness in its Northamptonshire namesake, Earls Barton, and at Barnack in the same county. The Lincolnshire towers are usually distinguished from later work merely by their tall, unbattered outline, the rudeness of the masonry of the walls, and the stonework of the doors and windows, and when their top-most story has been preserved, by the coupled windings, with mid-wall shafts, of the belfreys. Two of these towers, Hough-on-the-Hill and Broughton, are remarkable for a semicircular or segmental turret projecting from the west face, similar to that at Brixworth. These turrets now contain spiral stairs, and this was probably their ancient purpose, the steps being then of wood, not of stone. In the Handbook, however, it is suggested that they were originally western apses, the stair being a later intrusion, and that the basement of the tower, with a supposed eastern apse (not an ordinary form in these early churches, which were usually square-ended) "formed the whole of the original church." The same interpretation is suggested, even more confidently, for the rectangular narthex projecting from the west face of the tower at Barton, as at Barnack, and "there can be little doubt that the base of the tower, with its projections east and north, formed the original church." The immense disproportion between the tower and the rest of the church such an idea involves would seem an almost sufficient answer to this suggestion. The church would have been nearly all tower. But a still more complete refutation is afforded by the many instances in which the long-and-short work existing at the angles of the nave, as at the south-west angle at Branston, and, which is still more conclusive, at the north-east and south-east angle, as at Cranwell, Little Bytham, St. Benedict's at Cambridge, and many other places, indicates the dimensions of the original fabric, and proves that they were, in the main, the same with those of the later church. The rectangular annexes at Barton and Barnack were more probably of the nature of a porch, and were employed, as we know porches were in early ages, for many purposes: partly ritual, e.g., the early part of the marriage service; partly judicial, as the south porch of the original cathedral at Canterbury was; and partly educational. The two Lincoln towers which Mr. E. A. Freeman has made so famous, and from which he has drawn such brilliant historical conclusions in connexion with the Conqueror's grant to Colswegen, find their due place in the Handbook, but with a



cautionary proviso. Nothing can rob these towers of their architectural interest, but their historical importance has been lately somewhat lessened by the documentary evidence which points to the churches mentioned in Domesday having been in another locality. "It is extremely doubtful, however," says the Handbook, "whether these two are really the Churches of Colswegen, and not rather two destroyed churches, St. Peter ad Fontem and St. Austin in Baggholm, on the east side of the city and on the northern bank of the river."

The course of our remarks having brought us to Lincoln, we may mention with high praise the account given of that most interesting historic city, and its almost unrivalled Cathedral. The whole occupies more than thirty double-columned pages, of which the survey of the Minster (illustrated by an excellent plan) occupies one and twenty. This latter the author states to be "based upon" that in Murray's Cathedrals, "somewhat shortened and simplified, and carefully revised to the present date." In its clearness and accuracy it leaves nothing to be desired. The author is deservedly severe on the "scraping and clumsy recutting" which eight and twenty years ago destroyed the authenticity of the west front, especially of the great doorways, which are now, to a great extent, substantially modern works. We observe also that he repudiates Mr. E. Sharpe's extraordinary notion that Remigius originally planned his Cathedral for a single western tower as at Ely. The "general and most probable opinion" that he planned two is, without doubt, correct, and it may be regarded as certain that "the foundations of the existing towers are of original work." When describing the Bishop's Palace, the author deservedly censures the "blank and featureless" character of the high wall with which Messrs. Bodley & Garner have deformed the otherwise beautiful chapel they have formed out of the remains of the domestic offices and the solar of St. Hugh's Hall. It is strange, indeed, both that such a blot should have been admitted by the designer, and stranger still that its execution should have been allowed by his employers. But architects are sometimes wilful folk, and expect their "clients" to bow to their decisions, however contrary to their own wishes. The "possible restoration of the Great Hall" which is suggested as a justification of this blank wall, is, we imagine, a far-distant event, if it ever comes to pass. The present generation, and probably some successive generations, will continue to have their eyes offended by a piece of obtrusive ugliness.

Every part of this excellent and well-arranged Handbook furnishes material for observation, but our limits forbid our extending our notice any further. We must conclude by once more commending the volume to our readers, as one of the very best architectural handbooks to any part of England we have ever come across. Not that its merits are exclusively confined to that particular province; history, archaeology, geology, and the other necessary departments of a handbook, all receive their proper notice. But it is this division which chiefly concerns the *Builder*, and to this, therefore, we have confined our remarks.

We should add that the Handbook is furnished with a very complete index, and is illustrated with a good map and some plans. The latter might, with advantage, have been more numerous. Small plans of Grantham, Boston, and other large towns, and of some of the larger churches—Spalding is the only parish church thus honoured—would have been a welcome assistance to visitors.

#### ARCHAEOLOGICAL SOCIETIES.

WE are obliged to defer till next week, for want of space, some account of the meeting of the Kent Archaeological Society, which took place at Canterbury on Monday and Tuesday last, and of the Bristol and Gloucestershire Archaeological Society, which was held at Bristol during this week.

#### NOTES.

NO one would expect that Lord Bramwell's opposition to the second reading of the "London Streets (Removal of Gates) Bill" should be successful in leading to the throwing out of the Bill, but it appears to have had at least this just measure of success, that it has led to some kind of admission from Lord Salisbury that compensation ought to be made to those whose interests were injuriously affected by the removal of the gates referred to. While admitting that whenever he drove to the Great Northern Station he found himself uttering imprecations against "those sacred gates," Lord Salisbury admitted that their lordships would have no right to authorise changes being made in the management of the traffic of the metropolis, which would bring traffic past houses that had hitherto been free from it, without directing compensation to be made. That is all that any reasonable person can want. It is for the interests of the greatest number that the barriers in the Bloomsbury district, at any rate (being on the main route to three large railway stations), should be removed, but it is unquestionable that the few to whom the change would bring a nuisance from which they had been hitherto free, have a moral if not a legal claim to compensation. There is no doubt that the residential character of some streets, and their desirability as places of abode, would be entirely altered by the change.

IT is well that the question of London water supply is being again stirred up. It is true that at the best a considerable time must elapse before any comprehensive scheme for supplying London from a new source and under a central controlling body can be elaborated and brought into action, but the sooner discontent with the present system is brought to a climax the sooner shall we arrive at the ultimate remedy. Not that it would be fair or just to complain of the quality of the present water supply of London in a general way; it is really a wonderfully good one considering how it is obtained and under what interests it is administered; but these questions of source and administration are just the essence of the subject. The drain from the Thames is already injurious to the river, and it must increase if the water companies are to meet increasing demands from this source; apart from the question whether an open watercourse is the best place to look for uncontaminated water. As to the despotic powers of the water companies over the consumers, and the injustice to the latter from this cause, there are no two opinions outside the water companies and their shareholders. As to the unsatisfactory nature of the present sources of supply there is less general conviction, because it is a subject less generally understood than the levying of rates, and does not "come home to men's business and bosoms" in the same manner; but a very few years more of draining the Thames for water supply will probably bring it home to every one in an unmistakable manner.

WE are entirely in sympathy with much that has been recently said, in more than one quarter, as to the desirability of having a gallery of national art, and also as to the undesirability of making such a collection a mere appanage of the South Kensington Museum, which was instituted for other purposes than that, though a considerable portion of its upstairs galleries is, as a matter of fact, at present filled with a rather heterogeneous collection of English paintings. Mr. Agnew's suggestion of the Kew Palace site is rather doubtful; it is not central enough; but wherever the site may be, why is it to be taken as agreed in advance that we are to have "well-built but simple galleries"? That is to say, an economical building, as cheap as can be had consistently with solid construction. That is too typical an example of the way in which such things are always regarded in England. If people are generous

enough to give pictures to the nation in large numbers, we must probably build a gallery for them; but no extravagance if you please, do not let us attempt an architectural gallery; something "simple"; plain brick walls and a skylight. That is not our idea. A collection of national art should be housed in a manner worthy of the nation, should itself add something to the national architecture. We do not want a building "suitable but plain"; we want a building suitable and noble, without which latter characteristic, indeed, it could not be said to be in the highest sense "suitable" for such an object.

THE Report of the Health of Liverpool in 1889, by Dr. Stopford Taylor, the Medical Officer of Health for the City and Port, draws attention to two important points in regard to sanitary conditions as considered from our point of view. One of these is the injurious effect on the city generally of the great growth and increase of population in what were a few years ago the rural suburbs of the city, but which are now converted into urban districts on the north and south. "This pushing back of the country," says the Report, "from its proximity to the city boundaries, deprives the inhabitants of the inestimable advantages of the healthful breezes so requisite for life, for the pure air cannot gain access to the city without being more or less polluted and devitalised by passing through large masses of population." It is impossible to see how this can be prevented; all that can be suggested is that it renders it still more necessary to continue every effort for the removal of nuisances and the extension of sanitary measures. In regard to the scavenging question, we find on another page a note as to the difficulty of securing frequent removal of domestic refuse, and the difficulty also of knowing where to put it when removed. Have the Corporation authorities given any consideration to the "destructor" system? The other important danger is one with which it ought to be possible to cope, viz. deficiency of hospital accommodation. This was severely felt, it appears, during "the usual increase of scarlatina and typhoid" in the autumnal months. "If," it is added, "we should be visited by an outbreak of epidemic disease, it would be, so far as hospital accommodation is concerned, quite impossible to control it, and the outlook is a most serious one for the health of the community." This is a grave warning, and it is to be hoped the Liverpool City Authorities will not neglect it. We find another significant item in the Report, page 47, as to the neighbourhoods where there was a series of courts from 7 to 11 ft. wide, with back-to-back houses, each house being a *cul-de-sac* within a *cul-de-sac*, "and a common offensive atmosphere pervaded the three rooms into which each house was divided." The average death-rate for three years in this neighbourhood is 46.5 per 1,000, the average of Liverpool being 23.7. The houses have been reported as unfit for human habitation, but we do not read that they have been demolished. A map of Liverpool is appended to the Report, showing by red and blue dots the number of deaths in the year from typhoid and typhus respectively. The position and grouping of these fatal dots ought to be matter of interest to those who are concerned in maintaining the health standard of Liverpool, not too high as it is.

WE observe that on the select committee to consider the Richmond Foot-bridge and Lock Bill, Mr. Moor, the Engineer to the Conservators of the Thames, gave evidence to the effect that any improvement in the river at Richmond by this means would be at the expense of the river below Richmond, which would be silted up by impeding the flow of the tide. Mr. Mansergh followed with the statement that it would undo the work done by dredging for the last eighteen years. We fear this is the truth, and that the prospects for Richmond are poor. Its inhabitants must look forward to improvement when a



The news-room, placed on the right-hand side of the entrance facing the street, has the magazine-room behind. The external walls of the news- and magazine-rooms and the lending library about upon the adjoining property on the east, and in these walls the windows are placed, to which attention has already been called. The main staircase occupies a semi-circular space on the left of hall behind librarian's room, and is top and side-lighted; a stair under this leads to the public lavatory in the basement. The basement also



contains additional book-store, bookbinding-room, and heating chamber, and has an approach from the yard on the west side.

The first-floor shows reference library at back, with a staircase for attendants in the west angle, communicating with the lending library. A book-store is placed over news- and magazine-rooms, adjoining the latter, whilst the ladies' reading-room is placed over entrance vestibule, with balcony over the porch, and a separate lavatory adjacent.

A spacious drawing-room for librarian occupies the south-west corner, and is lighted from the front.

The front block is carried up to a second floor, to provide dining-room, kitchen, and three bedrooms, to complete the librarian's residence.

The description of the building submitted by the author not being available for perusal, we assume that the elevations are intended to be executed in red brick and stone dressings. The elevations are pleasing on the whole, though the attenuated columns of Ionic character on each side of the entrance are somewhat open to criticism.

The first-premiated design, prepared by Mr. W. L. Bernard, of Bristol, certainly deserves the position it occupies. It has the peculiarity of having been designed with a view to the economical employment of female attendants.

A central entrance from Spa-road leads direct to the lending library, occupying a position at the back. The lighting of this room is by windows on the north and west walls, which do not abut on the boundary. The east wall adjoins on the boundary, but has no windows.

On the left of the entrance the news-room is placed with access from the lending library, and similar access is provided to the magazine-room, placed on the right side of the entrance.

A private entrance to the librarian's apartments in the centre of east boundary is reached from Spa-road by a colonnade adjoining the magazine-room. The librarian's room adjoins the entrance and occupies the corner space on this side of the site.

The reference-library, book-store, and ladies' reading-room occupy the first-floor, whilst the second-floor is devoted to librarian's quarters, which somewhat lack convenience of arrangement.

Mr. Henry T. Hare is the author of the design which receives the second premium.

This design differs from others in several respects. The ladies' reading-room has been placed on the right of entrance, facing Spa-road, with news-room behind, magazine on left of entrance, and librarian's room adjacent. The lighting of the lending library has been effected by windows placed in the side walls, which are set back from the boundary.

The first floor accommodates book-store, reference library, and librarian's principal rooms; but the two unlighted store-rooms in the centre of the building are hardly required, and the kitchen quarters might have been extended with advantage.

The front elevation of this design is pleasing, but the side elevation does not maintain its promise.

The third premium has been allotted to Mr. James Broadbent, of Manchester. This plan shows windows overlooking the Town-hall premises, the librarian's entrance also opening directly on to these premises.

It is difficult to understand how the Commissioners reconcile these points in the design with their printed conditions, or with their award of the third premium.

There are several designs unnoticed which show evidence of very careful consideration of the peculiarities of the site, and of much merit; and we consider that one, at least, of the premiums might have been otherwise awarded with a greater show of fairness.

**PARK AREA OF THE CITY OF NEW YORK.**—The Park Board furnished the Census Bureau on June 20 with the following statistics regarding the City parks.—The total number of parks is placed at fifty. Forty-eight of this number, with an area of 3,306 acres, are within the City limits. The area of water in the Central Park is 43 acres, and in the new parks 1,148 acres. The land for the Central Park cost 5,028,834 dols. 10 cents.; for Riverside Park, 6,173,621 dols. 80 cents.; for Morningside Park, 1,874,388 dols. 40 cents. The length of park roadways is 33 miles. The average maintenance for the past ten years was 609,603 dols. per year.

**ELECTRO-DEPOSITED COPPER.**—Owing to pressure on our space we are compelled to defer to next week the promised article on this process.

## THE ARCHÆOLOGICAL CONGRESS AT OXFORD.

[CONCLUDED.]

ON Friday morning, soon after breakfast, the archæologists were off by train to Witney, and on arriving they made their way on foot to the parish church, dedicated to the Holy Trinity, which they inspected, and the leading features of which were explained by the Vicar, the Rev. W. F. Norris. Its beautiful central tower and lofty spire were much admired, as was the size of the transepts, which offers a striking contrast to the small dimensions of the Early English chancel. The tower also is of the same period, the north transept is mainly Decorated, while the clearestory and western door are both of Perpendicular date. The party also took a hasty glance at the Market Cross, which was erected towards the end of the reign of Charles II., and at the old "College," which is said to have been built during a visitation of the Plague for the benefit of the Scholars of Corpus Christi College, Oxford, to whom it still belongs.

The name of the town of Witney (Witan-eye) is of historic interest, as marking one of the places where in the Saxon days the Witan or wise men were called by the King to sit in council, foreshadowing our more modern Parliaments. A century or more ago Witney was one of the chief seats of the blanket manufacture, the water of the river Windrush, on the banks of which it stands, being celebrated for some sulphurous properties which give the blankets a peculiar whiteness. But of late years this manufacture has decreased, owing to the rise of our northern centres of industry, as is shown by the deserted Hall of the Old Blanket-makers' Company, which was built as recently as the year 1721.

After leaving Witney, the party drove on through a dreary open country to Minster Lovel, with its picturesque church, and the ruins of its venerable Priory close by. Here was the seat of the ancient family of Lord Lovel, built about A.D. 1400. The estate was formerly called simply Minster; and the chief buildings, which still remain, are the ruins of the old hall, with a deeply moulded and groined Gothic porch, and some other interesting details, mostly of the Perpendicular style. But both these ruins and the picturesque church the party were forced to inspect hurriedly, having to make their way on to Burford.

The parish church of Burford, dedicated to St. John the Baptist, stands on the banks of the Windrush, close to the ancient stone bridge by which that river is crossed. It has a central tower of Norman date; but throughout the building Perpendicular work is curiously intermingled. The fan tracery of the south porch is much admired, and so are the "parvise" over the porch, and the monuments in the north and south aisles and other parts, including one to Sir Lawrence de Tanfield, whose daughter was the wife of the gallant Lord Falkland, who fell on the battle-field of Newbury.

The party also inspected the picturesque Priory, once belonging to the Hospitaller Order of St. John, and afterwards the property and residence of the celebrated Speaker Lenthall, to whom it was granted by the Long Parliament, and who made it his residence for many years.

A carriage drive to Sipton, or, as it is here styled, Sipton-under-Wychwood (where are a fine Early English parish church and the remains of a small religious house), brought the archæologists back to the railway, where they were fortunately timed to catch the afternoon train back to Oxford, which they reached about five p.m.

At the evening meeting, which was held, as usual, in the new Examination Schools, Mr. A. J. Butler, M.A., of Brasenose College, in the chair, two papers were read; the former, by Mr. J. Park Harrison, M.A., on "The Saxon Church of St. Leonard's, at Wallingford"; and the other by Mr. W. De Gray Birch, F.S.A., on "The Isis as it appears in the Saxon Charters."

The last-named paper, raising as it did some curious etymological questions, was followed by an animated discussion, in which the Chairman, Mr. Bruton, Mr. Laxton, Mr. Walford, Mr. Wright, and Mr. De Gray Birch took part. Just before the close of the proceedings Mr. Butler exhibited the original emblem of the nose of brass, or bronze, which had been lost sight of for the last 400 years or more, having been affixed to the wall of a house at Stamford, which was used by the members of the College

for some two or three years, when they made a "secession" thither from Oxford, either on account of a visitation of the Plague or "Black Death," or, as others are more inclined to believe, on account of a prolonged quarrel between the Oxford scholars who lived to the north of the Trent and the "Southerners."

Be this as it may, however, one thing is certain, namely, that only the week before last this ancient treasure was recovered by the College and brought back to Oxford. It was considered by Mr. Cope, and by other gentlemen who had special knowledge of antiques, to be of ancient Italian, and probably Venetian, workmanship; and very possibly before the end of the long vacation it will once more adorn the gateway of the venerable College to which it gave its name. Doubtless, when the College was only an "inn" or "hostelry" the brassenose (*Æneus Nasus*) served as a sign; assuming this supposition to be true in fact, in all probability the object exhibited by Mr. Butler is the very oldest inn sign now existing in England; and it is the common idea that the College foundation for the common idea that the College was so called because it covers the site of the Brasinium, or royal "brasing" or "brewing" house, once attached to the hall. In the course of the discussion which followed, Mr. Walford raised this very question, and elicited from the Chairman the reply that, so far as the records of the College showed, there was no ground for supposing that any portion of its site was ever used as a brew-house, either royal or collegiate.

Saturday was devoted to a long drive to Dorchester and Ewelme, returning by way of Wallingford and Nuneham. It is needless to say that the party were very grateful to the Vicar of Dorchester Abbey Church, the Rev. Mr. Poyntz, for an admirable paper on its fabric, its history, and its modern restoration, which he read to them when they were assembled in the church; nor is it needful to say how much the Early English windows, especially those of the north aisle, were admired. The celebrated "Jesse" window in the chancel was pointed out, and the Norman font of lead, and the monuments of knights, judges, and churchmen, mostly of the Decorated or Edwardian era. The original church of St. Peter and St. Paul at Dorchester was founded in the seventh century by St. Birinus, who made it an Episcopal See; but after the Norman conquest, St. Remigius, its then occupant, removed it to Lincoln. It was a thousand years ago the largest See in all England, including as it did many if not most of the counties now included in the dioceses of Winchester, Salisbury, Oxford, Lichfield, and Worcester. The Manor House to the north of the Abbey Church, and a fine range of ancient monastic barns, were pointed out and described.

From Dorchester a drive of three miles took the party on to Ewelme, where they were shown the fine Perpendicular parish church, with its almshouse or hospital, and grammar school attached. It is a sister church to that of Wingfield\* in Suffolk, and was built by members of the same family. Here Sir Henry W. Acland explained the history and leading features of the fabric, and pointed out the very fine tombs of the De la Poles, Dukes of Suffolk, which divide the chancel from the southern aisle. One of the altar tombs (which, by the way, are all kept in the most perfect condition) commemorates Thomas Chaucer, a son of the poet; it is dated 1435, and from its numerous quarterings is well known to every student of heraldry. The tomb of the Duchess of Suffolk represents that lady with the insignia of the Order of the Garter. Many of the archæologists saw, or thought that they saw, in the Hospital of God's House, adjoining the western tower of the church, a very strong likeness to Lord Leicester's hospital at Warwick. Of the once royal palace of Ewelme very few traces remain, and these there was not time to inspect.

From Ewelme the party drove past Crowmarsh, with its fine Norman doorway, to Wallingford, where they made a hasty inspection of St. Leonard's Church and the grass-grown remains of the once extensive town walls; and were received at the Castle by Mr. J. K. Hedges, who read to them, when assembled on the mound, or mount, in his garden, a short paper on the antiquities of the place.

They afterwards drove along the Berkshire side of the river through Brightwell, past the Romano-British encampment of Snodun, and

\* Visited during the Yarmouth Congress of the Association about eight years ago.



so, by way of Little Wittenham, to Clifton Hampden, where they crossed by the new bridge, and then drove through Nuneham Park back to Oxford, which they reached an hour or so after their proper time.

In the evening the usual "official" meeting was held at the Town-hall, when the Mayor and Corporation exhibited their charters, which are very ancient and very fine, though not in the best of preservation, and also the city mace and a collection of gold and silver plate. The charters were explained at considerable length by the Rev. Mr. Ogle and by Mr. De Gray Birch, who drew attention to the sad condition of the seals attached to them; and the mace and plate were made the subject of some remarks by Mr. George Lambert, F.S.A., who stated that they are probably the finest belonging to any city in England, except London and Southampton.

Sunday (the 13th) was a *dies non*; but Monday and Tuesday were utilised as two "extra days," which were devoted to an inspection of some of the colleges and public buildings of Oxford and its neighbourhood, which had been omitted in their peregrinations in the previous week. Early on Monday they assembled in the Hall of Queen's College, when Mr. Madan, one of the resident Fellows, showed them over the chapel, library, and common room, and explained the fine collection of portraits for which the place is so famous. The college plate, including its fine trumpet and historic drinking-horn and goblets, was placed on the table for inspection, and it was made the subject of a few remarks by Mr. G. Lambert. At Corpus Christi College, which was visited next in order, the party was received by the President, Dr. Fowler, who exhibited a variety of treasures belonging to, or connected with, the founder, Bishop Fox, who established the College in the reign of Henry VIII. as a home of the "new learning" which came in along with the dawn of the Reformation and, under the auspices of Erasmus and Dean Colet, gradually superseded the old Latin curriculum. In this hall some of the earliest of the lectures of Ludovicus Vives and of other University professors were delivered in the presence of Royalty, the founder being not only a Bishop, but a favourite at Court, and an able diplomatist. Among the other articles exhibited were the golden crozier of Bishop Fox, and the ancient pater and chalice, both of gold, which had been in saying mass, and some very beautiful gold tablespoons of early date. From Corpus Christi College the party went, past Oriel College, to the University Church of St. Mary's, where the vicar, the Rev. E. S. Foulkes, explained to them its history, pointing out its south porch, on which the statue of the Virgin with the child Jesus in her arms, was erected under the auspices of Archbishop Laud, and in the inside of which porch was the old parvium or parvise, where the first University Library was housed, and where the first University examinations were held. He also showed the spots where Cranmer, Latimer, and Ridley were tried for heresy, and where the former stood on a platform, to be abused publicly by the preacher, Dr. Cox, from the University pulpit. He also pointed out in detail the exquisite sculpture at the juncture of the tower with the spire externally, illustrative of the history of St. Hugh of Lincoln.

After luncheon the party visited Wadham College, a post-Reformation foundation, with a handsome hall, chapel, and garden; these were explained briefly by Mr. E. Walford. Lastly they visited St. John's College, where they were shown over the library, hall, chapel, and gardens, by one of the Fellows, Mr. Bidder, who exhibited to them the MS. diary of Archbishop Laud, formerly president of the college, the skull-cap which he wore when he was beheaded, and the walking-staff with which he supported himself on approaching the scaffold. Mr. Bidder afterwards gave a brief history of the College buildings.

On Tuesday, the weather being fine, the Archaeologists drove out to Stanton Harcourt, where they were shown over the mansion once inhabited by Pope, and in the tower of which he translated, at all events one of the books of Homer's "Iliad." They also inspected the great kitchen, almost as fine as the well-known specimen of a kitchen at Glastonbury Abbey. On their way they stopped for a short time at Cumnor, where they saw the "Bear and Ragged Staff" inn, and the site of the old hall in which Amy Robsart met her death. In the parish church also they inspected the tomb of her supposed murderer, Anthony Foster, who is

immortalised by Sir Walter Scott in "Kenilworth." They drove, by way of Eynham, across to Abingdon, where they made a hasty inspection of its two churches and of the scanty remains of its once great Abbey, now embodied in Messrs. Morrell's brewery, whence they returned, by way of Badley and Kennington, to Oxford. In the evening, Mr. E. Walford read before the party a paper on "Oxford in the Olden Days," and with that the work of the Congress was at an end. On Wednesday they went by steamer down the Thames to Reading, where the party broke up after a fairly successful Congress, but one which would have been still more successful had its programme been issued at an earlier date.

#### THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday last, Mr. Haggis, the Deputy-Chairman, presiding.

The first business dealt with was the election of a new Chairman in the place of Lord Rosebery, resigned. Mr. Martineau moved, seconded by Mr. Fardell, that Sir John Lubbock, the Vice-Chairman, be elected Chairman of the Council. A division being taken, the motion was agreed to by 61 votes to 28.

**Superannuation.**—The adjourned report of the Standing Committee with reference to a scheme of superannuation, sick pay, and compassionate allowances for the employees of the Council was discussed, and it was resolved "That the Council do apply in its next General Powers Bill for power to establish a superannuation and provident fund for its employees, and that it be referred to the Parliamentary Committee to take the necessary measures for this purpose." The details of the scheme and consideration of the rest of the report were postponed.

**Public Improvements.**—The adjourned report of the Improvements Committee was then taken, embodying proposals for nine important improvements, as follows:—Isle of Dogs bridges and approaches; for a new street from West India Dock to Bridge-road; Fortess-road, Kentish-town; Evelyn-street to Creek-road; Deptford; Chelsea Embankment extension; Fulham-palace-road and Queen-street, Hammersmith; High-street, Kensington; St. George's-place, Knightsbridge; and the Albert-embankment, Vauxhall. Only the first three of these suggested improvements were dealt with, owing to a lengthy debate consequent upon the important nature of the proposals. With regard to the suggested improvement of the Isle of Dogs bridges and approaches, the report stated that the bridges form the only means of access to the West India and Millwall Docks, and the river frontage of the Isle of Dogs. The traffic, which is for the most part metropolitan, consisting chiefly of heavily-laden wagons and trolleys going to and from the docks, is considerable, while the bridges provide for only one line of vehicles at a time, and consequently the blocks are frequent and the detentions very serious. The four bridges referred to are the following:—

(A) The Preston's-road bridge, which crosses the entrance to the West India Dock basin, and forms a means of communication between Preston's-road and New-road. The bridge has a clear width of road of 8 ft. 5 in. only, the width of the footway on the river side being 2 ft. 2 in., and on the dock side 1 ft. 1 in. The approach to the bridge on the north of Preston's-road side is nearly at right angles to the bridge, and has a gradient of 1 in 36. The approach on the south side has a similar gradient. It is proposed to reconstruct the bridge so as to provide a carriageway 18 ft. wide, and two footways, each 5 ft. wide, and to improve the gradients of the approaches, at a total estimated cost of 9,550*l*. (B) Limehouse-bridge, which crosses the Limehouse entrance to the West India Docks at Bridge-road. It has a clear width of road of 9 ft. 9 in., the width of the footway on the river side being 5 ft. 7 in., and on the dock side 21 in. The approach to the bridge on the Limehouse side has a gradient of 1 in 21 for a length of 85 yards. The approach on the West Ferry-road side has a gradient of 1 in 40. It is proposed to reconstruct the bridge so as to provide a carriageway 18 ft. wide, and two footways, each 5 ft. wide, and to improve the gradients of the approaches, at a total estimated cost of 7,550*l*. (C) City Arms-bridge, which crosses the western entrance to the South Dock, and connects Bridge-road with Ord-

street. It has a clear width of road of 7 ft. 9 in., the width of the footway on the river side being 2 ft. 8 in. and on the dock side 5 ft. 9 in. The approach to the bridge on the north or Limehouse side has a gradient of 1 in 25 for a length of 36 yards, the approach on the south side having a gradient of 1 in 19 for a length of 36 yards. It is proposed to reconstruct the bridge so as to provide a carriageway 18 ft. wide, and two footways, each 5 ft. wide, and to improve the gradients of the approaches, at a total estimated cost of 7,750*l*. (D) West India Dock-road entrance (north end of East Ferry-road) bridge, which crosses the Blackwall entrance to the South Export Dock, and unites New-road with Manchester-road. It has a clear width of road of 8 ft. 3 in., the width of the footway on either side being 2 ft. 10 in. The gradient of the approaches is, on the south side, 1 in 40, and on the north side 1 in 39. It is proposed to reconstruct the bridge so as to provide a carriageway 18 ft. wide and two footways each 5 ft. wide, and to improve the gradients of the approaches, at a total estimated cost of 8,050*l*. The Engineer of the Council recommends that all the bridges shall be swing bridges. The Poplar District Board has expressed its willingness to contribute 10,000*l*. towards the cost of improving the bridges and approaches, such cost being estimated at 33,500*l*., and the London and India Docks Joint Committee have agreed, but on nine conditions, mostly to the effect that the County Council should bear all the expenses of the improvement.

The Committee recommended that subject to the Dock Committee signing an agreement embodying those conditions, and subject to a contribution of 10,000*l*. by the Poplar District Board, powers be sought in the next session of Parliament to enable the Council to reconstruct the foregoing bridges and to improve the approaches thereto.

Mr. Clarke, the Chairman of the Improvements Committee, in moving that the report be received, said that the money which the Committee suggested spending was only 280,117*l*., which represented a charge on the rates of one-tenth of a penny for the first year, diminishing annually. He urged the Council to consider each improvement on its merits.

Mr. Carr-Gomm moved that the Council should not receive the report, as it would be a waste of time to discuss the proposals of the Committee. If the Council agreed to the proposals, and the matter were given into the hands of a Parliamentary Committee, they, in embodying the proposals in a Bill, would add schemes of betterment and areas of influence, with the result that the Bill would be thrown out after a good deal of expense had been incurred.

Mr. Hubbard seconded, and said that he would oppose all improvements until they could get the money from others than the occupiers.

Mr. Lidgett protested against the endeavour which was being made to waste the time of the Improvements Committee which had spent over twelve months in considering the question of the improvement of the neighbourhoods mentioned. It was a matter in which a large number of the people of London were interested.

A division was then taken when the numbers were:—For receiving the report, 69; against, 30. The Council then proceeded to consider the first scheme, for the construction of the Isle of Dogs bridges and approaches.

Mr. Clarke said the Committee were of opinion that the present condition of affairs was a disgrace to them as a community.

Mr. Charles Harrison, in a long speech, said he would oppose the report unless it was agreed that the settlement of all plans, in case of dispute between the respective engineers, should be settled by a Board of Trade engineer.

Mr. Clarke accepted the suggestion.

The Rev. F. Williams said that the improvement should be delayed until the enormous ground value of London could be compelled to contribute to the cost, as well as the Dock Companies.

Mr. Bullivant said the public were perfectly justified in complaining of the state of things at the Isle of Dogs. After one hundred years nothing had been done to improve the locality. In answer to Mr. Williams, it was unreasonable to think that the Dock Companies could be made to pay, for they had no money to spend. After some further remarks, the recommendation of the Committee to construct the bridges was agreed to.

The second recommendation of the Committee was as follows:—

"That power be sought in the next session of Parlia-



ment to enable the Council to form a new street from West India Dock-road to Bridge-road."

In reference to this, the Committee in their report stated that at the present time the provision for the traffic going to and from the eastern side of the Isle of Dogs is very inadequate, there being no direct communication between Bridge-road and West India Dock-road. In connexion with this, the Limehouse District Board applied to the Council in January last for the widening of Three Colt-street, and they are now willing to contribute one-half of the cost, which it estimates at 30,000. Three Colt-street carries traffic from Commercial-road East to Limehouse-bridge. The Committee had inspected the street, which is exceedingly narrow and tortuous, and in the opinion of the Engineer (in which they entirely concurred) would not, even if widened in the parts suggested by the District Board, make a good thoroughfare. They had considered an alternative scheme for the construction of a road of a uniform width of 40 ft., from the West India Dock-road, at the junction of Gun-lane to Limehouse-bridge, and, having regard to the amount of traffic to be provided for, they were of opinion that that would be the preferable plan to adopt. The estimated net cost for property and works is 50,800. The Limehouse District Board had declined to contribute to the improvement. The Committee would be prepared to deal with the suggestion of widening Three Colt-street apart from the consideration of the improvement now reported on.

Mr. Clarke said, in reference to this proposal, that when they gave facilities to approach the bridges they must also provide facilities between the docks and the main roads. The present approaches were quite inadequate.

Mr. Harrison moved that the local authorities should contribute to the cost of the improvement.

The recommendation of the Committee was finally agreed to with the addition of words making it a condition that the Limehouse District Board contributed to the cost.

In reference to the improvement of Fortress-road, Kentish-town, the Committee stated that the Vestry of St. Pancras had applied to the Council to carry out the widening of Fortress-road, Kentish-town, at the point where this road and Highgate-road enter Kentish-town-road. The scheme submitted by the Vestry comprised a somewhat wide area, the idea being to take premises in the rear with the view of recruitment. The scheme also provided for the widening of the road from Leverton-street, Kentish-town-road, up to and inclusive of a large portion of Fortress-terrace. After viewing the locality, hearing a deputation from the Vestry, and carefully considering the proposal, the Committee were of opinion that some improvement is urgently required, and cannot be postponed without grave inconvenience. What was necessary to be done was the widening of the thoroughfare from the entrance of Fortress-road to Fortress-grove, from about 33 ft., the present width, to 60 ft. The estimated net cost is 28,200, of which sum the Vestry has agreed to contribute one-fourth. The traffic passing along this thoroughfare, between London and Upper Holloway, Highgate, Hornsey, Barnet, Finchley, and Wood-green is considerable, and often leads to blocks.

They recommended—

"That, subject to a contribution of one-fourth of the net cost by the Vestry of St. Pancras, powers be sought in the next session of Parliament to enable the Council to carry out the widening of Fortress-road, St. Pancras."

An amendment to refer the matter back having been lost, the recommendation was approved.

The other improvements suggested in the report were postponed.

*Recent Floodings of Sewage.*—Sir Walter de Souza asked Mr. Howell Williams (chairman of the Main Drainage Committee) what steps would be taken in reference to the recent flooding of sewage in Westminster, where the Army and Navy Stores and the Drill-hall of the London Scottish Rifles had suffered, and where disease might occur in consequence.

Mr. Howell Williams having stated that the matter would be reported upon at an early date, said that floodings had taken place elsewhere. On the occasion of the recent downpour of rain, about as much water was carried down the drainage system in two hours as was usually carried down in twenty-four.

The Council adjourned soon after seven o'clock until next Tuesday.

## ARCHITECTURAL ASSOCIATION

### VACATION VISITS:

#### EXCURSION TO OXFORD.

On Saturday last a party consisting of thirty-five members of the Association and thirteen members of the Birmingham Architectural Association spent an enjoyable day at Oxford in visiting, though somewhat hurriedly, the principal Colleges of the University, under the direction of Mr. Edmund Woodthorpe, M.A. Oxon. Reaching Oxford at half-past eleven, the first visit was made to Worcester College, where the gardens, the fifteenth-century old buildings, and the chapel, decorated under the direction of the late William Burges, were the especial points of attraction; then, proceeding past the Taylor Buildings and Martyrs' Memorial, the visitors came to St. John's College, where the gardens and the work of Inigo Jones were both equally admired, and, even thus early in the day, desires expressed by some of the members to sit down and sketch, instead of running about seeing the old buildings. As, however, the programme was to see Oxford in a day, and not to study, it was necessary to hurry on. The next College visited was the modern one of Keble, which, with its gorgeous chapel, is a good example of the work of Mr. Butterfield, and, naturally therefore, came in for a certain amount of criticism from the representatives of the younger generation, who know not the merits of what they call the "streaky bacon" style.

The route taken then led past the Museum, the once highly esteemed work of Messrs. Deane & Woodward, to the interesting College of Wadham, with its manifestation of late Gothic work of the seventeenth century, and its gardens with the famous copper beech and cedar. Passing then from Wadham by way of "The Broad," leaving on the left the new Indian Institute, by Mr. Basil Champneys, which is as yet incomplete, the visitors came to Trinity College, where the work of Mr. T. G. Jackson received far more admiration than that of Wren, or even the carving of Grinling Gibbons. For want of time the Lime Walk was omitted, although now that the limes are flowering this noteworthy feature may be found at its best. The exterior of the new buildings of Balliol, by Mr. Waterhouse, and the colleges of Exeter and Jesus were then rapidly glanced at. Next came the new building of Brasenose, by Mr. Jackson, and passing by the Church of St. Mary, with its famous Virgin Porch of the seventeenth century and its beautiful spire, the party reached the old Examination Schools with the noted "Five Orders" gateway, and then proceeded to the interior of the Divinity School and the Convocation House, both of which attracted considerable interest, architectural and sentimental. Noting the exterior of the Sheldonian Theatre and Hertford College, the visitors next proceeded to view the interior of All Souls' Chapel with its famous reredos, and then to Pembroke College, where the important function of lunch was observed, photographs of the party being afterwards taken. Then came a visit to Christchurch College, with the well-known "Tom" tower, Wolsey's quadrangle, and Hall with its fine collection of portrait-pictures, the kitchen, and then the Cathedral, the small size of which in no way diminished the very great enjoyment that every one seemed to feel in the charming interior with its Norman and Transitional work, and the modern stained-glass windows by Mr. Burne Jones; then, passing through Oriel College, along "The High," glancing at University and Queen's Colleges, the party came to Magdalen, where considerable time was spent in admiration of the old work as well as of the new buildings by Messrs. Bodley & Garner, the Cloisters, Deer Park, and, afterwards, a view of the famous tower from the bridge over the Cherwell. Then came a visit to New College, in the ante-chapel of which a considerable stay was made, listening to the choir practice and looking at the old stained glass as well as the celebrated window by Sir Joshua Reynolds, which can hardly fail to evoke admiration in spite of the unsuitable method of treatment adopted. After this, Merton College, with its fine thirteenth-century chapel, was visited, and the artistic appetite of the visitors being by this time completely satiated, an adjournment was made by way of Broad Walk and Christ Church Meadows to the river and the College barges, where the party broke up into a number of small groups to pass

the remaining time of their stay in various ways according to their several fancies, one and all agreeing that they had spent a most enjoyable day.

### COMPETITION.

**HALIFAX.**—The limited competition for the new Infirmary for Halifax has just been decided. The architects who were invited to send in plans were Messrs. Young & Hall (London); Messrs. Mills & Murgatroyd (Manchester); Messrs. Worthington & Ellgoud (Manchester); Messrs. Horsfall & Williams (Halifax); and Messrs. Otley & Gray (Halifax). Mr. Waterhouse was appointed as assessor, and, after a careful examination of the plans, reported in favour of those numbered 4, which proved to be by Messrs. Worthington & Ellgoud. A resolution to accept and act on the advice of Mr. Waterhouse had been previously proposed and carried. The plans will be open to public inspection for a fortnight, at the Assembly Rooms, Harrison-road, Halifax.

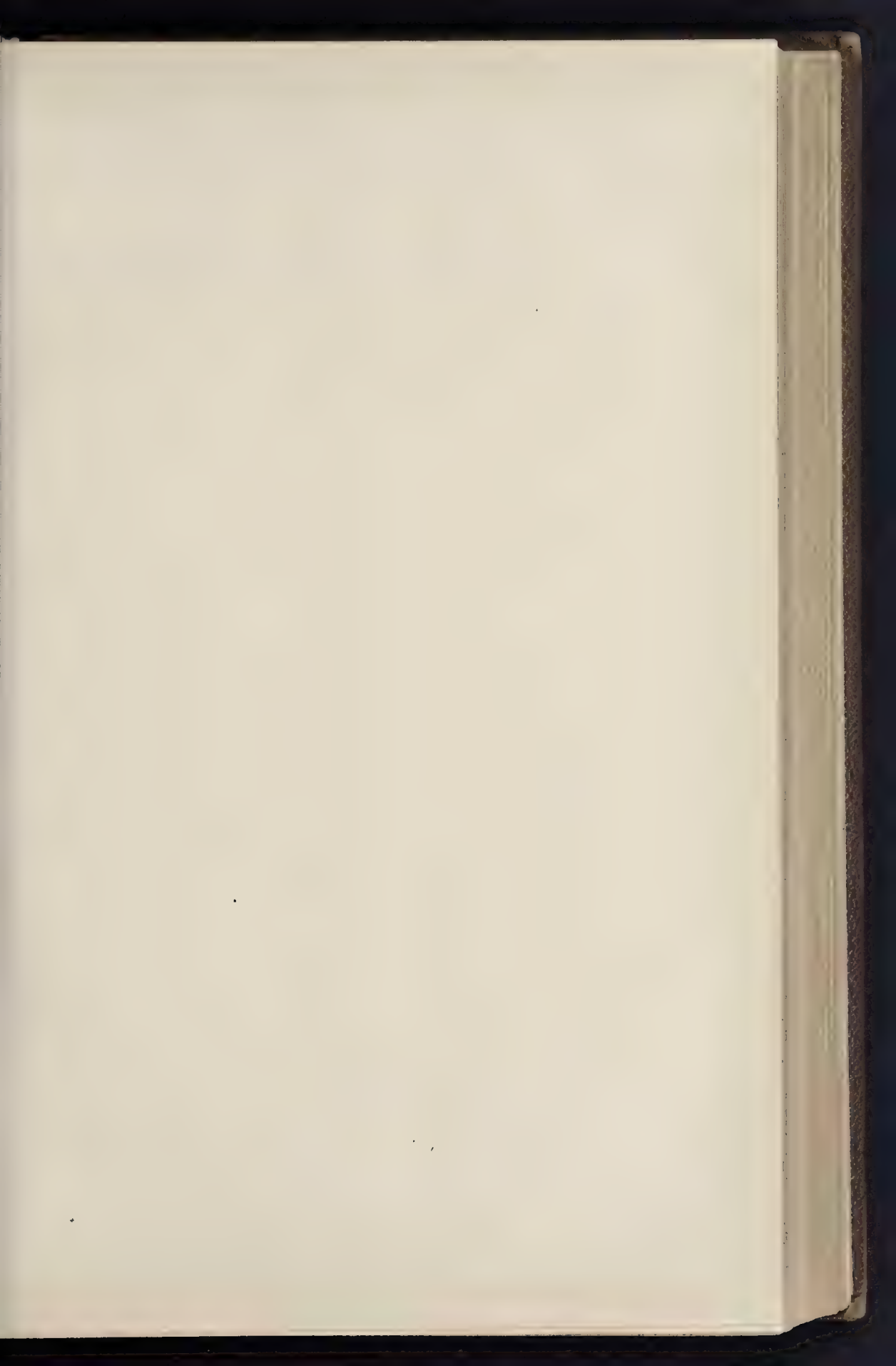
### ENGINEERING SOCIETIES.

**THE SOCIETY OF ENGINEERS.**—An interesting visit was made by the Society of Engineers to the Royal Arsenal, Woolwich, on Friday, the 18th inst. The steamship *Kaiser* was specially engaged to convey the party, who landed at the T. pier. The most noticeable operations carried on at the Arsenal are the squirting of rod-lead, manufacture of small-arm bullets and cartridge-cases, moulding and casting of projectiles in the Laboratory Department; dove-tailing and tenoning, wheel-making, stamp-forging by hammer and hydraulic press, and general engineering work in turning, planing, and slotting in the Carriage Department. In the Gun Factory the casting of steel ingots, forging parts of heavy guns by the 40-ton steam-hammer, turning, boring, and rifling guns of various sizes, trepanning ingots and forgings, tempering steel tubes, and shrinking hoops on guns. Thanks to the courtesy of the officials, the visit was most instructive, and the members spent the whole day in examining the machinery and operations of the various departments. Among those present were:—Mr. Henry Adams (President), Mr. W. Newby Colman and Mr. Wm. A. Valon (Vice-Presidents), Mr. Jabez Church, Professor Henry Robinson, and Mr. A. T. Walmisley (Past Presidents), Mr. J. H. Cunningham and Mr. William Schönheyder (Members of Council), Mr. G. A. Pryce Cusson (Secretary), and Messrs. H. W. Andrews, R. L. Andrews, W. Benbow, F. Brickwell, W. F. Broadberry, W. T. W. Castall, F. H. Chacewright, J. Chute, W. D. Curzon, G. H. Dymoke, J. Elford, B. P. Ellis, W. R. Green, T. Guyatt, F. Hovenden, P. M. Justice, J. Manwaring, M. Mildred, Henry O'Connor, F. W. Quick, B. Rhodes, jun., W. T. Sugg, J. S. Tamburini, E. H. Toulmin, J. Waddington, and Henry Young.

**GIFTS TO MANCHESTER.**—Some splendid gifts, the money value of which represents over 200,000, were made in various forms to the city of Manchester on the 17th inst., when the new Whitworth Park and Institute were formally opened. Whitworth Park consists of a large plot of land formerly known as Potters Park, and with Grove House, which stands in the ground, was purchased by the residuary legatees of the late Sir Joseph Whitworth. The park, to be opened to the public and placed under the control of a trust, and the adjoining land, cost 52,000, and in it are to be built, also at the expense of the Whitworth legatees, some art galleries and a technical museum, Grove House being at present used as a temporary museum. A plot of land is given by the legatees in the city of Manchester, valued at 55,000, on which a technical school is to be erected. The legatees also give 50,000 to be used in the equipment of the institution. Mr. Oliver Heywood, on behalf of the authorities of the Manchester Jubilee Exhibition of 1887, will present to the Institute the surplus from the Exhibition, amounting to over 40,000, 10,000 of which is to be appropriated to the School of Art, 20,000 to the purchase of works of art, and the remainder to the purposes of a technical school. Mr. William Agnew will present, on behalf of Mr. G. F. Watts, R.A., that artist's celebrated picture, "Love and Death," as the first donation towards the furnishing of the Institute. The Duke of Westminster has given, for a nominal consideration, a series of large casts of great value, taken directly from the original sculptures in the Galleries at Florence.—*Standard.*

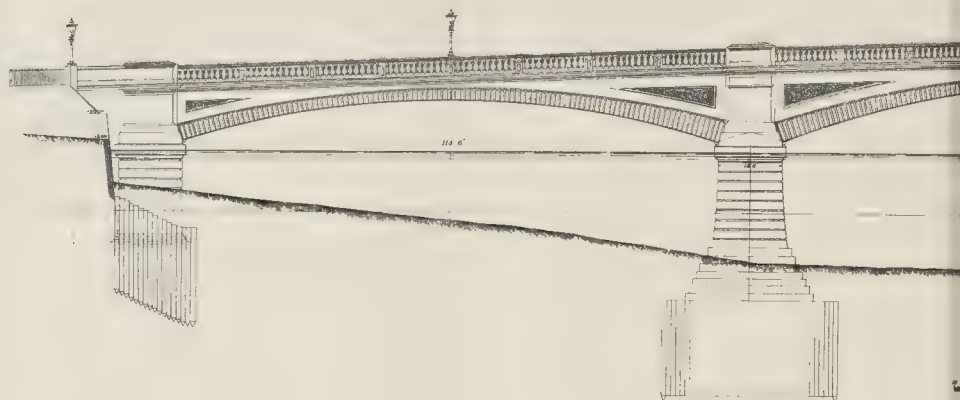
**GOTHENBURG.**—An Industrial Exhibition is to be held next year in Gothenburg. The President is M. Arthur Leffler.





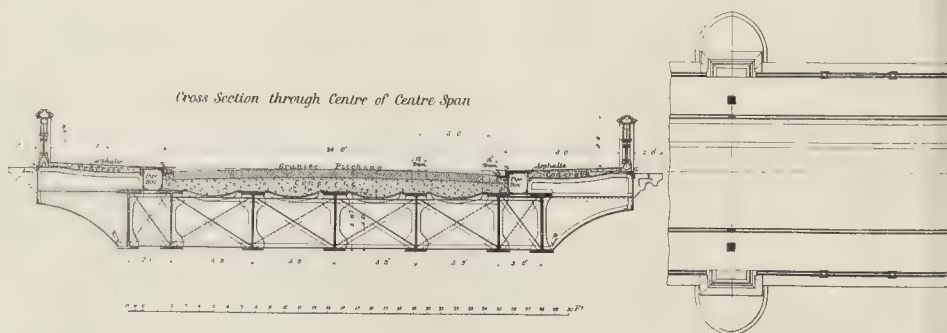
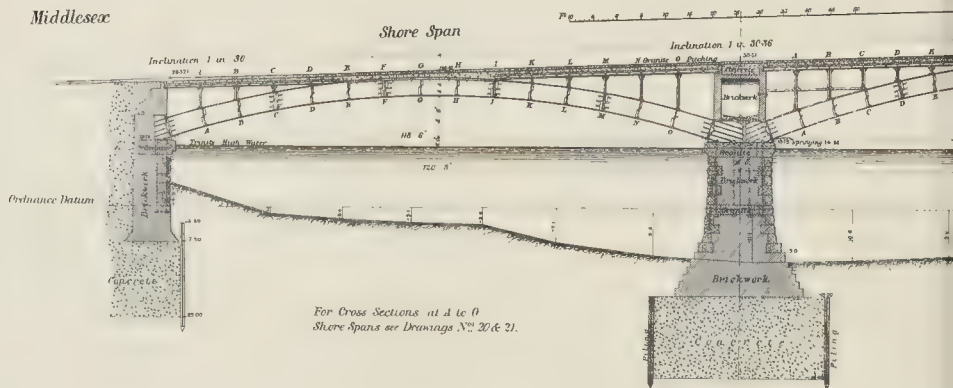
## NEW BATTERSEA BRIDGE.

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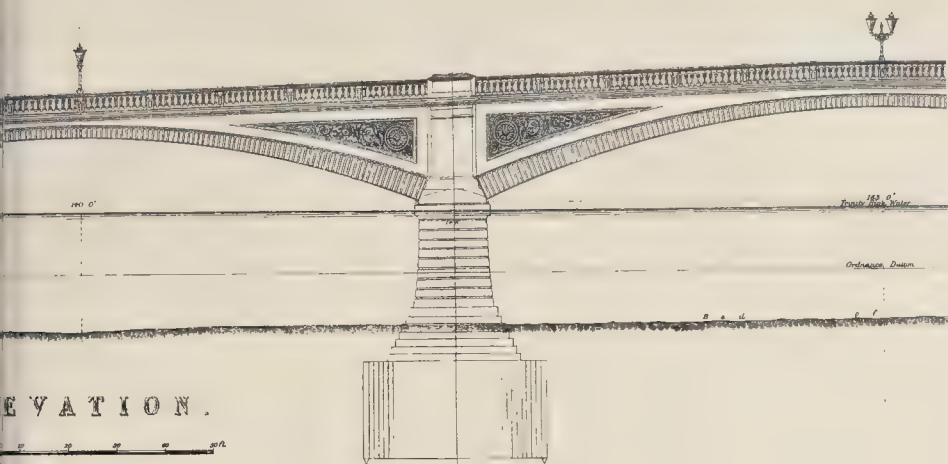


## Half Longitudinal Section

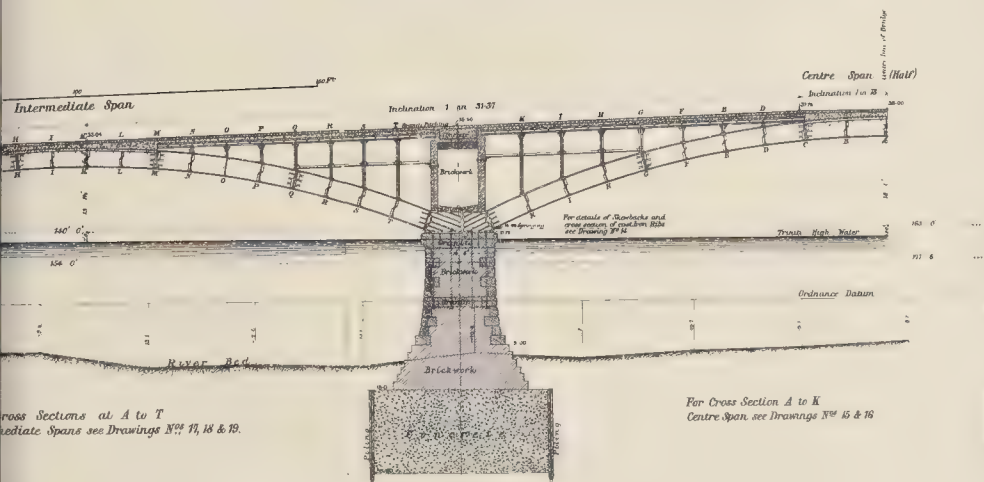
Middlesex

NEW BATTERSEA BRIDGE, OPENED J  
HALF ELEVATION, HALF LONGITU



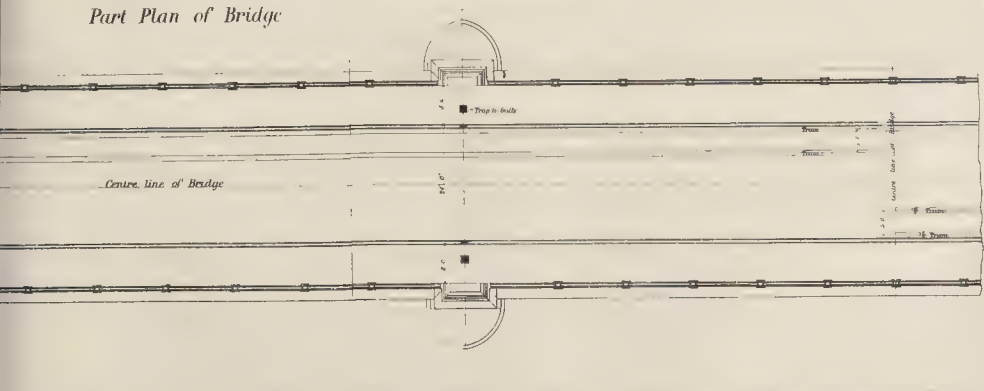


Contract Drawing N<sup>o</sup> 5.



Cross Sections at A to T  
Intermediate Spans see Drawings N<sup>o</sup> 17, 18 & 19.

Part Plan of Bridge







Illustrations.

NEW BATTERSEA BRIDGE.

WE give reproductions of a portion of the working drawings of the new Battersea Bridge, which was opened by Lord Rosebery on Monday last. The bridge, as will be seen, is, with the exception of the piers and buttments, an iron construction; it has been designed by Sir Joseph Bazalgette, C.B., the Engineer to the late Board of Works, in conjunction with Mr. E. Bazalgette, who has, we believe, been mainly concerned in the superintendence of its erection. The main details of the construction are shown and described on the drawings; the piers, it will be seen, have a concrete foundation within sheet piling, above which is brick with granite facing. The iron skewbacks are built into the brickwork and granite of the piers, the arched ribs bolted to them through tapered steel packings interposed above and below the centre line of the arch, which has play to turn on a concave seating. The skewbacks themselves are bolted by long 2 in. vertical holding-down bolts to a course of granite slabs extending right through the piers. The granite was supplied by the Kit Hill Granite Co.

The roadway is carried on a system of iron standards with cross bracing, forming with one arched rib a cantilever, and carrying a slab of concrete on which the pitching of the roadway is laid. The footways have an asphalt surface on a layer of concrete. A continuous iron pipe box of square section is laid down under the kerb of the footway.

The bridge, the cost of which has been £43,000, is an excellent piece of work constructionally, though it is much to be regretted that we have not had a monumental granite structure such as Putney Bridge, one of the best bridges on the river. This of course was a question of economy. If the economy had been carried a little further by the omission of the coarse and badly-designed cast-iron ornament (?) in the spandrels, it would have been better; but engineers apparently cannot be got to see that badly-designed ornament is a great deal worse than no ornament at all.

SCULPTURE: ROYAL ACADEMY EXHIBITION.

WE give this week illustrations of two from among the (as usual) numerous busts exhibited at the Royal Academy. That by Mr. G. A. Lawson, entitled "Old Marjorie," is a study of an aged woman's head. "While modelling it," says the sculptor, "it suggested to my mind the part of faithful old retainer one sometimes hears of, at once the pet and the autocrat in the same family for fifty years." The countenance well expresses this idea.

The bust by Mr. Woolner, R.A., is that of a distinguished South Australian, Sir Thomas Elder, who has taken a very important part in developing the riches of his country. He has reared vast herds of cattle and horses for agricultural purposes, and been a supporter of everything that tended to advance the civilisation of the colony, having amongst other acts of munificence contributed a fortune, it may almost be said, towards the establishment of the Adelaide University. Mr. Woolner has created the bust with characteristic and suitable simplicity of style.

WROUGHT-IRON PARK-GATES.

THESE gates are designed for an existing ornamental brick archway from the fore-court into a garden; the archway is also designed by the same architect. The gates are about 10 ft. 6 in. wide and 12 ft. 6 in. high; the main frame is 2 in. square, and the foliage in the gates is of thin plate hammered up. The gates are fitted with a fixed head.

They are being executed by Mr. Maides, of Islemere, one of those country blacksmiths who possesses the traditional skill of their craft. It was thought that, from his being of the county in which the gates are to be fixed, the workmanship might have a smack of the soil, and that the gates would be looked on with pride by the workmen and act as an incentive to the continuance of artistic skill in the blacksmiths of the locality.

The architect is Professor Aitchison, A.R.A., and the drawing from which the illustration is taken is exhibited at this year's Royal Academy Exhibition.

SHEFFIELD MUNICIPAL BUILDINGS COMPETITION.

WE publish this week the perspective view and plans of principal floors of the design submitted, in the final competition for the Sheffield Municipal Buildings, by Mr. F. H. Tulloch.

The plan, as will be seen, occupies the whole site, with a continuous corridor all round, and the Council-chamber at right angles with the main centre line of the plan, and the Accountant's General Office below it, reached from the two side corridors. The general arrangement of the plan considered *en bloc*, is very good; in detail, the offices seem rather too much mixed up; the committee rooms on opposite sides &c.; and the Town Clerk, though central in one sense, is at a centre rather too distant from the central field of operation.

The arrangement and use of the Mayor's parlour has evidently been very differently regarded by different competitors, and the instructions do not indicate with sufficient precision whether it was to be regarded as a private sitting-room or a state room. It should in our opinion, combine a certain degree of state with retirement and comfort, and hence we hardly think the central position between the reception-room and the dining-room is the ideal one for it. It then becomes a room with three large doors, one in each side of it; not the most comfortable kind of room to sit in; and the architect provides the Mayor with a small sitting-room with lavatory accommodation (which the Mayor's parlour has not), close to one of the Council-room entrances. But in that case it is not easy to see what is the function of the Mayor's parlour; it is too large for a sitting-room, and too small for a state reception-room, which is already provided for; and when guests are received for a large dinner, which would necessarily be in the reception-room, they would have to cross the Mayor's parlour to arrive in the dining-room. Various competitors adopted this arrangement, the right or wrong of which of course depends to some extent on each designer's view of the way in which these state apartments were to be used. The general arrangement of the lavatories in this plan appears very good.

We append as a further explanation of the scheme, the greater portion of the report which accompanied the plans, omitting (for the sake of space) some minor details.

"The principal entrance is placed in the centre of the block facing Pinstone-street, and leads to a spacious entrance hall from which is approached the main corridors and the grand staircase.

The Council-chamber is placed on the principal floor in the centre of the site, and is quite isolated from all noise arising in the surrounding street. It is approached by the grand staircase, and also by the north corridor; it has a commodious ante-room, and the cloak-rooms are conveniently adjacent thereto. A gallery for the use of the public is provided at the north end of the chamber, and is approached by a staircase leading from Surrey-street; screen doors are placed across the corridor to prevent the public having access to the main building. The reporters have space allotted them on the floor of the Council-chamber. A small retiring room for the use of the Mayor is provided, having an entrance from the south side of the Council-chamber.

The reception-rooms are placed facing Pinstone-street, and being of large dimensions, entailing a corresponding magnitude in height, give an opportunity of dealing in a broad manner with the architecture of the main façade.

These rooms are approached by the grand staircase, and have, for the purpose of exit, a smaller staircase on the south side leading direct to the street. The cloak-rooms are placed in a mezzanine floor, and are conveniently arranged for the accommodation of guests before entering the reception-rooms; they are also conveniently placed near the Council-chamber. . . .

A serving-room is provided at the north end of the dining-hall, which is in direct communication with the kitchen, &c., on the second floor.

A platform is provided at the south end of the reception-hall, having an exit into a retiring room facing Cheney-row, which room is provided with a separate staircase leading to the half-way landing in the secondary staircase at the south end of the corridor.

One large committee-room and two sub-committee-rooms are placed facing Surrey-street, and the remaining two large committee-rooms and sub-committee-rooms are placed facing Cheney-row, all on the first floor.

There is provided a Mayor's small parlour for his private use, with lavatory and w.c. accommodation, in close proximity to the Council-chamber, reception halls, and Town Clerk's offices.

The whole of the reception-rooms, the Mayor's parlour, Council-chamber, grand staircase, and

committee-rooms, with the exception of those facing Cheney-row, can be cut off from the departmental offices as shown by screen doors across the corridors on the ground and first-floor plans.

The Town Clerk's offices are planned to occupy the end block facing Norfolk-street and a small portion of Cheney-row on the first floor, having easy access to the common staircase on the Surrey-street side. A staircase is provided in the octagonal turret in the general office for access to the store above.

The Borough Surveyor's offices are placed to the left of the principal entrance facing Pinstone-street and part of Surrey-street, on the ground-floor, having north light, with the exception of the Building Inspector's office which is placed in the basement; this office has communication, by a circular staircase, with the drawing-office above.

The Borough Accountant's offices are planned to occupy the building in the centre of the site on the ground-floor and basement, the rooms in basement having direct communication with the general office above.

The offices of the Health Department occupy the rooms on the right of the principal entrance facing Pinstone-street, and a small portion of the Cheney-row front on the ground-floor, also on the first floor over those rooms, on the ground-floor facing Cheney-row, and in the basement, occupying nearly the whole of the Cheney-row front, each floor having direct communication one with the other.

The Sewerage and Rivers offices are placed to occupy the Norfolk-street front on the second floor, with the exception of the drawing-office, which has its whole length facing Surrey-street, thus obtaining north light, and having access to a common staircase, and being in direct communication with the offices of the Borough Surveyor.

The Weights and Measures offices are placed in the basement. . . .

The offices of the Waterworks Department occupy the whole of the block facing Norfolk-street, a portion of the Surrey-street and Cheney-row fronts on the ground-floor, the remainder being placed in the basement facing Norfolk-street and Surrey-street, with the exception of the Engineer's offices, which occupy a portion of the Surrey-street front on the first floor, as specified in the competitors' instructions.

*Lavatories and W.C.'s.*—There is provided an isolated block of buildings with sufficient lavatory and w.c. accommodation for the use of the several departments on each floor, being in a central position, and having thorough cross ventilation; there is also further provision of lavatory and w.c. accommodation in the centre block of buildings under the grand staircase on the ground-floor for the use of the different departments. . . .

For warming, there is provision made in the boiler-room in basement for No. 2, 24 ft. 0 in. by 6 ft. 0 in. Lancashire steam boilers, and laid on from the same a steam main traversing the course of the general corridor. From this main carry branch pipes to the positions occupied by coils on the various floors overhead, with vertical services having connections on each floor.

In the window backs of the various rooms or other suitable position, also in the entrance lobbies and the corridors, provide steam-heating "Radiators," and connect to the services before-named, and carry from each a condense pipe back to the boiler-room, taking the same course as the steam pipes.

In the Council-chamber, reception-rooms, and the grand staircase, it is proposed to have steam-heating battery chambers under the floor, and bring the heat from these chambers through gratings in the floor in suitable positions, or through panels in the dado at the sides of rooms.

For ventilation it is proposed to provide the necessary fresh air in ample quantities by means of a fresh-air inlet-grating through the outer wall at the back of each of the coils, when it would become warmed on entering the room; these inlets to be made to open or shut at pleasure. Similar fresh-air inlets to be provided to the batteries warming the Council-chamber, reception-rooms, and staircase. The removal of the vitiated air from the various rooms would be effected by means of extraction ducts carried up in the walls, and provided in each room with a self-acting valve to prevent back draught.

It is proposed to construct the whole of the building in the most approved fire-proof manner, the floors of the various offices being finished with wood block paving on asphalt bed.

The whole of the front elevation and the return elevations of the main building would be faced with stone from the Warwick quarries, Huddersfield, or from the Bolton Wood quarries near Bradford. One of these stones would also be used for the architectural dressings, such as quoins, stringers, cornices, window jambs, &c., to the remaining part of the building facing Surrey and Norfolk-streets and Cheney-row, the walls between being faced with hammer-dressed wall stones from the district.

The large courtyard would be faced with pressed facing bricks, the smaller courtyards or areas would be faced with white glazed bricks.

The roofs would be constructed of wood and iron and covered with Westmorland green slates. The floors of the reception-rooms, committee-

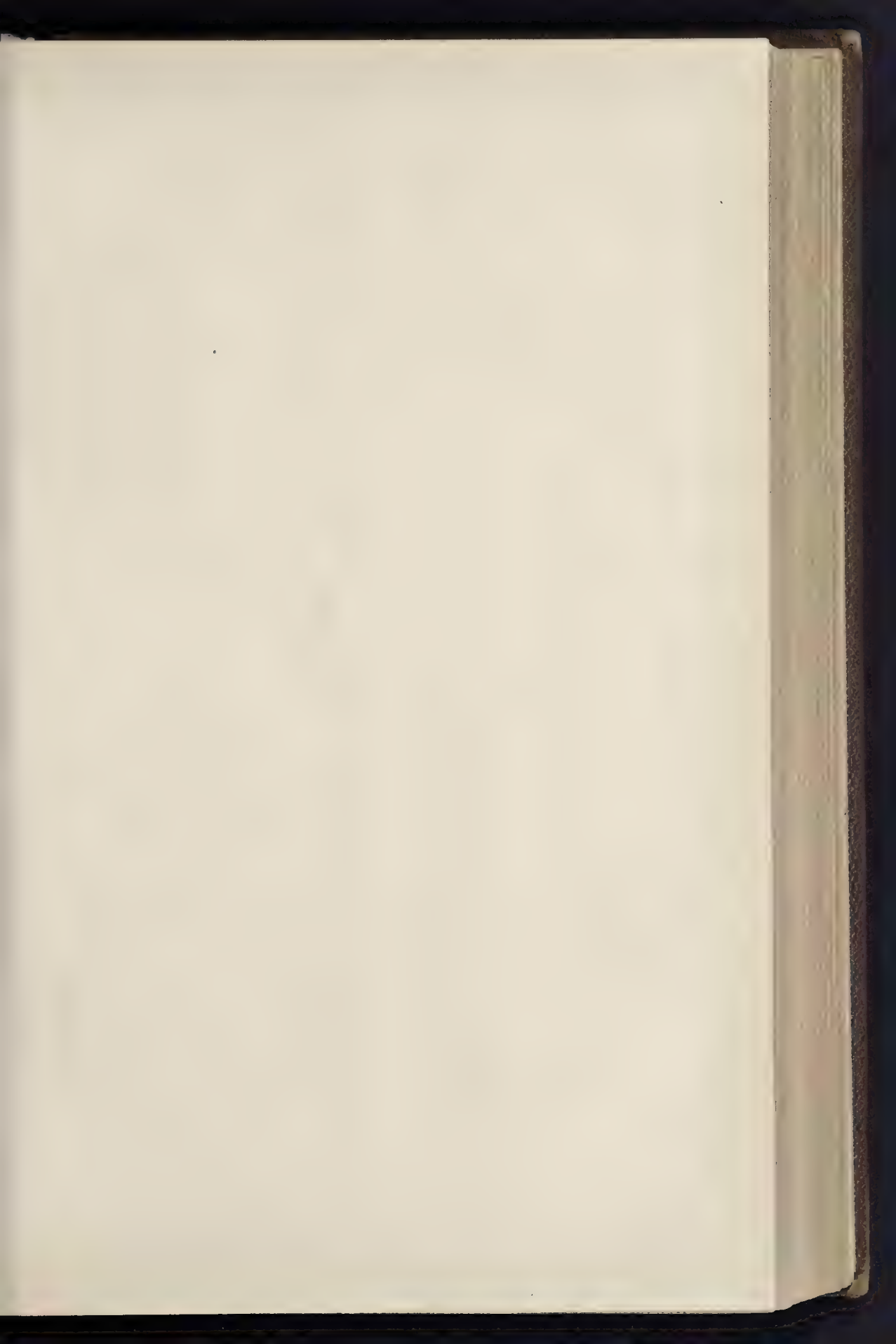
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Ground Floor Plan.

SHEFFIELD MUNICIPAL BUILDINGS: FINAL COMPETITION.—DESIGN SUBMITTED BY MR. F. H. TULLOCH

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SHEFFIELD MUNICIPAL BUILDINGS. FINAL C

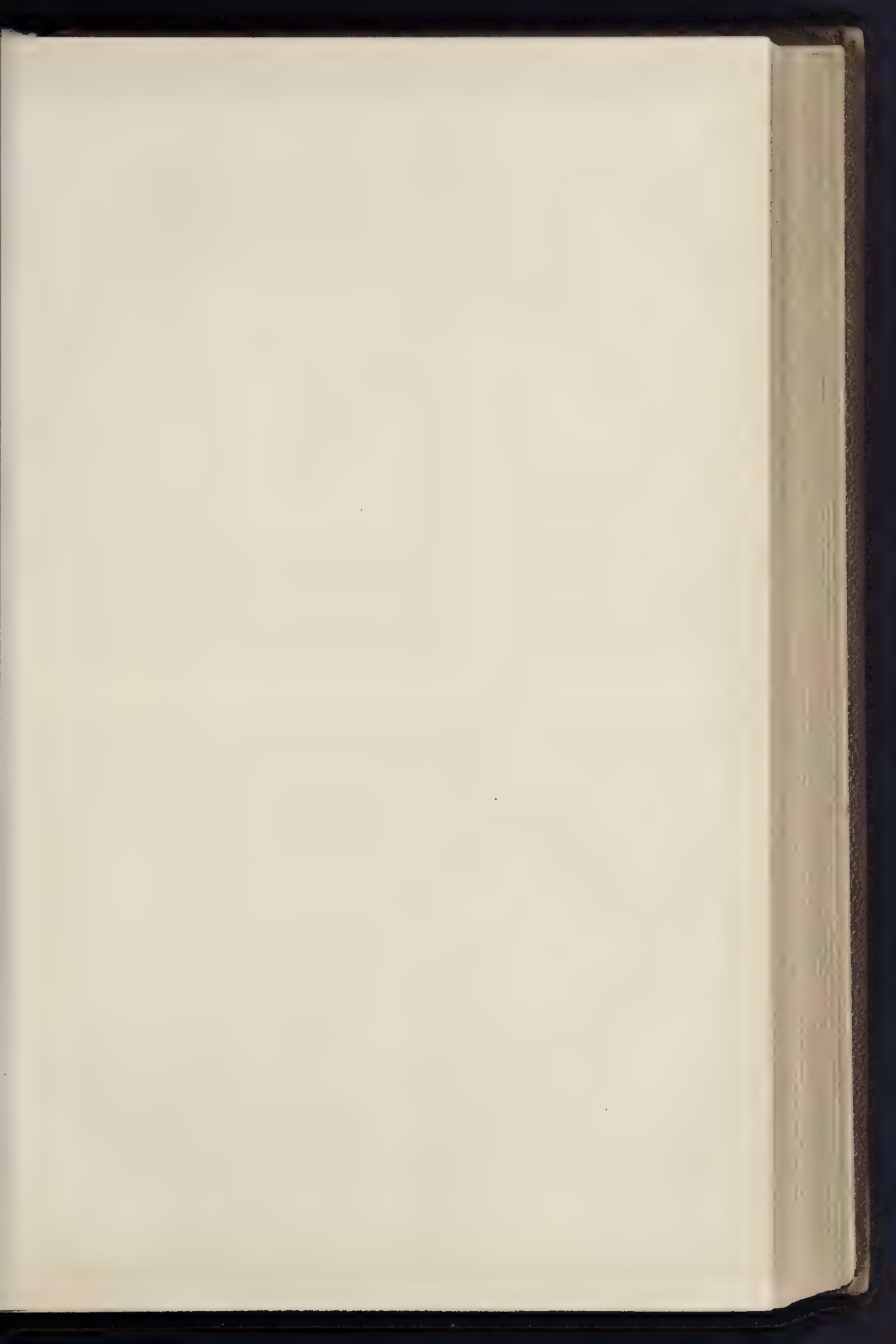




TION.—DESIGN SUBMITTED BY MR. F. H. FELLOCH.









"OLD MARJORIE."—MR. G. A. LAWSON, SCULPTOR.



SIR THOMAS RIDER, C.B., M.P., F.R.S.





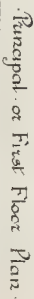
A PAIR OF PARK GATES

SCALE 0 6 0 1 2 3 4 5 6 7 FEET (in relief)

GAITCHISON & ARCHT







rooms, and Council-chamber would have solid hardwood parquetry laid on concrete with proper bed; the corridors generally would be paved with marble and other materials.

#### Summary of Estimates.

Main building .....	£70,612	0	0
Tower .....	2,244	0	0
Foundation below 382-0			
level in Norfolk-street ...	5,000	0	0
	£77,856	0	0

#### THE LONDON WATER QUESTION.

On the 11th inst., at the Local Government Board, Mr. Ritchie received a deputation from thirty-two out of the thirty-nine Vestries and District Boards in the metropolis in favour of legislating this Session upon the water-supply of London.

Mr. Ritchie, in reply, said that the question divided itself into two parts—first, whether some legislation should take place immediately with regard to the charges of the companies; secondly, whether there should be some immediate legislation with regard to the transfer of the water supply undertakings to some public body. The first proposal again divided itself into two heads—first, whether it was practicable, and, secondly, whether it would be just. With regard to its practicability, the Government had undertaken, with certain exceptions of a minor character, not to propose any fresh legislation of a contentious character this Session, and it would come upon the House with something like dismay if the leader of the House were to announce that before rising they were to dispose of the water question. It would be quite impossible now for the Government to give any facilities to Mr. Causton's Bill, unless it were taken up as a Government question. It had been said that the legislation proposed would not be contentious; but he could hardly conceive anything much more contentious or much more likely to create opposition than to attempt to take away, at the far end of a Session by an Act of Parliament, rights and privileges which, whether good or bad, had been conferred by statute. In 1885 Parliament passed a Bill which took away from the water companies the right which they then possessed of increasing their assessment, from time to time, within the periods of quinquennial revision. They were now approaching the first revaluation after the passing of that Act, and he would therefore suggest this consideration as being an added element of difficulty to the suggestion, that they were, on the first opportunity for the exercise of the rights which were practically agreed to by Parliament in 1885, to pass a Bill saying that the Companies should not exercise those rights. It had been said with great force that without any increased supply the right should not be given to make an increased charge. But he imagined that the effect upon the individual would be the same if the water-supply were transferred to a public authority, because the charge would be levied by means of a rate, and if a man's assessment rose, he would have to pay an additional sum, although he might not get a larger supply of water. What were the circumstances of the present day so far as the public were concerned, and with regard to the possibility, the probability, he hoped, of the matter being at some time transferred to a public body? He very greatly doubted whether the approaching revaluation of the metropolis would greatly benefit the water companies. There was a very much larger question involved in the proposal that the water should cease to be supplied by companies whose interests were mainly divided interests, and given to a public body whose interests would be the interests of the general community. The only satisfactory solution of this question was to transfer the water undertakings to a public authority. He thought that, having created in the metropolis a large and important body fully representing the whole of the ratepayers of the metropolis, the transfer of those powers to any other body would be attended with great difficulty. His own view lay distinctly in the direction of casting the responsibility upon the London County Council when the occasion arose. As they knew, an enormous sum of money was involved, but he hoped that would not stand in the way of a complete solution of the question. He was sure there was a strong feeling in the metropolis that the water-supply of London should, upon fair and equitable terms, be transferred to a body which was representative

of the ratepayers, and which should administer the undertakings transferred to them solely in the interests of the public. In expressing that feeling for himself he felt sure that he was also expressing it for his colleagues. The London County Council had this year received the sanction of the House of Commons to the devotion of a sum of money to an investigation into the question of the water-supply. The Corporation of the City was also, he believed, at its own expense, making investigation into the question. He assured the deputation that the Government would be prepared to give a full, careful, and he hoped a satisfactory, consideration to any suggestions, recommendations, and reports which might be made to them by those authorities.

At the sitting on the 18th inst. of the inquiry which is being made into the question by the Corporation of London,

The Chairman (Sir Guyer Hunter, M.P.) said it had been brought to his notice that there was a rumour that that Committee was indisposed to act in conjunction with the London County Council. He thought that the observations he made in opening the inquiry would have shown that they were disposed to act with the County Council in this important matter. He regretted to hear that this rumour existed, and he took the earliest opportunity afforded him of assuring the County Council that it was their wish and desire to co-operate with them in every matter connected with this inquiry, and he would be only too glad if the County Council would co-operate with them, in order to make the inquiry as brief as possible, and to bring it to a satisfactory conclusion. As to funds, enough money had been placed at the disposal of the Committee, and there was no necessity for any separate inquiry being conducted by any local body.

Mr. Archibald E. Dobbs was the first witness. In answer to the Chairman, he gave a summary of the various Acts under which the water companies supply their respective districts, and the arrangements under which they levy rates. The collection of the rates half-yearly in place of quarterly was a convenience to the consumer, but it placed an enormous additional power in the hands of the companies, for the ratepayer would have no redress if he had not tendered quarterly the amount actually legally due. If a ratepayer objected to a single item for some extra charge his supply would be cut off. The law on many points was not at all clear, and the capitalised value of charges made annually of which the legality was questionable, would amount to a very large sum. The law placed the companies in such a position that if the consumer made the slightest slip he was "done for." The companies had not strained their Acts, considering the enormous powers which had been placed in their hands by loose and haphazard legislation. The companies had done everything, by compromise and otherwise, to prevent questions being looked into. In the various Acts there was a great want of uniformity, and nobody could tell the true position of matters. If a consumer objected to an extra charge he was helpless, and would have to pay. The only prudent and wise course in case of a dispute was for the consumer to go on paying all his life rather than personally to dispute the charge, even although he knew that the charge was illegal. If the charge was for 10s it would cost him that amount for legal expenses in the initial stage, and he might have, if he lost, to pay his own and the company's whole expenses. If a water company made a charge which was disputed, the onus lay on the consumer of proving that they were wrong, there being no onus on the company to prove that they were right. Mr. Dobbs handed in the draft of a Bill, the details of which he did not desire to be made public, for the consideration of the committee. He thought that it would provide a fair settlement of the question, and would receive large support in Parliament. Being asked his views as to whom, in the event of the purchase of the water companies' undertakings, the control should be transferred, Mr. Dobbs said the actual administration and management of details would be better in the hands of a small body, who would use discretion in the carrying out of the Act of Parliament which would constitute the new arrangement, but that small body should be under a representative body, most probably the County Council and the Corporation. If the construction which the water companies placed upon their Acts was carried out to the hard and rigid

letter of the law, the consequences which would ensue were such as could never have been contemplated by any legislature of sane men. Mr. Dobbs further stated that the ratepayers seemed apathetic. In acknowledging the public contributions to the costs of his action against the Grand Junction Waterworks Company, he made an appeal for funds to have disputed questions legally tested, but a very poor response had been made.

Mr. John James Durrant, 40, Cheapside, stated that he paid for water-rates double what he paid fifteen years ago, although the supply had not increased.

Colonel Gouraud, the representative of Mr. Edison in this country, gave evidence as to the extraordinary variation between the amount of water-rates paid respectively for his offices in Northumberland-avenue and his house at Streatham.

Mr. Samuel Cook, from the firm of Messrs. Lass & Co., chartered accountants, gave details of the capital and profits of the water companies and of the present value of the shares as far as known. He stated that the nominal amount of the capital of the London water companies was, in 1871, 10,016,164*l.*, and the market value 14,475,096*l.*; while in 1890 the nominal capital was 14,432,733*l.*, and the market value 33,444,506*l.*

The committee then adjourned.

#### Correspondence.

To the Editor of THE BUILDER.

#### OLD CHURCH FREScoes.

SIR,—As many of your readers have been interested in the restoration of old churches, I, and doubtless many of your readers, would be glad if they would give us the benefit of their experience of the best mode of procedure to remove the superfluous coats of plaster and whitewash without injuring any frescoes underneath, and also state if there is any preparation to preserve them from fading away afterwards through exposure to sun and light.

My experience in Church restoration confirms my belief that most of our old churches should have their walls scrowled with colour, instead of the "restored" bare aspect they now wear, and that through want of knowledge and proper care many links of the past are lost for ever.

The fine church of Ewelme, near Wallingford, is an instance, its walls bearing indications of many frescoes under the coats of whitewash, and the interesting resting frescoes around the chancel of Chalgrove Church close by are fast fading away on the north side, where the Life of Our Lord is depicted, from exposure to sun, while those on the south side illustrative of the Life of the Virgin, are almost a clear as when uncovered in 1838.

MARSDON MOWERAY.  
48, Iliffe-road, Oxford, July 18, 1890.

#### FIRE-RESISTING WOOD.

SIR,—With respect to the letter of your correspondent in your last issue respecting the fire-resisting quality of jarrah, it would probably be interesting to those of your readers who require non-combustible timber to know that the newly-imported Madagascar Laloua wood is almost exceedingly difficult to burn.

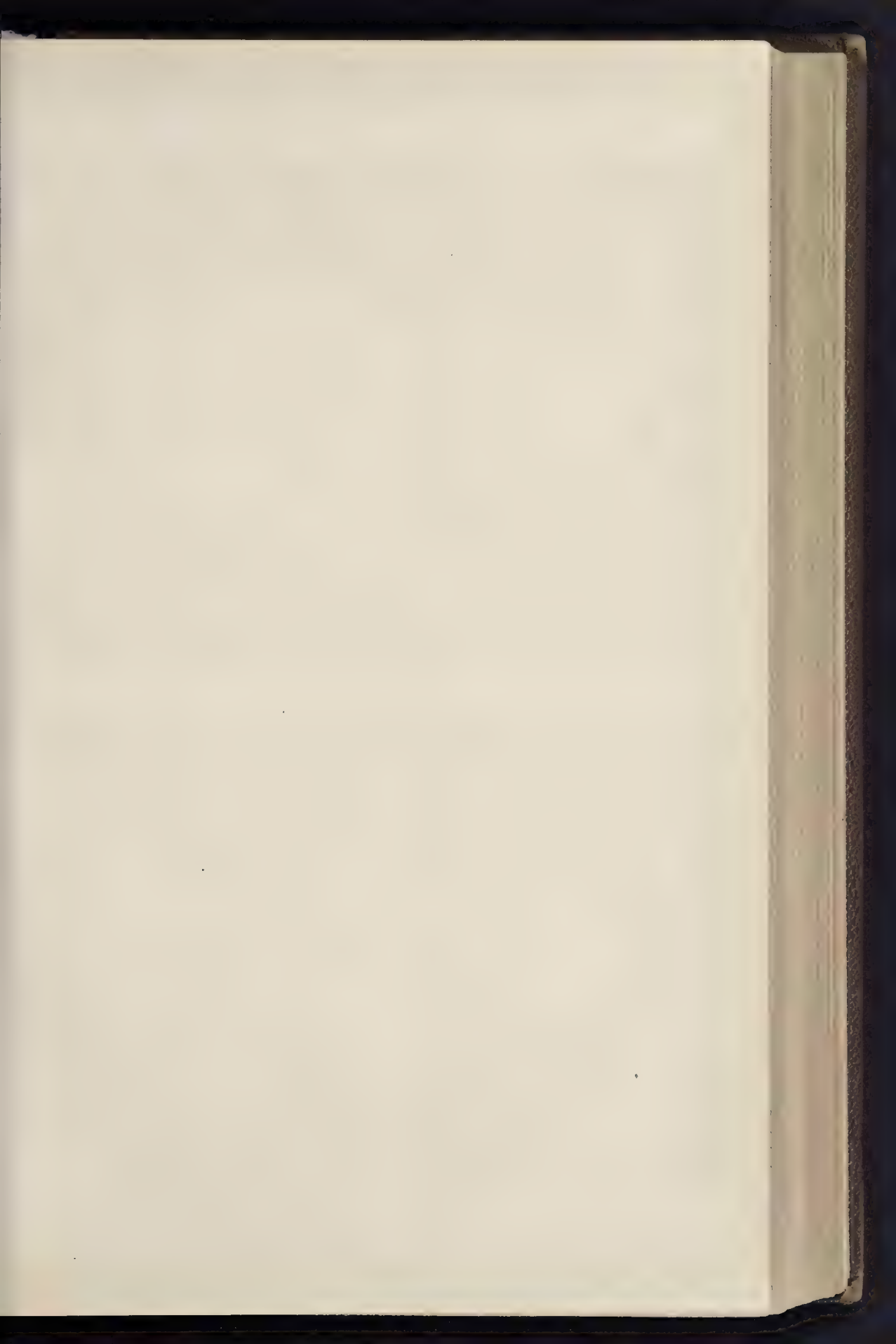
G. W. BUCHANAN.

SIR,—I am interested in the letter of your correspondent, Mr. Francis Bird, which appears in your number for the 19th inst. I quite agree with your recommendation of oak as a fire-resisting material. Some other kinds of wood also do very well, and I have in my possession a piece of timber used in the roof of Canterbury Cathedral, and which was in its place several centuries previously to the fire which occurred about twenty years ago; this timber has been subjected for a considerable time to a great heat, but is only charred on the surface; where seen through it is still so hard that a penknife will not cut it. It is a piece of chestnut.

J. C. MERRYWEATHER.

PLAYING-FIELDS FOR LONDON.—A meeting was held at the Mansion House on the 16th inst. in support of the movement for the further provision of playing-fields for London, and the improvement of existing ones. The movement originated at a meeting held in November last, presided over by Lord Aberdeen, an alderman of the Middlesex County Council, to make provision for the recreation of young artisans for somewhere where they could go and play at cricket and football, and which they desired besides the free libraries and mechanics' institutes already provided for them. Mr. V. E. Walker has already given 500*l.* and fifteen acres of land at New Southgate, which munificent donation has provided for their wants in that district.

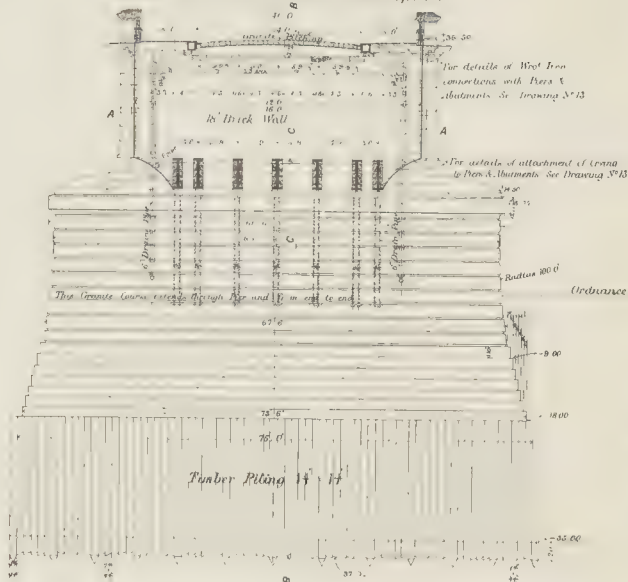




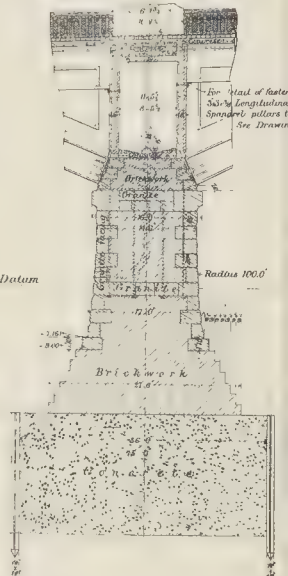
## BATTERSEA BRIDGE.

## Details of Piers.

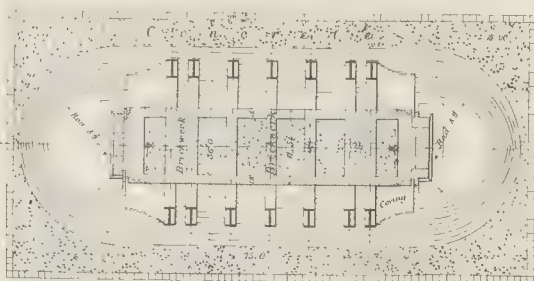
Side Elevation of Pier  
between Centre and Intermediate Spans



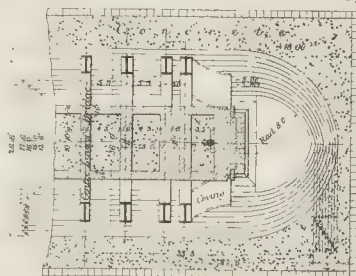
Section on line B.B.



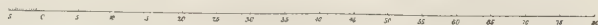
Sectional Plan on line A.A.



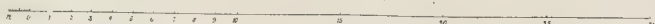
Sectional Plan of Pier  
between Intermediate and Shore Span



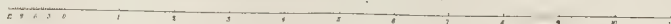
Scale to Side Elevation & Section, & Plans



Scale to End Elevations & Corresponding Sections



Scale to Details of Mouldings & Parapet



Section at F.F.  
Parapet, Footway & Concrete

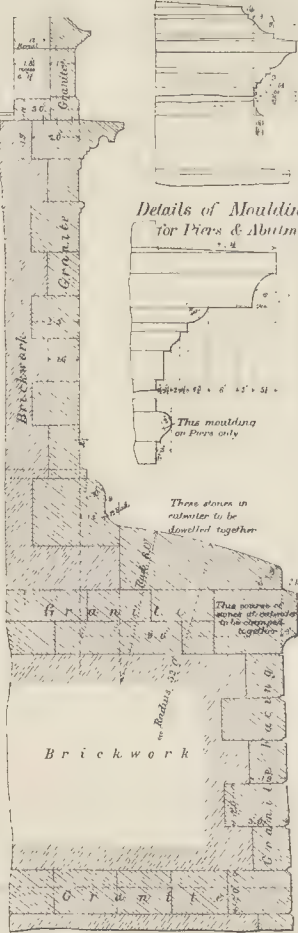
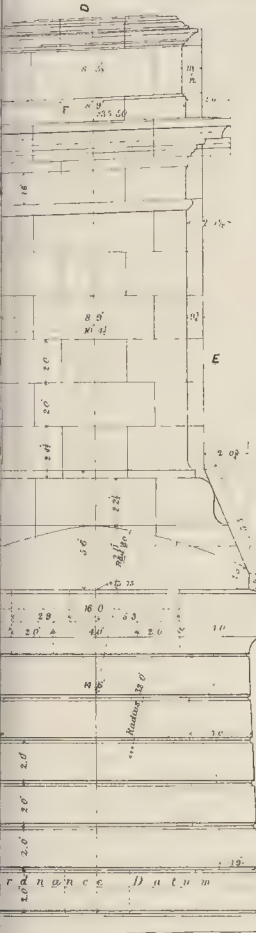




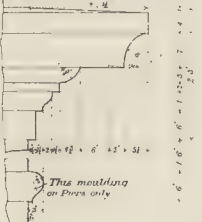
Contract Drawing N<sup>o</sup> 12.

End Elevation of Pier  
Centre and Intermediate Spans

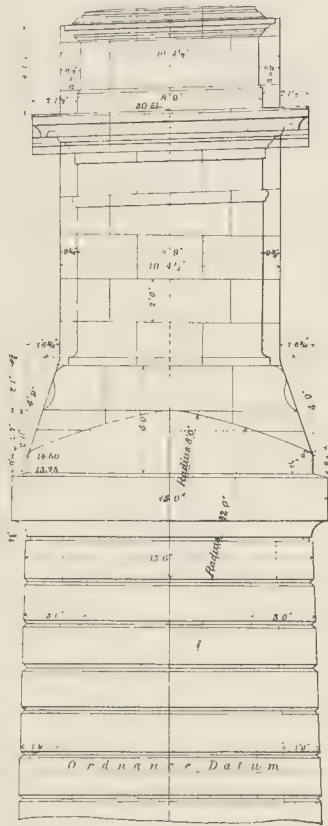
Section  
on line D.D.



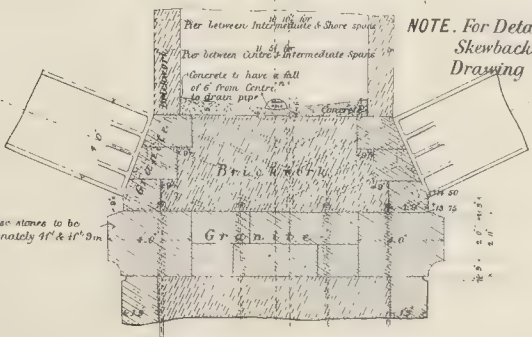
Details of Mouldings  
for Piers & Abutments



End Elevation of Pier  
between Intermediate & Shore Spans

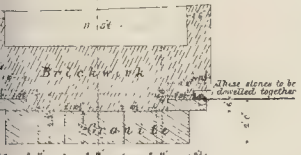


Section on line C.C.



NOTE. For Details of  
Skewbacks see  
Drawing N<sup>o</sup> 14.

Section on line E.E.







## The Student's Column.

## HOT-WATER SUPPLY—IV.

BOILERS: continued.

THE most efficacious way to add to the power of the saddle boiler, spoken of in the last paper, by increasing its heating surface, is to extend it up the back of the range, making it what is known as a "boot" boiler, fig. 6; nearly every make of range will

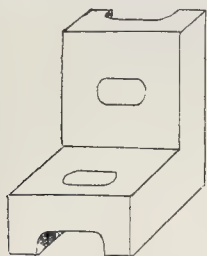


FIG. 6.

permit of this, and the boiler then becomes one of the most powerful that can be used, and such a boiler fitted into a six-foot range having a 14 in. fire will provide an abundant supply of hot water in a large residence with as many as twelve draw-off taps in regular use.

Another form of boiler to be occasionally met with similar to fig. 7, having a tube flue through

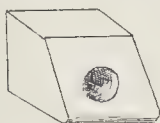


FIG. 7.

it, and when made "boot" shaped, the tube flue is sometimes continued up the leg portion. This shape has two obvious advantages over the so-called saddle boiler, the first being that the lower part of the flue is heating surface, which is not the case with a saddle, and the flue being raised up from the bottom of the fire prevents its being so frequently choked with ashes; but it is commonly considered that these advantages are outweighed by the disadvantage it has in being so difficult to clean out.

Of course, it is not an impossible task to clean out a boiler of this description, but it must be borne in mind that this work has to be entrusted to workmen who are no more perfect than those in other trades; and, although one man may give additional care to an awkward boiler in cleaning out the angles—the parts of the boiler needing most attention—another man may be equally careless, with the most unfortunate results.

There is an idea very prevalent that this cleaning process is a simple task that may be relegated to a labourer (fitter's assistant), but no greater mistake could be made; it is work on which an experienced man should always be sent, as particular care must be exercised in removing fur from those parts which are subject to the greatest heat, especially the angles where the welds or joints in the plate exist; and again, although a boiler is practically a box with an opening in the top, it is worth any one's while to insert their hand in a boiler when an opportunity occurs, to experience what a really awkward and difficult task it is to clean it out, remembering that the "fur" is usually hard like stone, and adhering to the boiler-plate. The trouble is greatly increased by many boilers being turned out with the inner edge of the manhole all rough and jagged with the filaments of iron that always appear on one edge of a hole that has been drilled, and there could scarcely be found a single hot-water fitter who has not scars upon his arms from this cause.

There are numbers of people (not range-makers) who signify a preference for square boilers,—that is, boilers having a flat bottom

without any arched or tubular flue, but which have a flue put to them by being placed on fire-bricks, as fig. 8; the argument in favour of these being, firstly, that

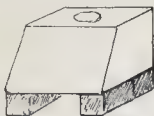


FIG. 8.

with an arched-flue boiler a weld or joint has necessarily to be made around the front edge of the arch, whereas in a square boiler a joint need not be there, as the bottom front angle can be formed by simply bending the plate; secondly, they contend that the narrow spaces on each side of the arched flue at the bottom of the boiler might quickly get solid with "fur"; these arguments are considered strong ones by those who use them, but it can be as strongly maintained, firstly, that although a weld does exist in an arched boiler where mentioned, it is not proper for the weld to be weaker than the solid plate; certainly boilers when "furied" occasionally open at the weld in question, but this is to an extent evidence of poor welding, as more than two-thirds of the fractures occur as at fig. 4 (page 33 ante), in which the crack is shown at right-angles to the weld, although close to it. Secondly, the narrow spaces referred to do not get furied so quickly as is commonly argued, and even if they did, a boiler has rarely, if ever, been known to crack there, and an argument in favour of these side water-spaces is that they add at least one-fourth to the available heating surface.

All boiler-makers recommend that boilers to be of good quality should be made of plate not less than  $\frac{1}{2}$  in. in thickness, and this is certainly a strength that can be used with confidence with the largest boilers for this purpose, including the Independent kind; but there is not the least doubt that boilers of  $\frac{3}{8}$  in., or even  $\frac{1}{2}$  in. plate, would do a deal of service, if not as much as the  $\frac{1}{2}$  in., for, as already explained, these boilers rarely fail from actual wear, and a  $\frac{1}{2}$  in. plate will fail almost as quickly as the thinner ones, if the failure is brought about by the fur. It is, however, not a desirable practice to use boilers of thin plate; the  $\frac{1}{2}$  in. is a serviceable and safe substance, and is (or should be) always used in the best quality of ranges.

The quality of the plate is of the greatest importance, but this unfortunately cannot be judged from inspection, not even by the experienced; good boilers are of the same appearance, and as rough as those of poor quality, and what might be ascertained from the colour or look of the metal is obviated by the makers coating the boilers with a preservative material, a kind of tar. A remedy for this can be suggested by recommending that such goods be only purchased from good and responsible firms.

No reliable rule can be made as to what sized or shaped boiler must be used to meet certain requirements, for in no two residences will the demand for hot water be found to be alike, and supposing the demand did not vary, the manner in which the fire is attended to in the kitchen varies greatly,—in fact, the quantity of hot water depends to a very considerable extent upon the amount of cooking done, as it is only when cooking operations are in full swing that the fire is assiduously attended to. It is, however, with every confidence that the "boot" shaped boilers can be recommended; they are decidedly powerful, and although costing more than the saddle shape, they undoubtedly save their extra cost in the end, as they work so economically, and a given quantity of fuel will heat double the quantity of water with the former than the latter; or, in other words, a certain quantity of water will be heated with half the fuel in half the time. Of course, this more expensive shape and size of boiler cannot well be specified for small—i.e., 40L and 50L,—property, but where circumstances permit, the boot boiler will well repay the outlay.

Copper boilers, as already explained, are used in a very limited way in the south of England; not but what they are far superior to iron in many respects; but for the reason that there is no particular necessity for them, as the chalk in southern waters prevents the rust nuisance so keenly felt in the soft-water districts.

One superiority possessed by copper boilers is that this metal being a much better conductor of heat than iron, quicker results are obtained; a second is that the material is of a much more lasting nature, either from the effects of heat or of moisture; but the most peculiar and beneficial result obtained is that the "fur" trouble is, to a great extent, overcome.

It is noticed that copper boilers rarely have the deposit incrustated to any extent upon their inner surfaces, it being found lying loose in the bottom of the boiler in flakes or scales; many causes have been assigned for this, but there is no doubt that the comparatively great expansibility of copper when subjected to heat, and the corresponding great contraction upon cooling, has brought about this effect, as the incrustated fur has these properties to but a very trifling extent, and the result is the same as would be obtained by covering an elastic substance with a coating of a brittle compound. Of course, copper does not in the least prevent the lime precipitation taking place with hard water, and consequently the precipitated matter, whether fast or loose, has to be periodically removed. The nature of copper is also such that supposing the fur adhered to it as it does in iron boilers, the plates would not become fractured nearly so quickly; in fact, it would be difficult to do copper any great injury by the heat generated in a kitchen-range fire.

Copper boilers are much more costly than iron; the price is constantly fluctuating, but they commonly cost from four to five times as much as iron of good quality, but it should be borne in mind that a copper boiler, when its longest life of service has expired, is still valuable, whereas an iron boiler when unfit for use is quite valueless.

These boilers are usually made of  $\frac{1}{4}$  inch or  $\frac{3}{8}$  inch plate, excepting the front which should be thickened to  $\frac{3}{8}$  inch or  $\frac{1}{2}$  inch, not so much to withstand the action of the fire as to bear misdirected blows of the poker, as copper is soft and rather easily penetrated; often a slab of cast iron is made to place in front of the boiler, this slab being of exactly the same shape as the boiler front, with the arched flue way at the bottom.

## OBITUARY.

MR. JOHN WRAY, C.E., Borough Surveyor of Enniskillen, died at his residence, Darling-street, Enniskillen, on the 19th inst. The deceased gentleman has held the position of Borough Surveyor and Engineer to the Commissioners of Enniskillen for over eighteen years, and has also been for nearly forty years Assistant County Surveyor of Fermanagh. He carried out the works for bringing the Ballydoonagh water to Enniskillen, and during the drainage and navigation of the River Erin Mr. Wray rendered valuable assistance to the Drainage Board.

MR. DAVID DAVIES.—On Sunday afternoon, Mr. David Davies, well known throughout Wales, died at Llandinam, Montgomeryshire, after a long illness, in his seventy-second year. Deceased, who started life as a sawyer, represented Cardiganshire in the Liberal interest from 1880 to 1885. He was a well-known railway contractor, having constructed several Welsh railways, and was a founder and the largest shareholder in the Ocean Steam Collieries, Rhondda Valley, and Barry Dock, near Cardiff.

## GENERAL BUILDING NEWS.

NEW BANK AT THAME.—The new premises in Thame for the Bucks and Oxon Union Bank have now been completed. Mr. C. P. Ayres, of Watford, is the architect, and the contractor was Mr. Kingerlee, of Oxford. Mr. Rogers being clerk of the works, and Mr. Maycock foreman of works.

PROPOSED TOWN-HALL IN NEWCASTLE-ON-TYNE.—Mr. J. J. Fenwick writes to the *Newcastle Chronicle* calling attention to a suggested site and plan for the New Town Hall, including new street, running from Grainger-street to Barras-bridge, according to plans by Mr. Knowles, architect, Grainger-street. Mr. Fenwick characterises this as "the most feasible, bold, and comprehensive scheme put before the public."

NEW THEATRE FOR IPSWICH.—The foundation-stone of the new theatre was laid by Mr. Edward Terry on the 24th inst. The whole of the constructive work of the theatre is being executed in steel, Mr. Emden (the architect) hoping by the lightness to be obtained by a steel construction to improve the sight and sound in the building.

COUNTY BUILDINGS FOR SURREY.—The Surrey County Council, sitting at Newington last week, approved plans for the new County Buildings to be erected at Kingston for the transaction of County Council and Quarter Sessions business, the Surveyor's estimate of the cost being approximately 35,400l.



**THE BUILDERS' ACCIDENT INSURANCE, LIMITED.**  
—The ninth ordinary general meeting of the above-named Company was held at the offices, 31 and 32, Bedford-street, Strand, on the 22nd inst. Mr. Stanley G. Bird presided. The minutes of July 9, 1889, were read and confirmed. The Secretary (Mr. E. S. Henshaw) read the report and accounts for the year ending May 31, 1890. The report was as follows:—

"1. In presenting their ninth annual report the Directors are pleased to be able to state that in consequence of an additional number of insurers, coupled with the improvement in the building trade, the premium income of the Company amounts to £9,047, being an increase of £606 over last year, the largest sum yet received in any one year.

"2. Notwithstanding this increase in the premiums, the Directors regret that they have had to pay in claims a considerably larger sum than in any previous year.

"3. The Directors are of opinion that this result is mainly due to the serious nature of some of the accidents with which they have had to deal, especially in class 3, which is not provided for under the Act, and is generally known to the members as the 'public' risk.

"4. The Directors after careful consideration of the result of the year's working have come to the conclusion that it is not profitable, or just to the insurers under the Employers' Liability Act, that the premium on the public risk should remain at the present rate of 1s. per 100, at which it was fixed experimentally in 1885, but which experience has proved to be inadequate.

"5. The Directors have therefore with reluctance, but with a full sense of the responsibility which rests upon them, decided to increase the 'public' risk premium from 1s. to 2s. per 100.

"6. It will be for members in general meeting to vote such sum to the Directors for their services during the past year as they may think fit.

"7. In accordance with the Articles of Association the following Directors retire, viz.:—Messrs. G. Bird, H. H. Bartlett, J. Bradney, W. H. Cowlin, J. M. Burt, and T. F. Rider, all of whom are eligible and offer themselves for re-election.

**STANLEY G. BIRD, Chairman.**  
The report and accounts, as presented to the meeting, were adopted unanimously, and the following Directors, Messrs. Stanley G. Bird, H. H. Bartlett, J. Bradney, W. H. Cowlin, J. M. Burt, and T. F. Rider, who retired from the Board in accordance with the articles of association, were re-elected. The usual formal resolutions having been passed the meeting terminated with a vote of thanks to Mr. Stanley G. Bird for his services as Chairman during the past year, and for presiding at the meeting.

**DERBYSHIRE INFIRMARY.**—A special report has been made on the condition of this building, which it is proposed to enlarge, by Mr. Rogers Field and Sir Douglas Galton (acting separately), in addition to the report of the architects called in, Messrs. Young & Hall. All the reports concur in recommending that the hospital, except the "Nightingale Wing," is not in a condition to be worth adding to, and that it should be rebuilt on new lines. The following extract from Mr. Field's report gives sufficient indication of the necessity for the course recommended:—"The drains at present in use pass, to a large extent, underneath the buildings, and where they are outside they run about in a most complicated way, and are constructed in a very improper manner. In addition to this there are a large number of old drains underneath the buildings, remnants of a former system of drainage which has never been removed. Fever Ward numerous channels by which the foul air from the bad drainage can permeate over the whole of the building. In the first place there is a complicated system of ventilating flues, between which and the drains there is some connexion, as shown by the experiments carried out by Dr. Seaton. In the next place there are numerous holes through the walls where pipes pass; then there are rats running all over the building; and, lastly, I am informed that the walls themselves of the old building have been found to be hollow inside where they have been cut into. The water supply formation which was given me, the whole of the drinking water for all the buildings comes from a large cistern in the tower at the south end of the fever ward. Through this tower, close to the cistern, pass the extract ventilating flues which take the foul air from the fever ward, and these flues, which are only constructed of lat and plaster, are defective in many cases, so that the foul air can escape from them and contaminate the water in the cistern. The above is the briefest possible outline of the results of my inspection, but, although this inspection was necessarily a very rapid one, I saw enough to convince me that the defects are so serious that nothing short of entire reconstruction of the drainage will suffice to put the building into a safe sanitary condition, so far as the drainage is concerned."

**NEW BATHS FOR BRIGHTON.**—The foundation-stones of the new baths for Brighton, which are to be erected in Great Clowes-street, were laid on Tuesday by Alderman W. H. Bailey. The baths are to be built from the design of Messrs. Magnall & Littlewoods, of Manchester. The principal contractors are Messrs. R. Neill & Sons, of Strangeways, and the total cost will be £7,601. The baths provide for a first-class swimming bath 69 ft. by 43 ft., with a water area of 60 ft. by 25 ft.; and a second-class swimming bath 97 ft. 6 in. by 46 ft., with a water area of 75 ft. by 25 ft.

**NEWTON FLOTTMAN CHURCH, NORFOLK.**—This church, dedicated to St. Mary the Virgin, which, as stated in the diocesan records, was entirely rebuilt in the year 1385, and which consisted of nave, chancel, south porch, and square tower with one bell, was re-opened, in perfect weather, on the 16th inst., after restoration under the direction of Mr. J. T. Lee, architect, London; the work having been carried out by Mr. C. W. Bullen, builder, Weybread, Haveresham. The work of restoration comprised, practically, a new roof, on the old lines, of oak, the old lead having been recast in the church; new stonework, &c., both to windows, walls, and chancel arch, were necessary; several windows replaced; the floor laid throughout with tiles and wood blocks; and the nave re-seated, the beautiful old poppyheads and other carving being adapted. The estimated cost, not including private gifts, amounted to about £700.

**HOTEL METROPOLE, BRIGHTON.**—This sumptuous hotel, the design for which, by Mr. Waterhouse, is one of the exhibits in the Architectural Room at the Royal Academy, was thrown open to a private view for a number of invited visitors on Saturday last. It has been built by Mr. Thos. Holloway, and furnished throughout by Messrs. Maple & Co. The materials used are red brick and terra-cotta. The Rowlands Castle red facings were selected by Mr. Waterhouse, and the bricks were manufactured by Mr. Bastin at the Rowlands Castle Brick Works, near Havant. No colouring matter was used, either in their manufacture or when in the building. The hotel is entered from the main road, through a port-cochere leading to the outer hall, which has been panelled with oak, and an encaustic pavement in dull Asiatic red above, and an encaustic pavement in the same colour below. The inner hall is fitted as a lounge, and on the left are the passenger-lifts, fitted in Moorish style, and provided with the electric light. On the right of the hall are the three public dining-rooms, containing a series of rooms extending from the sea on the south side to the Italian garden and tennis lawn on the north, and capable of seating upwards of 500 guests at one time. The decorations of these rooms graduate from a warm rich golden brown to ivory white, while the curtains are of a silken material in similar tones. The walls are decorated with a golden brown material modelled in high relief. On the left or west side of the hall is the drawing room, richly decorated, and further adorned with pictures by Mr. Albert Kingsley, representing Sussex Ancestral Homes. The marble chimney-piece is from the chisel of Prince Victor of Hohenzollern. The building includes also a library, a very richly-decorated smoking-room with a sumptuous ingle-nook fireplace in oak, Turkish and other baths, and a special suite of rooms known as the "Clarence Suite," intended for banquets, wedding breakfasts, &c. The grand staircase is of polished marble.

The whole of the floors are of freestone construction. A state suite of rooms is provided in the centre of the building, including a reception room, dining-room and bedrooms. The heating and ventilation have been carried out by Messrs. Roser & Russell, on their system of ventilating radiators heated by steam power at 20 lbs. pressure, fresh air being brought in and warmed before admission to the rooms. The two grand staircases, the warmed by powerful batteries of steam-heated tubes, the structural ironwork is by Messrs. Handyside; the plumbing and sanitary work by Mr. George Jennings; the zinc work to dormers, roofs, copper to turrets, &c., ventilation and exhaust tubes and cowls, &c., by Messrs. F. Baly & Co.; the mosaic floors, &c., by Messrs. B. & S. Taylor; the ironwork to ball and stairs by Messrs. Farmer & Brindley; the terra-cotta to south front by the Burmantofts Co.; that to annex and north front by Messrs. Clift & Son; that to light cots and Clarence-rooms by Messrs. Gibbs & Canning; the whole of the cement floors throughout building, also paving to garden, &c., by the Granolithic Co.; the ironwork to balconies, porte-cochère, wrought-iron grilles, handrails and balusters to principal staircases, &c., by Messrs. Hart, Son, Peard, & Co.; the ornamental and stained glass by Messrs. Campbell & Smith and Clayton & Bell; the wall tiling to sanitary blocks, &c., by Messrs. Simpson & Son; the marble treads to principal and annex staircases, &c., by Messrs. W. D. Bennett; the wrought-iron casements by Messrs. Richardson, Ellison, & Co.; and the passenger luggage and service lifts by Messrs. Waygood & Co.

**THE AUCTIONEERS' INSTITUTE.**—A special Council meeting was held at the offices of this Institute in London on Friday last, when Mr. George Brinsley, of 30 and 31, New Bridge-street, E.C., who has been a member of the Council for several years, was unanimously elected President; the Vice-Presidents, Messrs. B. M. Bradbeer, J. Catling, F. Everill, and W. Weatherhead were re-elected, and twelve new applicants were admitted to membership.

**NATIONAL ART COMPETITION.**—The exhibition of the works submitted for the National Art Competition, 1890, by the Schools of Art throughout the kingdom will be opened to the public on Monday next, the 28th inst., and will remain open by until the 1st of August. The works will be on view in the Enamels Gallery of the South Kensington Museum.

## SANITARY AND ENGINEERING NEWS.

**ROAD MAKING.**—The Executive Council of the Inventors' Institute recently invited engineers and road surveyors in Great Britain to hear a paper read on this subject by Mr. D. Nicoll, Assoc. Inst. C.E. The lecturer referred to the recommendations of Sir Robert Rawlinson in respect to the construction of roadways, which he had largely followed, and the method pursued by the late Mr. Gordon at Leicester; it had answered admirably, and was the best roadway at present to be found. This system had to a great extent been his (the lecturer's) model; what disadvantages it presented he has entirely overcome, the following being an epitome of the perfected method:—Blocks of granite (5 in. by 3 in.) are wrapped, except on the upper surface, with waste fibre and an elastic bituminous compound, and the whole brought together in a homogeneous condition while resting on a continuous pad formed of the same substance. This continuous pad or slab is taken to the ground, and unrolled over the usual surface of concrete, the blocks are then placed diagonally, and by a powerful lever made to join together as above mentioned, the effect being that a horsehoe finds immediate resistance for stopping or starting a vehicle. There is comparatively neither noise, mud nor dust, and last, but not least, great economy. The surface being non-absorbent, it is easily cleaned by an ordinary water-cart. After some discussion, the meeting passed a resolution to the effect that Mr. Nicoll's system of paving was worthy of serious trial on an extended scale.

**ACTION OF MOORLAND WATER ON LEAD PIPES.**—In a paper recently read by Dr. John Brown, of Raup, before the Society of Medical Officers of Health, on "The Plumbo-Solvent Action of Moorland Water," the author gave it as his opinion that the solution of lead was due to the presence of an acid, not sulphuric as he originally believed, but an organic acid. Dr. Brown suggested, as the result of his experiments, that lead-poisoning might be prevented by the adoption of one of the three following methods:—(i.) Filtration through properly constructed beds of sand or rough sand rock. (ii.) Sticking the reservoirs with fish, as the latter use up oxygen and give off carbonic acid. (iii.) By treating the water with chemicals, especially carbonates of lime or bicarbonate of soda.—*Science and Art.*

**IMPROVEMENTS AT LEICESTER.**—A Local Government Board inquiry was held on Friday, the 11th inst., at North Kensington, Leicester, before Colonel J. O. Hasted, R.E., in reference to an application made by the Billesdon Union Rural Sanitary Authority for sanction to borrow the sum of £2,500, for works of private street improvement. Mr. William F. Ault, Surveyor to the Board, produced plans, and gave evidence in support of the application. There was no opposition. The same authority have recently received sanction to borrow £987, for private street improvement in the new Humblestone district, from plans prepared by the Surveyor.

**MOLD SEWERAGE.**—Mr. W. H. Radford, C.E., of Nottingham, has been requested by the Mold Local Board to prepare a scheme for the sewage disposal of the whole town of Mold, and for the sewerage of a portion of it.

**DRAINAGE DISPUTE AT MORECAMBE.**—Following an inquiry by General C. Carey, R.E., the Local Government Board report:—"The Board observe from the report that West Morecambe is being rapidly developed for building purposes, and that the present sewerage outfalls, which, it appears, have been constructed by private individuals and companies, are inadequate for the proper conveyance of the sewage of the district, and are encroachments on the foreshore not recognised by the Duchy of Lancaster. The Board, therefore, draw the attention of the Morecambe Local Board to Section 15 of the Public Health Act, 1870, which provides that 'Every Local Authority shall cause to be made such sewers as may be necessary for effectually draining their district for the purposes of this Act.' The Board are satisfied, from the evidence before them, that it is the duty of the Local Board to construct a main outfall sewer for the district of West Morecambe without further delay, and independently of any direct contributions from the owners of the properties which will be benefited by the construction of the sewer.' The Board also request that they may be informed at an early date of the course which the Local Board propose to adopt in the matter.—*Leeds Mercury.*

## STAINED GLASS AND DECORATION.

**CHURCH OF S. PETER-LE-POER, OLD BROAD-STREET.**—The decorative works now in progress at the Church of S. Peter-le-Poer, Old Broad-street, are being executed by Messrs. Pitman & Son, of Newgate-street. The works are under the direction of Messrs. Arthur & Ernest Billing, of Bank-chambers, Tooley-street, S.W.

**THE GERMAN CHURCH, BRADFORD.**—The three-light window at the east end of the German Church in Bradford has been filled with stained glass. The work, which represents the Ascension of Our Lord, is from the studio of Messrs. Powell Bros., of Park-square, Leeds.



## FOREIGN AND COLONIAL.

FRANCE.—A fine art exhibition is announced to be held at Dinan from August 15 to September 15, and an exhibition of painting at Boulogne from August 10 to September 15. Last week the inhabitants of Plombières, in the Vosges, gave a fête to their townsman François, the landscape-painter, in honour of his having obtained the Medal of Honour at this year's Salon.—The monumental fountain designed by M. Bartholdi, and which was restored on the occasion of the Paris Exhibition of 1889, has been purchased for 100,000 francs for the town of Lyons.

At Lyons also a new bridge has been opened, the Pont Moraud, to replace the old wooden bridge built in 1774. The new bridge is a stone one.—On the 7th, at Orleans, the new galleries of the History Museum, founded in 1855 by the Abbé Desnoyers were opened. The founder, now aged 84, died on the occasion the Cross of the Legion of Honour.—At Rennes a competition has been opened for the erection of a bronze statue to Leperdit, a former mayor and benefactor of the town.—At Fougères a competition has been set on foot for a memorial statue in bronze to General Lariboisière.—On the 14th, at Paris, the statue of Paul Bert was unveiled at Hanoi.—At Aix-le-Bains the competition opened for the Church of the Assumption has been decided. The first premium was awarded to M. Arthur Bortin, of Chambéry, the second to M. Joseph Aïx, of Lyons.—The Rue de la Grosse Horloge at Rouen is to be shortly completed. This is one of the oldest monuments of Rouen, dating from 1389.—M. Georges Rolland has officially demanded from the French Government the concession of the projected Sahara railway.—At Pantin the decorative paintings executed by M. Schommer for the Salle des Fêtes of the new Hotel have just been completed.

BERLIN.—In connection with the great "Bundesfest," a series of national and partly international shooting competition and popular patriotic fête held at Berlin last week, we again found a group of interesting temporary buildings erected. The main feature of the group is the large banquet-hall on the "fête ground," measuring some 500 ft. in length and over 100 ft. in width, in which 5,000 residents were able to dine together at one and the same time. In this erection, which has been built entirely of wood, the open timber roof is specially worthy of notice; in fact, the whole construction has been very cleverly worked out. The grand historical procession which passed through the town on the opening day of the meeting was a great success, the artistic part being extremely well treated.

THE OTIS ELECTRIC ELEVATOR.—An electric elevator has just been placed on the market by Otis Bros. & Co., of New York City, which is said to be well suited to many places where it has heretofore been impracticable to use such an apparatus. The winding machinery and safety appliances are such as they have been using for many years, but the motor, of which Rudolph Eickmeyer, of Yonkers, N.Y., is the inventor, possesses many novel features and was specially designed for elevator service. Among the advantages claimed for electric power generally, and for this motor in particular, are its safety, simplicity, efficiency, the absence of noise, and the fact that it is not troubled from liability to damage by frost or by careless manipulation. The elevator is described and illustrated in the New York Engineering and Building Record for July 5.

PROPOSED RAILWAY TUNNEL BETWEEN BROOKLYN AND NEW YORK.—Mr. Austin Corbin, President of the Philadelphia and Reading Railroad, has resigned that position with the intention, according to the New York Times, of promoting a scheme for connecting the Long Island Railroad system with New York by a tunnel under the East River from Atlantic Avenue, in Brooklyn, to the foot of Whitehall-street, New York. This tunnel, together with the proposed railroad tunnel from Hunter's Point, would, if constructed, permit of close connections between the Long Island Railroad and the great trunk lines, and such connections would be very advantageous in the event of the establishment of an American steamship line from the end of Long Island to Milford Haven, in Wales.

CABLE TRACTION FOR NEW YORK TRAMWAYS.—The New York Times for July 24 reports that the Third Avenue Railroad Company is determined to substitute a cable for horses on its road as soon as possible. It has been decided to use the duplex cable system, such as is now in use on the Harlem cable road. The directors are stated to have decided on a plan of varying rates of speed on the different parts of their cable road, from which they expect great traffic. Owing to the constant interruptions to traffic on the lower end of the road—through the Bowery and old Chatham-street—the cable in that section will be run at a comparatively slow rate of speed. In the next section above the cable will be run somewhat faster, and in the up-town section, where the road is generally clear, the expected great traffic will be reached. The central power station will be at Third Avenue and Sixty-fifth-street, where the present stables are, and there will be two other power stations.

STEAM-HEATING IN NEW YORK.—No doubt it is very convenient to have steam for warming or power purposes laid on to one's house or place of business from street mains, just as water, gas, and electricity are laid on; but judging from one or two paragraphs in the New York Herald of June 27 there are certain inconveniences to be reckoned with. Referring to the recent Broadway explosions, the Herald says, "The Commissioner (Gilroy) was before the Grand Jury yesterday, and it is said he was called as a witness to give testimony as to whether the New York Steam-Heating Company was maintaining a nuisance in conducting a business that causes volcanic eruptions on the city's busiest thoroughfare." On the other hand, the Company announces (and the announcement is ironically described by the Herald as "pleasant news for the owners of property in the lower section of Broadway and adjacent streets, surely") that the supply of steam "will be continued without interruption, night and day, as regularly in the future as in the past history of the company." In this connection some statistics are given by the company, showing that various numbers of persons have been killed by horse-cars, waggons, gas and electric currents, but none by the steam-heating company, "and absolutely no one injured in the eight years that the company has been in operation in the streets of the city." The Herald some days previously published a graphic description of the explosion, and of the columns of fire which shot up from the surface of the road, and gave the following explanation of the "eruptions":—"The pipes of both of the gas companies are made of cast iron, and the joints are made fast with lead. When the heat of the steam pipes reached the joints the lead promptly melted, away and allowed the gas to escape. If the pipes were made of wrought iron and screwed into each other such an explosion as is described above could never have happened." Since this was written, it is stated that Mr. Wilson, President of the New York Board of Health, has sent to Mayor Grant an exhaustive report drawn up by experts on the temperatures generated in the street sewers by the New York Steam Heating Company's mains. Five feet under Broadway, it appears, in an excavation 14 ft. from the steam main, the heat was 200 deg. Fahr. The heat in another instance, in a subterranean vault, was found to be 160 deg., and in another 137 deg. Fahr. The Board of Health has ordered the Steam-Heating Company to shut off steam at four different points.

ENGINEERING WORKS IN TURKEY.—According to the Daily News, a convention has been recently concluded between the Turkish and Montenegrin Governments for the regulation of the Drin and Boyana Rivers. This convention necessitates certain engineering operations by a company to which the Ministry of Public Works at Constantinople invites the attendance of capitalists. The Montenegrins in possession of her Majesty's Government on the subject can be seen on personal application at the Commercial Department of the Foreign Office.

NEW MUSEUM AT CHRISTIANA.—The programme has been issued for the building of a new historical museum at Christiania.

NORWEGIAN BUILDING LAWS.—Some years ago the official residence of the Bishop of Christiania was re-built, and it has now been discovered that the timber in the building is seriously attacked by fungus. In consequence, and according to law, an action has been brought against the architect and builder by the owner—the Norwegian Ecclesiastical Office.

## MISCELLANEOUS.

A SUPPOSED RELIC OF SERPENT WORSHIP.—According to the New York Herald, a mammoth mound in the form of a snake has been found between Carthage and Quincy, Illinois, by the Rev. S. D. Peet. According to the description, "a clearly-defined rattlesnake lies coiled along the ground following the line of the bluff. Its entire length is 1,450 ft. The ridge has been ploughed down until it is now only 2 or 3 ft. above the surface, but the outlines are still plainly discernible. The mounds at the coils of the serpent are 10 or 12 ft. high. The specific dimensions are 600 ft. from the head to the coils, the coils occupy a space 300 ft. in length and are made up of four distinct mounds 100 ft. apart. From the coils to the rattle of the snake is 450 ft., and there are three rattles counting a space of 100 ft. The serpent lies north and south, a straight line drawn through it showing a deflection to the east of 50 ft. near the head and 75 ft. near the tail."

ART IN SARDINIA AND JUDEA.—In the review of this work in our last issue, we inadvertently attributed to the authors an expression indicating that the temple of Ezekiel, which they endeavour to restore, had been "faded," which of course they did not imply; it was only described or imagined.

ARCHAEOLOGICAL SOCIETIES.—We are compelled to defer any report of the meetings of the Kent Archaeological Society and the Bristol and Gloucestershire Archaeological Society; both of which were held this week, the former at Canterbury, the latter at Bristol.

THE WARRINGTON IMPROVEMENT BILL.—The House of Commons Select Committee on this Bill on the 16th inst. decided that the preamble of the Bill was proved, though the provisions would have to be amended with regard to the limits of the borough, and the boundary would be limited to the existing southern boundary of the borough. This gives the extension asked for, excepting the part of the township of Warrington outside the borough, the Arpley Meadows, and the Cheshire portions proposed to be included.

OPEN SPACES, &c., FOR OPENSHAW, NEAR MANCHESTER.—The Local Board of Openshaw having applied to the Local Government Board for sanction to borrow 12,550l. for purposes of public walks and pleasure grounds, and 7,150l. for works of private improvement, an inquiry was held on the 10th inst. by Colonel Ducat, R.E., an inspector of the Local Government Board. The Board have provisionally obtained from Colonel Cornwall Legh a site having an area of 40,648 square yards. It is situated to the left of Ashton Old-road, immediately behind the offices of the Local Board. The streets which it is proposed to pave and sewer are twenty-two in number.

THE CENSUS BILL.—It has long been felt by those taking the deepest interest in health progress that it is urgently necessary to get power in the forthcoming Census Act to take an intermediate and comparatively simple enumeration of the people between the decennial censuses of 1891 and 1901. It is not necessary to multiply examples of the difficulty in which sanitary authorities at the present time are placed by the impossibility of arriving at any estimate of the population of their districts, inasmuch as the Registrar-General has long since ceased to make any estimates of the present population, or to publish death-rates of any but the largest towns and areas. It may be noted, however, as a solitary example of this difficulty, that the population of the district of Whitechapel, which was 76,573 in 1871, had declined in 1881 to 71,385. We see no good ground for believing that the Whitechapel population has continued to decline since 1881 at the same rate that prevailed between 1871 and 1881; but at the same time there is little evidence of the assumed increase of population. When, however, it appears impossible satisfactorily to estimate the population of a sanitary district like Whitechapel within 5,000 or 10,000 of its true number, it must be obvious that any calculated rate of mortality for the district must be divested of most of its value as an indication of sanitary condition. It is earnestly to be hoped that the Government will not in their Census Act lose sight of the two facts—(1) That no trustworthy death-rates can be continuously calculated for sanitary districts without more frequent counting of the population; and (2) that without trustworthy death-rates it is impossible to stimulate, or even to maintain, the rate of sanitary progress which has effected so much real improvement in public health in recent years.

PAVE ASPHALT WORK AT THE FORTH BRIDGE.—A little late in the day, we are asked to state that the asphalt work in connexion with this bridge has been done by the Seyssel and Metallic Lava Asphalt Co. (Mr. H. Glenn), 42, Poultry, London; and consisted of six miles run of Seyssel asphalt in wheel track troughs, half an inch thick; three miles run of asphalt on convex buckle-plates in ash troughs 3 ft. 8 in. wide; 1½ miles run of asphalt on similar plates in "six-foot way;" 3 miles run of asphalt concrete (60 parts Seyssel asphalt and 40 parts whinstone) in concave buckle-plates to form footpaths 4 ft. to 6 ft. wide; 3½ miles run of asphalt, 1 in. thick, from 5 ft. to 6 ft. wide; 80,000 square feet of ½ in. Seyssel asphalt on concave buckled plates; 8 acres of coating on steel plates with best refined bitumen, to receive asphalt. The whole of this work was completed in nine months and five days, and was continued day and night.

WAGES OF DONCASTER JOINERS AND CARPENTERS.—A meeting was held on the 17th inst. of the operative joiners and carpenters of Doncaster. It was said that the masters had agreed that the rate of pay in future should be 7½d. per hour, 8½d. for the first two hours overtime, and 11½d. per hour after this. The men, however, had drawn up certain rules, but the masters had proposed certain amendments. These the men at their meeting accepted by seventy votes to six.

SOCIETY DINNER.—The General Purposes Committee (past and present) of the combined London Lodges of the United Operative Plumbers' Association of Great Britain and Ireland met for their annual dinner at the "Queen's Arms," Queen-street, Cannon-street, on Monday, the 21st inst. GODFREY, of Nafferton, Yorkshire, has been appointed Surveyor and Inspector to the Godstone Rural Sanitary Authority. There were 110 applications.

THE FORSE ESTATE, CAITHNESS-SHIRE.—This extensive property will be offered for sale in Edinburgh on the 29th instant. It covers more than 11,000 acres, whereof 2,195 are under cultivation, and 8,835 are pasture land, yielding a rental of 2,661l. per annum. The mansion house, overlooking the harbour and the sea, stands by the ruins of Forse Castle. Five years ago this estate was "exposed" at 80,000l., it is now to be put up at an upset price of 62,000l.



**THIS YEAR'S ART CONGRESS IN BIRMINGHAM.**—A meeting of the Reception and Entertainments Committee was held on the 16th inst. at the Council House. Mr. C. E. Mathews presided, and those present included the Mayor (Alderman Clayton) and Sir Thomas Martineau. The Hon. Sec. (Mr. Whitworth Wallis) reported that the Presidential address would be delivered on the evening of Tuesday, November 4, and that the actual work of the sections would commence at 11 a.m. the same day. He also reported that arrangements had been made for the use of the large lecture theatre of the Midland Institute, and of rooms in the Mason College, the Council House, and the Town Hall, for the purposes of the meetings. It was decided to fix Wednesday, November 5, as the date for the reception by the Mayor, and Friday, the 7th, for the one to be given by the local Committee, which would take place in the Edgbaston Assembly Rooms. The Chairman and Honorary Secretary were requested to prepare for circulation a preliminary programme of the arrangements for the Congress.

**OPENING OF A NEW STREET.**—On Monday last Lord Rosebery opened the new street running from the Holborn Town-hall to Farringdon-road, which will be known as Rosebery-avenue.

**SALE OF ARCHITECTURAL AND TOPOGRAPHICAL BOOKS.**—On Saturday last and the following four days, the stock-in-trade of the late Mr. James Sage, of Newman-row, Lincoln's Inn-fields, was sold by Messrs. Sotheby, Wilkinson, & Hodge. This consisted of a valuable collection of books relating to architecture, topography, county and family histories, heraldry, biography, and so on. The architectural section was unusually rich in well-bound copies of standard works by such writers as Dart, J. Britton, E. King, E. W. Brayley, W. Woolnough, Pugin, J. Skelton, E. Blore, H. Wilkins, with many others. On Monday some quarto volumes were sold as follows:—F. Nash's "Views of Paris and Environs," a large paper copy, two vols. in one (1829), 10s.; J. T. Smith's "Cries of London" (1839), 11s.; J. Britton's "Views in Western England," plates by T. H. Shepherd (1829), and Shepherd's "Modern Athens" (1829), 15s.; J. T. Smith's "Antiquities of Westminster," 246 etchings and the 62 additional plates, two vols. (1807-1809), 3l. 18s.; J. Britton's "Picturesque Antiquities of English Cities," on large paper, with India proof plates (1830), 37s.; and his "Architectural Antiquities," four vols., on large paper (1807-1814), 3l. 14s.; R. W. Billings' "Durham Cathedral," on large paper, Le Keux's plates, all with the engraver's duplicates (1848), 36s.; D. Lysons's "Environns," complete, six vols. (1798-1811), 3l. 3s.; W. S. Gibson's "Tyne-mouth Monastery," two vols., partly illuminated (1846-1847), 2l. 7s.; and Grose's "Antiquarian Repertory," four vols. (1807-1809), 29s.

FROM the *Courier de l'Art* we learn that the Museum of Arms and Armour at Brussels has been separated from the Museum of Antiquities and installed in the keep of the ancient Porte de Hal. The Museum of Antiquities will now occupy a portion of the galleries on the site of the ancient Champ des Manœuvres, at the end of the Rue de la Loi. In the same paper it is stated that the collections of the Antwerp Museum are placed in the new building which has been erected on a site where the collection will be more isolated and less exposed to risk from fire. It was announced that the museum would be opened on July 26 by King Leopold II.

**CHAMP DE MARS FÊTES.**—The *Semaine des Constructions* of July 19 publishes an interesting article on the fêtes which have taken place on the Champ de Mars under the Revolution and under Napoleon I. The first of these was that in which figured the Autel de la Patrie. The last of the series was that in which Napoleon, after his return from Elba, administered to his troops the new oath to the Imperial constitution. As the author, M. Henri de Clouzot, dryly remarks, "Waterloo followed in a few days after. Since then the Champ de Mars was left alone (having too many inauspicious memories connected with it) until the recent exhibition gave back to it something of its old importance."

**EDINBURGH.**—Mr. Rhind's statue of the late Sir William Chambers, to be placed in Chambers-street, Edinburgh, opposite the Museum of Science and Art, has been sent to be cast in bronze. The sculptor has since modelled three panels for the pedestal, having symbolical female figures of Literature, Liberty, and Perseverance. These Mr. Rhind considers as requisite to the complete artistic realisation of the work, but it appears that no provision was made for them in the sum originally voted for the statue. Mr. Rhind asks 1500l. for the purpose, certainly a very small demand for such work. An endeavour will be made to raise the amount either by a grant from the Town Council, or, failing that, by public subscription.

**NEW ASYLUM, EDINBURGH.**—The commemorative-stone of the new asylum for the insane at Craigshouse, near Edinburgh, was laid on the 17th inst., by the Earl of Stair. The cost of the building will amount to nearly 50,000l., and the plans have been prepared by Mr. Sydney Mitchell. From rough designs by Dr. Clouston, the physician-superintendent of the Institution.

**"SHALL GAS UNDERTAKINGS SUPPLY ELECTRICITY?"** was the title of a paper read by Mr. Arthur F. Guy at the recent annual general meeting of the members of the Gas Institute, held at Ryde, I.W. Mr. Guy answered the question in the affirmative.

**NEW MISSION CHURCH AND HALL, LONDON.**—The foundation-stone has lately been laid by Lady Wimbome, of a New Mission Church and Hall in Canterbury-road, Old Kent-rd., S.E., for Corpus Christi College (Cambridge) Mission. The building has two floors, the lower one being devoted to a hall capable of seating 500 people. The church is on the first floor and has a chancel, sanctuary, &c., and seats about 500. The architect is Mr. Richard J. Lovell, of London, and the builder, Mr. B. E. Nightingale.

**THE ENGLISH IRON TRADE.**—There is a little more animation in the English iron market, and although prices do not show any appreciable advance, they are rather rising. More business is reported in pig-iron, sellers having mostly the advantage. The Glasgow warrant market has been steady, and the same may be said of Scotch makers' iron. Cleveland pig shows an improvement of 6d. per ton on the week. Lancashire iron is fairly firm, and the advance in Staffordshire is maintained. Bessemer pig is likewise selling at an improved price. Manufactured iron is slightly better as regards inquiry, but not with respect to price, although the latter is fairly steady. A fairly active demand is maintained for steel, at tolerably steady prices. The outlook in the shipbuilding trade is, to say the least, not worse, the few orders that have lately been placed giving rise to fresh hopes. Engineers do not secure much fresh work.—*Iron.*

**THE MULGRAVE CASTLE COLLECTION.**—A sale of the art collection of the Reverend the Marquess of Normandy was conducted at Christie's in the course of last week. The effects embraced numerous objects of racing and other plate, porcelain, metal, ivory, and the like. The paintings included portraits of the Duchess of Portsmouth, and William Phipps, by Lely and Kneller respectively; Gainsborough's Constantine, second Lord Mulgrave, and his nephew Colonel Charles Phipps, of the new Scots Guards, sold for 955l. 10s., and 110l. 5s.; and Reynolds's Lady Lepel, daughter of John Lord Hervey, who married the first Baron Mulgrave, and their two sons, the above-named Constantine, and his successor, Henry, first Earl of Mulgrave. The last three paintings were sold for 273l., 283l. 10s., and 372l. 15s. Also the original sketches for Wilkie's "Blind Fiddler" (36l. 15s.), and "Rent Day" (84l.).

## LEGAL.

### DISTRICT SURVEYORS' FEES.

A DIVISIONAL COURT OF QUEEN'S BENCH on the 17th inst. granted a rule calling upon Mr. Bennett, Stipendiary Magistrate of the West London Police Court, and Mr. Williams, District Surveyor of South Kensington, to show cause why a mandamus should not issue commanding the Magistrate to state a case.

The motion was made on behalf of Mr. Frederick Moly, builder, and proprietor of a block of residential flats known as the Kensington Court, containing fourteen separate residences under one roof, and the question at issue is whether the District Surveyor is entitled to charge fees for fourteen separate residences or for one.

The question is of some importance, as, if the Surveyor's contention is maintained, large fees would have to be paid.

### REMUNERATION OF ASSISTANT COUNTY SURVEYORS IN IRELAND.

At the *A-sizes* for the County of Down, Ireland, on the 17th inst., before Mr. Justice Andrews, Mr. Harrison, barrister-at-law (instructed by Mr. F. W. Crawley, Downpatrick), on behalf of the Assistant County Surveyors, applied regarding a question of expenses which they had incurred in connexion with their duties, and which the Grand Jury considered they were not entitled legally to pass. Counsel said that several of the roads throughout the county had continued uncontracted for, and on this account the Assistant Surveyors had contracted considerable expense in the way of superintending the works that had to be done by the County Surveyor. The matter had come before the Grand Jury on a pretty large scale, and he understood that the County Surveyors Committee had decided that there was no power given to them in any Act of Parliament by which they could grant this or any similar remuneration.

His Lordship—As I understand you, it is not so much a question of remuneration as of recompense of expenses.

Mr. Harrison said that in the barony of Castle-reagh there had been an enormous amount of roads for which contractors would not come forward, and the County Surveyor had to take over works that would cost 22,000l. The Assistant County Surveyor told him that he would have to pay something like

£50 in respect of expense to which he had been put in superintending the making of these roads. His whole salary was now £80 a year, so that the decision of the Grand Jury practically fixed him £30 for the default of the road contractors, thus leaving him only £50 for the year's salary. After citing sections of the Act of Parliament bearing on the question, counsel pointed out that the same matter had come up several years ago before Lord O'Hagan, who decided that the Grand Jury had power to make this recompense.

After further discussion, His Lordship said (as reported in the *Belfast Newsletter*) that while *prima facie* there was a case in favour of the Assistant Surveyors, his opinion was most against them on the point of law, and the most he could do was to state a case for the superior court, in case Mr. Harrison had himself a strong opinion on the subject as to the justice of the application. Of course, the Grand Jury were the best judges of what would be just in a case of that kind, and they seemed to feel that if they had the power to make good what appeared to them a reasonable allowance for the extraordinary expenses which had arisen to the Assistant Surveyors through no fault of their own. If Mr. Harrison thought he had a strong case he (his Lordship) would take the presentment for what the Grand Jury thought fit, and state a case if it were agreeable to those making the application. Of course it would involve some substantial expense, but his present opinion was that unquestionably he would have no power to grant the application at present.

On the application of Mr. Orr, O.C. (instructed by Mr. B. N. Johnson, Solicitor to the Grand Jury), and after a prolonged discussion,

His Lordship stated a presentment granting the County Surveyor, Mr. P. C. Cowan, a sum of 1000l. in addition to his ordinary salary of 6000l. for acting as architect for the present year in connexion with certain necessary repairs to the court-houses throughout the county.

### THE ERECTION OF A STUDIO.—ALLEGED BREACH OF CONTRACT.

At the Manchester Assizes on the 19th inst., Mr. Wm. Mabon, builder and contractor, of Hulme, brought an action against Alan L. McLachlan to recover a balance of 496l. 16s. alleged to be due, and for damages arising from a breach of contract in the erection of a studio for the defendant at Chorlton-on-Medley, the total of which the plaintiff said amounted in round figures to 1,180l. The defendant denied his liability, and repudiated having entered into any contract of the character alleged by the plaintiff. After the case had been partly heard, the services of the jury were dispensed with, each side being satisfied to leave the issue to the Judge. After a long inquiry, his Lordship said he had come to the conclusion that no contract had been proved to exist upon which the plaintiff could prove. There had been work done, and there had been payment made. The matter must be submitted to a referee, and upon that report, which was to be sent to him in writing, he would give judgment, and adjudicate upon the costs.—*Manchester Courier.*

## RECENT PATENTS.

### ABSTRACTS OF SPECIFICATIONS.

11,445.—DOOR-KNOBS: A. & T. Leadbetter.—By this invention the sides of the square spindle are grooved across, so that on one side being half the pitch of the other. A washer in segments is provided with a square recess, so that when the two pieces are placed together a square hole is left in the centre of the washer, through which the spindle passes. The two segments of the washer are hinged together at one side, and held together at the opposite side by a screw, arranged preferably so as to pass radially through a lip or tongue on the one segment into the body of the other segment, or by means of a spring latch or catch. The smaller of the two segments is provided on the straight face; over the spindle is a series of projecting V teeth of such a size as to fit the recess in the spindle; the knob can then be adjusted by screwing or unscrewing.

12,180.—SASH-FASTENERS: J. W. Wilcocks and another.—This invention relates to an automatic sash-lock, an arm of which is pivoted on an horizontal axis to one of the sashes, and engages with a horn or horns on the other part of the sash. At the end of the pivoted arm is connected a catch, the free end of which is adapted to engage with the horn so that, when the arm has been moved into engagement, it cannot be disengaged until the catch is moved out of engagement with the horn. In order to open the sashes, the arm is thrown back, and a lug thereon is adapted to project into the path of a pivoted tapered lever arranged in conjunction with the horn. When the sashes are nearly closed the tappet engages with the lug to throw the arm down into its locking position.

20,175.—DOOR-CLOSER: B. Poyne.—This invention relates to an appliance for effecting the self-closing of a door, by double or single action, with gentle motion; working by the compressed action of a vertical spiral spring on an angular sleeve and double-action with angular cam of shaft, in vertical position, the spring relieving part of the friction of shaft from footstep.

3,722.—FLUSHING APPARATUS: W. Witter.—This relates to an improved apparatus by which the quantity of water used in flushing is regulated, and the pressure at will. It enables the descent of the basin can be determined or retarded to vary the quantity of water deemed necessary. It also acts automatically. Mechanism



inn," and 1830, *Soph.*, cf. Buckhurst-hill, 4,100'; 24 and 25, Peter-st. *Soph.*, up to 73 yrs. gr. 521. 10s. 2,210'. By *Bradsham Brown*: 78, Terrace-rd., Upton Manor, f. r. 27, 68, 800'; 1 to 13 (odd), Royal-rd., Cusumon-rd., 100'; 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821,

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JULY 16. — *By Walford & Withkin*: 12 and 13, Him-  
man's-rd., Peckham, 1 r. 411. 12s. 45s; 163, Selhurst  
rd., Norwood, 1. 493. — *By W. Levens*: "Arig-  
House," Cooper's Cope-d., Beckenham, 1. 493. —  
JULY 20. — *By Walford & Withkin*: *Payne, & Payne*, 6  
Hextable-villas, Swanley, 1. 92 yrs. 1 r. 101. 20s.  
— *By Wyatt & Son* (at Chichester): five cottages, 21  
yrs., 1 r. 2s. 6d., Theatre-lane, Chichester, 270s.

JULY 17. — *By Field & Sons*: 61, Riley-at., Ber-  
mondsey, 1. 493. — *By Walford & Withkin*: 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782

loc. 12 to 11, Rønnebu-Årstad, Sydalen  
 g.r. 344, r. 1198, 12s, g.r. 1112, 12s, 1000, 23 to 39 (od)  
 21 yrs, g.r. 244, r. 1112, 16s, 1000, 23 to 39 (od)  
 20 yrs, u.t. all, g.r. 332, 12s, 1252, 12  
 Whateley-rd., Dulwich, g.r. 764, 11 and 12, Pk-grov  
 Bromley, u.t. 74, g.r. 117, 3800, 612, Old Kent-rd.  
 u.t. 21 yrs, g.r. 61, r. 484, 2000, 121, Shenley-rd.  
 Camberwell, u.t. 86 yrs, g.r. 61, r. 341, 3502, 8  
 Uverscroft-rd., Dulwich, u.t. 75 yrs, g.r. 46, 10s  
 231. 8s, 1852, 29, Thorne-rd., Wandsworth, u.t.  
 7s, 1851, 29, 144. 6s, 400—By A. Young: A plot of  
 land, 14,470 ft. Cartwright-st., East Smithfield, 1550  
 Two plots of f. land, area 8,152 ft., Cotton-st., Poplar

1,000 $\ell$ .; A plot of f. land, area 570 ft., Cooper's-  
East Smithfield, 90 $\ell$ .; A plot of f. land, area 306 ft.,  
Shorter's-rents, Whitechapel, 140 $\ell$ .; A plot of f. land,  
area 834 ft., Rosebery-avenue, Holborn, 65 $\ell$ .;  
plot of land, area 628 ft., Charing-cross-  
let at 102 $\ell$ . p.a.; A plot of land, area 1,4  
ft. near Bowyer, Hammer-smith let at 50 $\ell$ . p.a.

[illegible]

Greenheart, B.G.	ton	8 10	0	7 10
Teak, E.I.	load	3 0	14	0
Shorea, V.I.	load	3 0	14	0
Ash, Canada	foot	3 0	0	43 0
Birch	"	3 0	0	5 0
Elm	"	3 10	0	41 5
Fig, Danish, &c.	"	3 0	0	40 0
Oak	"	2 10	0	42 0
" Canada	"	5 10	0	6 10
Pine, Canada red	"	2 10	0	3 10
" " yellow	"	2 10	0	3 10
Lath, Danish	"	5 0	0	6 0
St. Petersburg	"	5 0	0	7 0
Walnut, Sic. &c.	log	5 0	0	0 0
Dens, Finland, 2nd and 1st std.	"	7 15	0	10 0
" " 4th and 3rd	"	7 0	0	7 10
Riga	"	6 0	0	8 10
St. Petersburg, 1st yellow	"	9 10	0	14 0
" " 2nd	"	7 0	0	10 0
Sweden	white	7 0	0	15 0
White Sen	"	8 0	0	17 0
Canada, 1st	2nd	15 0	0	16 0
" " 3rd	"	10 0	0	16 10
" " Spruce, 1st	"	7 0	0	10 0
" " Spruce, 2nd	"	8 15	0	11 0
New Brunswick, &c.	red	6 0	0	8 0
Battens, all kinds	"	5 0	0	16 0
Flooring Boards, qtr, 1 in, prepared, 1st	"	0 10	0	0 14
Second	"	0 8 0	0	0 7 9
Other qualities	"	0 6 0	0	0 7 9
Cedar, Cuba	foot	0 0	4	0 0 44
Honduras, &c.	"	0 0	4	0 0 44
Malacca	"	0 0	44	0 0 44
St. Domingo, cargo average	"	0 0	5	0 0 54
Mexican	"	0 0	44	0 0 54
Tobacco	"	0 0	54	0 0 54
Honduras	"	0 0	54	0 0 54
Box, Turkey	ton	5 0	0	18 0
Rose, Rio	"	14 0	0	19 0
Bahia	"	13 0	0	18 0
Rio, St. Domingo	"	13 0	0	18 0
Porto Rico	"	0 0	9	0 1 24
Walnut, Italian	"	0 0	4	0 0 4

IRON—Bar, Welsh, in London to	6	10	0	£	17	6
“ “ at works in Wales	6	10	0	£	10	0
“ “ St. Roderick, in London	6	10	0	£	5	0
CORR.—British, in London and India	62	0	0	£	83	0
Best selected	64	10	0	£	65	10
Sheets, strong	71	0	0	£	0	0
Chill, bars	68	0	0	£	0	0
YELLOW METAL—lb.	10	0	6	£	0	0
English, com. brands	12	17	6	£	13	0
Sheet, English, 3 lbs. per square foot and upwards	15	10	0	£	0	0
Pipe	16	10	0	£	0	0
THE—	15	0	0	£	0	0
Straits	95	10	0	£	0	0
Australian	95	10	0	£	0	0
English Ingots	98	10	0	£	0	0

Linseed .....	ton	23	17	6	24	7	6
Cocoonut, Cochín .....		33	0	0	0	0	0
Cocoonut, Ceylon .....		28	10	0	0	0	0
Palm, Lagos .....		26	0	0	0	0	0
Rapeseed, English pale .....		30	5	0	0	0	0
..... brown .....		28	15	0	29	0	0
Cottonseed, refined .....		21	10	0	0	0	0
Tallow and Oleine .....		21	0	0	40	0	0
Lubricating, U.S. ....		5	10	0	8	0	0
..... refined .....		7	0	0	12	0	0
TAR—Stockholm .....	barrel	1	3	0	0	0	0
Archangel .....		0	15	0	0	0	0







LLANDRINDOD WELLS (WALES).—For house at Llandrindod Wells, for Mr. Rees Davies. Mr. F. Boreham, architect, 75, Finsbury-pavement:—

Fritchard .....	£1,200 0 0
Price & Deakins .....	1,043 0 0
Hurst .....	985 0 0
Williams .....	980 0 0
Lewis & Co. (accepted) .....	945 0 0

LONDON.—For erecting mansion at 23, Berkeley-square, W., for Mr. W. Grogan. Messrs. J. T. Wimpey & Arber, architects:—

Johnson .....	£7,680 0 0
Colls & Sons .....	7,640 0 0
Clark & Mannoch .....	7,604 0 0
Patman & Fotheringham .....	7,440 0 0
Lea .....	7,383 0 0
Lawrance & Sons .....	7,289 0 0
Prestige & Co. (accepted) .....	7,276 0 0

LONDON.—For rebuilding "The Prince Regent" public-house, Dulwich-road, for Mr. R. Revel. Messrs. Alexander & Gibson, architects. Quantities by Mr. H. E. Patman & Fotheringham:—

Patman & Fotheringham .....	£5,218 0 0
Mallidy .....	5,156 0 0
Anley .....	5,100 0 0
Wales .....	5,098 0 0
Holliday & Greenwood .....	4,975 0 0
Burns & Co. .....	4,959 0 0
J. Beale .....	4,908 0 0
W. D. Palmer, 75, Dulwich-road .....	4,823 0 0

LONDON.—For alterations at the Westminster gas-meter testing station, for the London County Council:—

Jas. Greenwood & Son .....	£450 0 0
E. Lawrance & Sons .....	439 0 0
T. R. Lambie .....	429 0 0
Co-operative Builders, Limited* .....	370 0 0

\* Accepted by the Sanitary and Special Purposes Committee.

LONDON.—For cleaning, white-washing, and painting at the Workhouse Infirmary, Chelsea, for the Chelsea Board of Guardians:—

Griffiths .....	£370 18 0
Cartwright .....	249 0 0
Burbridge .....	248 10 0
Randall, Peckham .....	236 0 0
Seale & Son .....	229 0 0
Fades .....	228 0 0
Mackenzie .....	215 0 0
Mason .....	194 0 0
North .....	180 0 0
McCarthy .....	169 0 0
Stewart, Walworth .....	188 0 0
Foxley (accepted) .....	170 0 0

LONDON.—For repairs, &c., to Workhouse Infirmary, Havill-street, Camberwell, for the Camberwell Guardians. Mr. R. F. Whitlock, architect, 45, Finsbury-pavement:—

Stokes, Walworth .....	£1,250 0 0
F. & H. Higgs, Loughborough Junction .....	1,246 0 0
J. Ham & Son, Denmark Hill .....	1,048 10 0
W. Dudley, New Southgate .....	990 0 0
W. D. Goad, Camberwell .....	979 0 0
W. H. Castle, Southwark .....	945 0 0
W. Smith, Camberwell .....	929 0 0
J. Peattie, Kensington .....	827 0 0
R. & E. Evans, Peckham (accepted) .....	655 0 0

LONDON.—For repairs at St. John's-square Wesleyan Chapel, London. Mr. F. Boreham, architect:—

Lagler & Pinkham .....	£509 0 0
Anley .....	417 0 0
E. Lawrance & Sons .....	367 0 0
Long (accepted) .....	346 0 0

LONDON.—For painting and decorating at the Vestry Hall, Borough-road, S.E.:—

Canning & Mullins .....	£194 0 0
Glew .....	165 10 0
Hough .....	161 0 0
Castles Bros. .....	154 13 0
Stewart & Co., Walworth (accepted) .....	155 10 0

LONDON.—For painting and decorating at Vestry Hall, St. Mary, Newington. Messrs. Jarvis & Son, architects, Trinity-square, S.E.:—

Randall .....	£430 0 0
Lapthorne .....	389 0 0
Sayers .....	388 0 0
Castle .....	384 10 0
Cartwright .....	341 10 0
Paulkner .....	338 0 0
Stewart & Co. (accepted) .....	322 6 8
Fulger .....	323 0 0
Batchelor .....	322 0 0
Derby .....	328 10 0

LONDON.—For sundry repairs, alterations, and painting to twelve houses, Buchan-road, Nunhead, S.E., for Mr. W. H. Johnson:—

Stewart & Co., Walworth (accepted) .....	£212 14 0
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[No competition.]

LONDON.—For alterations to hot-water apparatus for the Board of Guardians, Fulham Union:—

Hayward Bros. & Co. .....	£241 0 0
Comyn Ching & Co. .....	379 0 0
J. E. F. May .....	347 0 0
Twissell & Son .....	340 5 0
Rosser & Russell .....	249 10 0
Risdale & Co. .....	228 16 0
Clarke & Sons .....	219 0 0
L. D. Berry & Son .....	218 0 0
Robert Crane .....	185 15 0
Benham & Sons (accepted) .....	178 15 0

LONDON.—For wood paving works for the parish of St. Margaret and St. John, Westminster:—

	Repairs on existing foundations.		New work.	
	John Mowlem & Co. s. d.	Improved Pavement Company. s. d.	John Mowlem & Co. s. d.	Improved Pavement Company. s. d.
Relaying old blocks, new foundations, with maintenance for three years, at per yard super .....	2 6	4 0	3 10	10 0
New wood-blocks, new or altered foundations, with maintenance for three years, at per yard super .....	7 10	7 10	9 10	11 3
Maintenance and repair for one or two years after expiration of three years, at per yard super per ann. ....	0 2½	0 2	0 2½	0 2
Ditto, ditto, for a further term of ten years, at per yard super per ann. ....	0 10	0 10	0 10	0 10
Extra for crocoted blocks, at per yard super .....	0 6	1 0	—	—
Extra for asphaltic joints, at per yard super .....	1 0	0 8	—	—

LONDON.—For erecting a coroner's court, mortuary, &c., at Manor-place, Walworth, for the Vestry of St. Mary, Newington. Messrs. H. Jarvis & Son, architects:—

G. Dickinson, Loughborough Junction .....	£3,550 0 0
F. Tarrant, Camberwell .....	2,642 0 0
J. Longley & Co., Crawley .....	2,605 0 0
J. Marland & Son, Walworth .....	2,505 0 0
Balaam Bros., Old Kent-road .....	2,475 0 0
A. E. Flew & Co., West Kensington .....	2,446 0 0
Barrett & Power, West Hackney .....	2,439 0 0
H. L. Holloway, Deptford .....	2,425 0 0
G. Luck, Mile End .....	2,426 0 0
W. & H. Castle, Southwark Bridge-road .....	2,363 0 0
Caples & Redgrave, Geydon .....	2,297 0 0
J. Williams, Harrington-square, N.W. ....	2,250 16 0
Scharian & Co., Chelsea .....	2,243 0 0
Southwaite & Son, E. Smithfield .....	2,200 0 0
Burnan & Son, Newington .....	2,200 0 0
Cox & Parsons, Battersea .....	2,199 14 0

\* Accepted.

LONDON.—For alterations to the Victoria Hall, Baywater, for Mr. P. J. George. Mr. C. J. C. Pawley, architect:—

F. Gill .....	£257 0 0
J. Mansbridge .....	249 7 7
Turtle & Appleton .....	695 0 0

LONDON.—For road works, Stanstead-road, Forest Hill, S.E., for the Lewisham Board of Works:—

Woodham & Fry, Lion Wharf, Greenwich (accepted) .....	£310 0 0
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LONDON.—For the construction of iron escape staircases at the Workhouse Infirmary, New-end, Hampstead, for the L.P.A.B., 3, Salters' Hall-court, E.C., architect:—

Fraser & Co. ....	£437 0 0
Marshall & Hatch .....	398 0 0
T. Potter & Son .....	346 0 0
St. Pancras L.C. ....	335 0 0
Peterson & Co. ....	315 0 0
C. Smith & Sons .....	235 0 0
J. F. Clark & Sons (accepted) .....	227 19 0
B. C. Badham & Co. ....	217 19 0
Constructional Iron Works Co. ....	195 0 0

LONDON.—For asphaltic paving works for the Board of Works for the Westminster District:—

1* 2* 3* 4* 5* 6* 7**	s. d. s. d. s. d. s. d. s. d. s. d. s. d.
Val de Travers .....	7 0 5 9 6 6 6 0 7 0 10 6 12 6
French Asphalt .....	6 0 5 0 5 9 5 3 6 10 0 12 0
Compressed asphalt, 1 in. thick, on 3 in. of concrete.	6 6 5 6 6 3 5 6 7 0 10 6 12 0
+ Compressed asphalt, 1 in. thick, on 3 in. of concrete.	—
† Mastic asphalt, 1 in. thick, on 3 in. of concrete.	—
‡ Mastic asphalt, 1 in. thick, on 3 in. of concrete.	—
§ Mastic asphalt, 1 in. thick, overlaid with compressed asphalt, 1 in. thick, on 3 in. of concrete.	—
Compressed asphalt, 1½ in. thick, on 6 in. of concrete.	—
** Compressed asphalt, 2 in. thick, on 6 in. of concrete.	—

LONDON.—For alterations and additions to Nos. 235 and 337, Gray's Inn-road, King's-cross, for Messrs. Harrington Sells, Dale & Co. Mr. Cecil G. Saunders, F.S.I., architect:—

Brass & Son .....	£1,463 0 0
Williams .....	1,429 0 0
Patman & Fotheringham .....	1,421 0 0
Mattcock Bros. ....	1,391 0 0
Godfrey & Son (accepted) .....	1,337 0 0

LONDON.—For providing and fixing external iron staircases to school at Brentwood, Essex, for the Hackney Union Guardians:—

T. Potter & Sons, Limited, 44, South Molton-street, W. ....	£698 0 0
E. G. Dulken & Co., 2, Biller-street, E.C. ....	675 0 0
B. C. Badham & Co., 10a, Featherstone-buildings, Holborn, W.C. ....	617 16 0
St. Francis Ironwork Company, St. Pancras-road, N.W. ....	657 0 0
J. Richmond & Co., 30, Kirby-street, Rathbone-garden .....	550 0 0
J. Cole, Hensham, Walton-on-Thames .....	498 0 0
Constructional Ironworks Company, Limited, Dace-road, Bow (accepted) .....	390 0 0

\* Builders work omitted.

LONDON.—For alterations and additions to No. 27, Merton-road, Kensington, for Messrs. F. Wright, Mundy, & Co. Mr. G. Gordon Stanham, architect, 1008, Queen Victoria-street:—

C. F. Kearley, Kensington* .....	£276 0 0
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\* Accepted.

LONDON.—For erecting and completing seven shops and houses in Tabad-street, S.E., for Messrs. Reid & Sons. Mr. A. J. Rowley, architect, 41, Goldsmith-street, Nottingham:—

French & Elward .....	£10,800 0 0
Kennard .....	10,319 0 0
Elder & Son .....	10,108 0 0
Joslyn & Young .....	9,875 0 0
Young & Lonsdale .....	9,843 0 0
Waddington & Co., Limited .....	9,835 0 0
Jerrard .....	9,733 0 0
Wood .....	9,593 0 0
Holliday & Greenwood .....	9,399 0 0
Greenwood & Sons .....	9,318 0 0
W. & H. Castle .....	9,092 0 0
Downs .....	9,075 0 0
Badley .....	9,067 0 0
Lawrence & Son .....	9,050 0 0
Rodwell .....	8,976 0 0
Higgs .....	8,930 0 0
W. & F. Croker .....	8,790 0 0
Back .....	7,373 0 0
E. H. Bax, Highbury (revised drawings) (accepted) .....	5,973 0 0

LONDON.—For additions to printing offices, Fetter-lane, R.C., for Messrs. Burt & Co. Messrs. E. Marsland & W. B. Brown, architects:—

Rides .....	£6,970 0 0
Colls & Sons .....	6,840 0 0
Patman & Fotheringham .....	6,673 0 0
Marsland .....	6,485 0 0
Goodman .....	6,466 0 0
Roberts (accepted) .....	6,387 0 0
Kearley .....	6,348 0 0
Nightingale .....	6,680 0 0

LONDON.—For sundry alterations, new shop-fittings, &c., at No. 3, Allen-terrace, Kensington, for Messrs. Rabbits & Sons. Mr. A. G. Hennell, Mayor-road, Forest Hill, S.E. architect:—

C. F. Kearley, Kensington* .....	£1,077 0 0
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\* Accepted.

NEWPORT (MON.).—For rebuilding premises, 35, Commercial-road, Newport, for Mr. Jno. Jones. Mr. Alfred Swash, architect and surveyor, Newport:—

Rees, Williams, & Sons .....	£390 0 0
Chas. C. Hely .....	386 0 0
Chas. Lock .....	365 10 0
Moulton & Browncombe .....	337 0 0
Jno. Linton .....	759 0 0
Geo. Wilkins .....	775 0 0
Morgan & Roberts .....	745 0 0
Thos. Webb .....	738 0 0
T. G. Diamond .....	720 0 0
E. Richards (accepted) .....	684 0 0

[All of Newport.]

PAIGNTON.—For building cottages, Goodington Farm, for Mr. J. F. Belfield. Mr. G. S. Bridgman, architect, Torquay:—

Drew & Milman, Paignton, accepted (without carting, &c.) .....	£217 0 0
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PLYMOUTH.—For piling and strengthening sea-wall, &c., Stonehouse Pool, Plymouth, for Messrs. J. Friend & Co. Mr. A. D. Shortridge, architect, 14, Old Town-street, Plymouth:—

A. K. Dehnam, Plymouth .....	£320 0 0
T. May, Plymouth .....	247 0 0
G. Shellabear, Plymouth .....	225 0 0
Lapthorne & Goad, Plymouth .....	180 0 0
T. Crews, Stonehouse .....	152 0 0

SALTASH.—For erecting dwelling-house at Saltash, near Plymouth, for Captain J. Taylor. Mr. A. D. Shortridge, architect, 14, Old Town-street, Plymouth:—

Palk & Partridge .....	£247 0 0
Tixer & Son .....	435 0 0
May .....	398 0 0
Jillard & Son .....	341 15 0

[All of Plymouth.]

SEAFORD (Sussex).—For building a Sunday-school at Seaford. Mr. E. J. Hamilton, architect, 70, Ship-street, Brighton:—

Smith & Son, Norwood .....	£1,247 0 0
Patching & Son, Brighton .....	690 0 0
Morling, Seaford .....	890 15 0
Wilkinson, Seaford .....	530 0 0
Baker, Seaford .....	812 0 0
Kibbey, Berry, & Kirk, Seaford .....	797 0 0
John Wilson, Alfriston* .....	778 10 0

\* Accepted subject to reductions.

SPRINGHILL (Worcestershire).—For building estate office and gardener's cottage at Springhill. Mr. E. Guy Dawber, architect:—

Stanley, Broom .....	£259 0 0
Groves, Milton-under-Wychwood .....	339 0 0

**WILLIAM BLOORE,**  
80 to 90, BOND STREET, VAUXHALL, and  
57 to 67, SOUTH LAMBETH ROAD, S.W.



# The Builder.

Vol. LIX. No. 2474.

SATURDAY, AUG. 2, 1890.

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### Legislation as affecting the Administration of Waterways.



THE Fourth International Congress on Inland Navigation has been held this week at Manchester, at present certainly a sufficiently appropriate centre for such a meeting. We observe, however, that the programme of the meeting, while dealing largely with Engineering and Trades questions, did not include any reference to the subject of legislation as affecting inland waterways and navigation. This being so, a short review of the history and the present state of canal legislation will not be out of place on this occasion, and may serve to fill up a gap in the list of subjects that have been discussed at the Manchester meeting.

Since the inception of the English railway system by the opening of the Stockton and Darlington Railway in 1825, which was materially accentuated by the completion of the first Liverpool and Manchester Railway in 1830, the commencement of one of the most marvellous of the developments to be found in the history of mankind, our artificial waterways have until quite recently been allowed to go by default. We have in effect neglected our canals for over half a century. It is only during the last few years that any evidence has been afforded of serious efforts to realise the great advantages which inland navigation under appropriate conditions can render to our enormous commerce. With all its imperfections our canal system, when considered in relation to the inferior resources existing at the period of its greatest expansion—the second half of the eighteenth century—has, nevertheless, been a truly great development, reflecting high credit upon the foresight and enterprise of the men of that day. The construction of the canals, which we are accustomed to look upon nowadays as slow and antiquated, had unquestionably infused new life into productive industry, developed our home and foreign trade, and the advantages conferred upon our most important industry, agriculture, were pre-eminently great. The provision of our inland waterways by our forefathers, placing the four great Ports of London, Liverpool, Hull, and Bristol in intercommunication with hundreds of miles of lateral canals, was a magnificent conception, and

we may justly credit much of our present prosperity to the foundations laid by the canal-makers of the eighteenth century. A striking illustration of the apathy and indifference manifested by the Legislature with regard to our canals,—which were before the railways,—is afforded by the fact that while in 1840 the railways by statute were placed under the jurisdiction of the Board of Trade, it was not until about half a century later that canals were also included among the functions of that Board by the provisions of the Railway and Canal Traffic Act, 1888, which came into operation from January 1, 1889.

Previously to 1845 our inland waterways were only regulated in their administration by the provisions of such statutes as were confined to the individual inland navigations which had been up to that time the subject of legislation. In that year the attention of the Legislature was drawn to certain influences at work which rendered competition between railways and canals extremely ineffective. Such a condition of things being highly prejudicial to the public interest, it was felt essential to give some encouragement to the weaker of the competitors,—the canals,—in order to ensure more effective competition. Accordingly the session of 1845 was characterised by the sanction of the Legislature being given to three well-known public statutes. There were respectively:—The Railway Clauses Consolidation Act, 1845 (8 and 9 Vict., cap. 20); the Canal Tolls Act, 1845 (8 and 9 Vict., cap. 28); and the Canal Companies Carriers Act, 1845 (8 and 9 Vict., cap. 42).

The preamble of the Canal Tolls Act, 1845, after noticing the provisions contained in the Railway Clauses Consolidation Act of the same session, conferring powers on railway companies to vary their rates according to the circumstances of traffic, recites that, "greater competition for the public advantage would be obtained if canal companies were to have the like powers granted to them in respect of their canals." Consequently, the Act grants to the canal companies powers identical with those given to the railway companies, to accommodate their rates to the varying conditions of traffic.

Simultaneously, and with a similar object, the Canal Companies Carriers Act, 1845, was passed in order to enable canal companies to become carriers of goods upon their canals, and to make working arrangements and to lease their canals to other canal companies.

The preamble of this Act also states that these powers being identical with those given to railway companies will give scope for greater public competition.

In 1845 the rage for railway speculation was of a most extraordinary character. The prices of railway stock, both of railways in actual operation and of projected lines merely existing on paper, rose immensely. As an illustration, in January of that year, Bolton, Wigan, and Liverpool 40*l.* shares with 4*l.* paid, were worth 44*l.* 10*s.*, and in September were selling at 42*l.* 15*s.* In the same period, Midland 100*l.* stock rose from 114*l.* to 188*l.*, and Great Western 100*l.* stock from 156*l.* to 228*l.* This railway mania of 1845-6 was a historical duplication of a canal mania in 1791-4,—no less than eighty-one statutes being passed relating to inland navigations during those four years. It had come to be said in 1846 that all that was required to obtain Parliamentary sanction for a Railway Bill was the specification of two points on the map of England which presented an opportunity for their connexion by a railway, whether there was any chance for traffic being secured or not. The result of this delirious excitement with regard to railway projects was that canal companies were very greatly alarmed at the prospects of competition. The outcome of the situation was that over 200 Bills were deposited for the consideration of Parliament during the session of 1846 containing provisions for railway and canal amalgamations. In some of these cases the railway companies had designedly acquired canals in order to extinguish competition. In other cases the purchasers of canals had been forced on the railway companies, in order to buy off opposition from the canal companies. The canal companies, apprehensive of diminished dividends, recognised their opportunity in the applications of the railway companies to Parliament to dispose of their undertakings on this ground. On the other hand, the railway companies, by making arrangements with the canal companies, succeeded in getting rid of serious opposition to their application to Parliament, and obtained the control of an amount of traffic which otherwise might be an awkward competitor; and a further advantage attended these arrangements, the railway companies thus acquiring feeders of traffic to their lines.

With over two hundred Bills relating to railway and canal amalgamations requiring the attention of Parliament during the ses-



sion of 1846, a Committee of the House of Commons was appointed for the consideration of the subject. The substance of their opinion was that while amalgamations between railways and canals should not be altogether refused, each case should be scrutinised on its individual merits. The imposition of a low scale of tolls and charges was essential in the case of canals, as the public are to a great extent their own carriers. In such cases as the conversion of a canal into a railway, care should be taken that no district is deprived of efficient means of communication, and the company concerned to afford due facilities of access to all parties affected by the change. A very important recommendation, which the Committee made "after mature consideration," is that—

"It is absolutely necessary that some department of the Executive Government should be so constituted as to command general respect and confidence, and charged with the supervision of railways and canals, with full power to enforce such regulations as may from time to time appear indispensable for the accommodation and general interest of the public."

On the recommendation of the Committee, a Railway Commission was appointed, but was abolished in 1851, its duties being handed over to the Board of Trade. During 1846 and 1847 the Legislature sanctioned the control or actual purchase by railway companies of 1,350 miles of navigable canals out of 3,000 miles in England and Wales.

The next important development in legislation regarding inland transport was Mr. Cardwell's well-known Act of 1854 (17th and 18th Vict., cap. 31), "An Act for the better regulation of railways and canals." This statute requires all companies to afford reasonable facilities for the conveyance of traffic without inordinate delay, and the strictest impartiality, and enables parties concerned to apply by motion or summons to a Superior Court; this being the first statute in which a special tribunal was fixed for the determination of issues relating to railway and canal traffic.

In 1858, a statute (21 and 22 Vict., cap. 7) was passed stipulating that canal companies which were also railway companies should not be permitted to lease any canal or the tolls, without the express sanction of Parliament. The object of this statute is to prevent the virtual amalgamations of canals with railways which had been effected under the pretence of leasing independent canals, by railway companies who were also canal companies, by reason of precedent purchase of navigable canals. In 1860, a further statute (23 and 24 Vict., cap. 42) made the Act of 1858 perpetual in its operation.

Nothing further was done by the Legislature of a practical character affecting the administration of canals until 1872, when a Joint Committee of the Lords and Commons was appointed to enter into an investigation of the whole bearings of the amalgamation question. The Committee made an exhaustive inquiry, and issued an able and comprehensive report. The following suggestions for the improvement and superior administration of canals were made by the Joint Select Committee:—

1. "That no inland navigation, now in the hands of a public trust, should be transferred to or placed under the control of a railway company; and that if the trustees of an inland navigation or a canal company apply to Parliament for power to purchase compulsorily a canal from a railway company, such purchase should be favourably regarded by Parliament."
2. That the utmost facilities should be given for the amalgamation of adjoining canals with one another, or with adjoining inland navigations."
3. That no canal should be transferred to or placed directly or indirectly under the control of any railway company, nor should any temporary lease of any canal to a railway company be renewed until it has been conclusively ascertained that the canals cannot be amalgamated with or worked by adjacent canals, or by a trust owning adjacent inland navigation."
4. That whenever a railway company, applying to Parliament for amalgamation, has under its ownership or control any canal communication in the district, the propriety of continuing or modifying such ownership or control should be a subject of

investigation by the Committee dealing with the Bill.

5. That the principles of the Railway and Canal Traffic Act should be strictly carried into effect by requiring every company owning or controlling a canal to maintain it in a state of thorough efficiency; to give every facility for through traffic; and to remove every obstacle, whether in the shape of bar tolls or otherwise, which are imposed for the purpose of impeding through traffic; and that these obligations should be enforced by proceedings before the Railway Commissioners.

6. That the owners of any canal or inland navigation should have power to make a through toll or rate from or to any place on its own canal, or to from any place on any other canal, or on railway forming a through route; the toll or rate to be divided between the owners of the different parts of the route, as a general rule according to mileage, but with a provision that if any objection be made to the proposed rate, toll, or division as unfair, and no agreement can be come to, the Commissioners shall upon the application of any of the parties interested decide the matters in dispute."

From the Report of the Joint Select Committee of 1872, it was made apparent to Parliament that the time had arrived for the constitution of a lay tribunal for the redress of grievances arising out of railway and canal matters. The following is the recommendation of the Committee in this connexion:—"To perform the various duties referred to in this Report a special body should be constituted, entitled the Railway and Canal Commission, which should not consist of less than three members. They should be persons of high standing, of whom one should be an eminent lawyer, and one should be thoroughly acquainted with the details and practice of railway management."

It devolved upon Lord Carlingford,—then Mr. Chichester Fortescue,—as President of the Board of Trade, to bring before Parliament a Bill based upon the Report of the Joint Select Committee. In passing through the Committees of both Houses, the powers which the Bill contemplated granting to the Commission were, as the consequence of formidable railway opposition, materially curtailed. After passing through these ordeals, at length the Bill emerged, and was placed on the statute book as, "An Act to make better provision for carrying into effect the Railway and Canal Traffic Act, 1854, and for other purposes connected therewith." This statute, 36th and 37th Victoria, cap. 48, received the Royal assent on July 21, 1873, and came into operation on September 1 of that year. The Commission was appointed for an experimental period of five years. Its powers were, however, prolonged in 1878, and since from time to time, until the supersession of previous legislation as affecting the administration of railways and canals by the Railway and Canal Traffic Act, on January 1, 1889.

Although the Act of 1873 rendered most excellent service, it was soon discovered that finality had not yet been attained to by the Legislature as regards railway and canal administration. As, however, the Railway and Canal Traffic Act, 1888, virtually consolidates precedent legislation, it is unnecessary to mention in detail the provisions of the enactment of 1873. Those interested in the limited number of cases which have arisen under the Act of 1873 will do well to consult the valuable work on "The Practice before the Railway Commissioners," by J. H. Balfour Browne, Registrar to the Railway Commission.

During 1881, a Select Committee of the House of Commons was appointed "to inquire into the charges of railway companies and canal companies for the conveyance of merchandise, minerals, agricultural produce, and parcels on railways and canals, into the law and other conditions affecting such charges, and into the working of the Railway Commission of 1873." This Select Committee, finding the inquiry could not be concluded during that session, only reported the evidence to Parliament, with a request to be reappointed during the next session. In 1882, another Committee, with the same functions, was nominated, the evidence given before the Select Committee of 1881 being referred to the Committee of 1882. No less

than 44,974 questions were asked, and, in addition to the voluminous minutes of proceedings, the appendices formed a volume exceeding 600 pages of matter. The recommendations made by the Committee with regard to canals in their Report dated July 27, 1882, are as follows:—

"That Parliament do not sanction any further control direct or indirect of canal navigation by a railway company."

"That the powers and jurisdiction of the Railway Commission may be made to cover—

(a) All questions arising under the special Acts or the public statutes for regulating railway or canal traffic affecting passengers or goods.

(b) The making of orders which may necessitate the co-operation of two or more railway or canal companies within the statutory obligations of the companies.

(c) Power to order through rates on the application of traders, but no such order to impose on a railway company a rate lower than the lower rate of such railway company for similar articles under similar circumstances.

(d) The revision of traffic agreements both of railways and canals, in as large a measure as the powers formerly exercised by the Board of Trade.

(f) The Commissioners to have power, on the joint application of parties, to act as referees in rating appeals."

The High Court of Justice to have power to refer to Railway Commission cases which involve questions under the Railway and Canal Traffic Acts.

The subject of canals in Ireland being under different conditions to that of canals in England, and large districts in Ireland having no other means of communication, that powers be given to Local Authorities or Public Trusts to acquire, extend, and maintain such canals in that country as may be deemed for the public benefit of the districts affected."

As might be naturally expected from the anomalous constitution of the Committee and the nature of the proceedings before it, the Report upon review is found to be inconclusive upon many important points. Of the twenty-seven members of the Committee, excluding the chairman, the Honourable Evelyn Ashley (at that time acting as Parliamentary Secretary to the Board of Trade), who may be assumed to be neutral from his function, of the remaining twenty-six no less than seven were railway magnates. The remaining nineteen members, although among the most capable men who could be selected from the House of Commons, were at a considerable disadvantage, owing to two important considerations, namely, that they could not possibly have the same measure of acquaintance with the questions involved as the seven railway members, nor had they the assistance at command which the railway members undoubtedly had, having at their back officials representing the law and traffic departments, who note every atom of evidence and prompt the railway magnates as occasion requires. The witnesses representing trades are for the most part unused to giving evidence, and are easily misled by the adroitness of questions suggested by practical railway officials. When it comes to the turn of these officials, they answer as veteran experts accustomed to be on the alert, and wide-awake in their replies to the insinuating inquiries made of them.

On February 22, 1883, on the motion of Mr. Thomas Salt, the Member for Stafford, a Select Committee of the House of Commons was appointed "to inquire into the condition and position of the canals and internal navigation of the country, to report thereupon, and to make such recommendations as may appear necessary." The Committee consisted of eighteen members of Parliament, held eleven sittings between April 19 and July 12, 1883, examined twenty-three witnesses, and asked 3,692 questions. The Minutes of Evidence and Appendix occupied 331 printed folios of matter. On July 12, 1883, the Committee reported to Parliament the evidence taken, but as it was not in their power to conclude the investigation during the session, recommended the reappointment of the Committee in the next session of Parliament. The Committee was not, however, reappointed, and legislation regulating the administration of canals rested in abeyance for several years.

The Railway and Canal Traffic Act, 1888, which received the Royal Assent on August



10 of that year (51 and 52 Vict., cap. 25) and came into operation on Jan. 1, 1889, may be said to have embodied all the essential features of precedent legislation relating to navigable canals, and supercedes all previous statutes regulating the administration of waterways. Its provisions have been largely governed by the recommendations of the Joint Select Committee of 1872, and those of the Select Committee of the House of Commons, 1881-82, on Railway and Canal Charges and the working of the Railway Commission appointed under the Act of 1873. The Act constitutes a new Commission, entitled "The Railway and Canal Commission," which has the status of a Court of Record to be judicially noticed. The Commission consists of two appointed and three *ex-officio* Commissioners. The Commission may act notwithstanding any vacancy that may occur. The two appointed Commissioners are to be chosen by Her Majesty on the recommendation of the Board of Trade, and one of them must be of experience in railway business. It is lawful for the Lord Chancellor of England, if he think fit, to remove for inability or misbehaviour any appointed Commissioners. Of the three *ex-officio* Commissioners, one must be nominated for each of the three kingdoms, and not be required to attend out of that part of the United Kingdom for which he is nominated. The *ex-officio* Commissioner in each case must be a Judge of a Superior Court; such as in England the Lord Chancellor, in Scotland the Lord President of the Court of Session, and in Ireland the Lord Chancellor of Ireland. If any Judge who is assigned as an *ex-officio* Commissioner is temporarily unable to attend, he may nominate a Judge of a Superior Court, who will be for any case he may hear an *ex-officio* Commissioner.

Any Local Authority,—say a Harbour Board or Conservancy Authority,—and any Council of a city or borough, any representative county body, any Justices assembled in Quarter Sessions, the Commissioners of Supply in any county in Scotland, or any Urban or Rural Sanitary Authority not being a Council, and any Association of Freighters or Chamber of Commerce or Agriculture, which may obtain a Certificate from the Board of Trade that, in the opinion of that Board, they are a proper body to make a complaint, may make such complaint to the Commission of any grievance which they have jurisdiction to determine, without proof that such Authority is aggrieved in the matter of complaint, and may also appear in opposition to any complaint made to the Commission in such cases as the Authorities appear to be likely to be affected by any determination of the Commission.

All powers granted by any precedent statutes relating to the Commission are by the Act of 1888 transferred to the Commission as newly constituted. No appeal shall be made from the Commission upon a question of fact or upon a question regarding the *locus standi* of a complainant except that, as otherwise provided by the Act, an appeal shall lie from the Commission to a superior Court of Appeal. The decision of a superior Court of Appeal shall be final, provided that when there has been any difference between any two superior Courts of Appeal, any superior Court of Appeal in which a matter of difference is pending may give leave to appeal to the House of Lords on such terms as to costs as the Courts shall determine, save as provided by the Act, an order or proceeding of the Commission shall not be questioned, and shall not be restrained by prohibition, injunction, certiorari, or otherwise, either at the instance of the Crown or otherwise. The Commissioners can determine all matters of law or fact, and as regards attendance and examination of witnesses, the inspection of property, and have all the other powers, rights, and principles vested in a superior Court.

All the clauses of Part II. of the Act of 1888 apply equally to both railway and canal companies, and both are bound to submit to the Board of Trade a revised classification of merchandise traffic, and also a revised

schedule of maximum rates proposed to be charged by the companies, and to fully state the nature and amount of all terminal charges proposed to be made. The Commission have powers to enforce legislative provisions with reference to through rates, undue preference, and the provision of reasonable facilities for traffic.

Annual returns made to the Board of Trade must contain such statistics as the Board require. Classification-tables must be open for inspection, and copies must be provided for sale.

The Act stipulates that section 15 of the Railways Regulation Act of 1873 (36 and 37 Vict., cap. 48) shall apply to the terminal charges of a canal company. The terms of the section are as follows:—"The Commission shall have power to hear and determine any question or dispute which may arise with respect to the terminal charges of any railway company when such charges have not been fixed by an Act of Parliament, and to decide what is a reasonable sum to be paid to any company for loading, unloading, covering collection, delivering, and other services of a like nature. Any decision of the Commissioners under this section shall be binding on all Courts and in all legal proceedings whatever."

The power of the Commission extends over canal rates, tolls, and charges where a railway company or its officers own or control the traffic of a canal.

Returns have to be made on or before January 1 of each year, a description of the qualification of the company and a description of the undertaking, and (at a certain period of the year to be fixed by the Board of Trade) giving particulars of traffic, capital, revenue, expenditure, and profits. When a canal is intended to be stopped for more than two days, the company have to report to the Board of Trade defining the period the stoppage may last, and on re-opening to inform that Board. Every canal company, by a date to be fixed by the Board of Trade, are required to send true copies of their by-laws, and any new by-laws will not have any force or effect until two months after sending the copy, unless the Board of Trade report earlier. Should the Board of Trade have any reason to suppose that a canal is in a condition dangerous to the public, or causing serious inconvenience or hindrance of traffic, the Board may on their own account appoint an officer to inspect and report.

Section 42 of the Railway and Canal Traffic Act of 1888 is very stringent with regard to the acquisition of any unauthorised interest in a canal by any railway company or its officers. The terms of the section are as follow:—

"No railway company or director or officer of a railway company shall without express statutory authority apply or use or authorise or permit the application or use of any part of the company's funds for the purpose of acquiring in the name of the railway company, or of any director, or officer of the railway company, or other person to purchase or acquire any canal interest, or of guaranteeing or repaying to any director or officer of the railway company, or other person who has purchased or acquired any canal interest, the sums of money expended or liability incurred by such director, officer, or person, in the purchase or acquisition of such canal interest, or any part of such money or liability. In the event of any contravention of the provisions of this section, the canal interest purchased in such contravention shall be forfeited to the Crown, and the directors or officers of the company, who so applied or used or authorised or permitted such application or use of the company's funds, shall be liable to repay to the company the sums so applied and the value of the canal interest so forfeited, and proceedings to compel such repayment may be taken by any shareholder in the company."

Canal companies may enter into agreement for through tolls, and may establish a clearing-house system. A novel feature introduced into the Act of 1888 is that the Board of Trade may be called in to arbitrate in any differences arising between the public and the railway and canal companies. No distinction between home and foreign trade is to be allowed. Special emphasis is given in the Act of 1888 to the rights of harbour authorities to complain of undue preference in favour

of a rival port. The Act of 1888 also stipulates that in the event of any canal being held to be unnecessary or to have become derelict, the Board of Trade, under the hand of the Secretary, may issue a warrant for its abandonment, and when the conditions of the Act have been fulfilled, may grant a discharge releasing the proprietors from all obligations of maintenance and any further liability. The definition of "derelict," as applied by the Act, describes a canal which is either unfit for navigation or has not been used for navigation for three years. Before a canal can be held as unnecessary the proprietors must fully satisfy the Board of Trade that such is the case, also that the application has been approved by the votes of a majority of the shareholders at a meeting specially convened, and that public notices as required by the Board of Trade have been given to such persons as are entitled in consequence of abandonment, and also that compensation has been given to such persons. In case of dispute as to the amount of compensation, the Board of Trade may determine the amount.

While it must be admitted that the Railway and Canal Traffic Act, 1888, is a great advance in the right direction, it cannot be claimed that it affords a final solution of the complicated difficulties attending legislative efforts to arrive at a perfect system of Government control of the administration of our railways and canals. The situation has even greatly intensified in its complexity since Robert Stephenson, on the occasion of his taking the chair as President of the Institution of Civil Engineers in 1856, thus summed up the position:—"Little more than a quarter of a century has elapsed since Parliament first began to legislate for railways. In that period a multitude of laws has been placed on the statute book, which will certainly excite the wonder, even if they fail to be the admiration of future generations. But it is not so much the number of the statutes regarding railways that excites surprise. The extraordinary feature of the Parliamentary legislation and practice consists in the anomalies, incongruities, irreconcilabilities, and absurdities which pervade this mass of legislation. A Commission was appointed a few years since for the consolidation of the statute law. If ever that Commission should have to deal with railway law, it will find itself in a dilemma. It will find that legislation for railways, both in principle and detail, is utterly irreconcilable, and that the only way of escaping the difficulties of the position would be to sweep away the whole from the statute book and legislate afresh."

The remaining statutes relating to matters affecting inland waterways which require mention may be dealt with by a brief reference; one of these, the Explosives Act, 1875 (38 & 39 Vict., c. 17), enables the canal companies to frame by-laws for the conveyance, loading, and discharging of gunpowder and other explosives. The Canal Boats Act, 1877 (40 and 41 Vict., c. 60), provides for the registration and regulation of canal boats used as dwellings; and the Canal Boats Act, 1884 (47 & 48 Vict., cap. 75), makes further provision for the registration of such boats. These statutes only apply to such of the canal companies, and such of the general public, as are carriers on the canal.

THE ENGLISH IRON TRADE.—The English iron market is quieter than last week, but perfectly steady at the higher prices. In pig-iron the business doing has been moderate, a firm tone prevailing. Middlesbrough pig No. 3 is 3d. a ton higher, and Bessemer iron has gone up 1s. 6d. a ton; but Scotch makers' iron is rather irregular in price, although there has only been a small traffic in warrants at firm rates. In Lancashire and Staffordshire makers hold firmly to the advanced prices. Manufactured iron is in rather better demand, but values show no real improvement with the exception of plates in the North, prices of which are stiffer. There are also some inquiries for steel-plates, due, probably, to the better prospects for shipbuilders, caused by fresh inquiries for new ships. Engineers continue tolerably well employed.—Iron.



## NOTES.

**T**HE Board of Trade have now submitted to the railway companies draft classifications and schedules of rates as revised by the Board. These documents are of the greatest importance, embodying as they do the decisions come to by the Department after considering the arguments of all parties interested. That they have recognised the justice of many of the objections made by the traders to the proposals of the railway companies is very evident, although they have not always adopted the counter-proposals of the former. With regard to the companies' claim to charge fractions of a quarter of a ton as a quarter of a ton,—to which the traders strongly objected,—the *Times* remarks that they have got their way upon the point, although a good deal of unnecessary fuss was made over it. As a matter of fact, however, the proposals of the Board are for this to be done only when a consignment exceeds five tons, while below that weight the companies may charge fractions of a quarter of a hundredweight as a quarter of a hundredweight,—which is only reasonable, and to which no trader will object. The "small's" question is of far greater importance, and the Board recommend a limit of 3 cwt., instead of 500 lbs., as at present. It will be remembered that the railway companies sought to raise this limit to 500 lbs., while the traders agitated for a reduction to 2 cwt. The decision will, doubtless, meet with some opposition on the part of the railway companies, particularly those whose trade is largely what may be described as a retail one. The adoption of this recommendation would make a considerable difference to many small traders, and would be viewed with a corresponding amount of disfavour by the railway companies concerned. After all, the latter have no great cause for complaint, as they were content with a 1 cwt. minimum a few years back, although possessing power to raise it to 500 lb. Moreover, the additional charge proposed to be authorised is rather higher than that at present levied by the companies. Both station and service terminals are recognised, but the sums claimed by the railway companies for the respective services are considerably reduced,—the extra amounts proposed to be imposed in the case of certain large towns being disallowed altogether. We apprehend that the companies will not submit to these reductions without protest, and there may be a further struggle upon this point,—and so, too, with regard to the mileage rates, which are also reduced. It may probably be taken for granted that, as a whole, the proposals of the Board commend themselves to the Railway and Canal Traders' Association, for at their annual general meeting on the 25th ult. they contented themselves with passing a resolution urging the desirability of the report of the Board being presented to Parliament without delay. It must be admitted that the officials of the Board have so far proved themselves quite competent to deal with this complicated and difficult business, although, of course, it does not follow that their decisions and recommendations will be accepted as final. The protracted nature of the inquiry has been no fault of theirs, and the present stage has really been reached more expeditiously than at one time seemed at all probable.

**T**HE Secretaries of the Institute of Architects have addressed a letter to the Secretary of H.M. Office of Works calling attention to the custom of that Office, in advertising for tenders, of not only stating that "The Commissioners do not hold themselves responsible for the accuracy of the quantities" but adding, "which must be verified by the persons desirous of tendering." The Institute letter points out all the reasons, well known to most of our readers, why such a stipulation is unfair and unreasonable, and that to be of any value such verification would in fact amount to taking out the quantities over again. The Secretary of the Office of

Works, in a brief reply states that he is instructed by the First Commissioner of Works to acquaint his correspondents, "for the information of the Council of the Institute of British Architects," that the words "which must be verified by the persons desirous of tendering" will in future be omitted from the Board's advertisements for tenders for building works. Nothing is said as to the clause to the effect that "the Commissioners do not hold themselves responsible for the accuracy of the quantities." Yet as the Office of Works issues the quantities, they certainly ought to make themselves responsible for their accuracy.

**W**E regret to see that the London County Council have disagreed with one recommendation of the Improvements Committee, and have refused to widen High-street, Kensington. This improvement is most urgently needed, and the fact that the Council will not undertake it shows how inadequate are their views of their duties. The cost of the improvement was estimated at 47,000*l.*, and every year that it is delayed will add to its cost. The work might have been done several years ago at less than it will cost now, and the refusal of the Council to proceed with it is not to the credit of the members, who, on questions of this nature, exhibit the narrow spirit of the average Vestryman. Members who have their own purely local interests to serve strenuously support schemes affecting their own localities, which in their view are, of course, always "metropolitan" in character, and therefore deserving of a contribution towards their cost from the central authority. When, however, a projected improvement is remote from their own district they pooch it, and the project is defeated unless an exchange of votes has been agreed to. It was alleged in the course of the debate on the Improvement Committee's Report on Tuesday that members representing districts remote from each other agreed to support each other's local schemes, on the principle of *quid pro quo*. Tactics of this kind are not likely to result in the soundest decisions on such questions, which ought to be dealt with on their individual merits, having due regard to the improvement of the arterial communications of the metropolis as a whole.

**S**OME hundreds of drawings are being exhibited at the South Kensington Museum, the work of the students in competition for the National Medals and Prizes. The architectural and decorative work, with which we have particularly to deal, is far from strong as a whole, although there is some praiseworthy work. Architectural design is decidedly poor, the only two specimens which seem worthy of notice being a Town-house by Frank B. Cooper, and a design for a church by C. Townson. The measured drawings of old work are better—those of the river front of the Naval College at Greenwich by G. Harvey, and the set of drawings of the Lady Chapel, Llandaff Cathedral, by John H. James, being apparently very carefully done. The latter set is, however, much spoiled by the introduction into the lettering and some of the architectural features of coloured ink. Some pencil sketches by Mr. A. H. Hind and a measured drawing of some panelling at St. Vincent, Ronen, are also worthy of note. The drawings of decorative work are numerous. A design by Miss Foster, for a mosaic floor, is excellent, particularly the full-size drawing; and good work dealing with the same subject and tiles, bears the names of Miss Wickham, Miss Mohun, Miss Roota, and Mr. Rathbone. The latter shows some very effective tiles of a reddish hue, with fish cleverly worked into the pattern and the border. Miss Brothers exhibits a textile design with dodos introduced, simple in design and good in colour. Among the wall-paper designs, that by L. P. Butterfield should be mentioned,—a bold flowing design in green and pink, and tapestry and silk hangings by James Atherton. An elegant design for a cup, with figure subjects

introduced, incidents from Tennyson's "Lady of Shalott," calls for mention, and an effective water-colour sketch of the mosaic fountain, which is still one of the sights at Pompeii, by Herbert Cole. The space allotted to these drawings is small, and it is a pity the authorities cannot place them where they can be better seen. Most of the works referred to have been awarded a medal, but the scattering of medals—gold, silver, and bronze—assumes large proportions at South Kensington. It seems probable that the standard of work would be raised if the number of prizes was smaller, to say nothing of the increased value of the prizes themselves to those who received them.

**A**CCORDING to Sir Edward Watkin's speech to the Metropolitan Railway shareholders last week, it seems that the imitation of the Eiffel Tower, to which the Chairman of the Metropolitan Railway is going to treat Londoners, is to be placed at Wembley Park, where the Company have purchased 480 acres of land. Whether an enterprise of this kind can be successful if Londoners have to reach it by rail may be doubted, for the tendency of the times is a disinclination in dwellers in the metropolis to patronise suburban amusements, however good. One thing, however, is clear, that if the tower is constructed at Wembley, the Board of Trade should insist on Baker-street station being enlarged, and means taken not only there but on the main line of the Metropolitan Railway to meet the increased traffic in an adequate manner. Baker-street station is now at times most dangerous for passenger traffic, and the Board of Trade, whose duty it is to see to the safety of the public on railways, ought not longer to overlook this matter.

**T**HE new portions of Chester Railway Station, which have been in progress for the last thirteen months, have now been opened for traffic. They add greatly to the accommodation of this important railway centre, which now takes its place as one of the largest junctions in England. It is another instance that the more flourishing a railway company is, the more it is willing, as is natural, to do for the convenience of the public, and it keeps up the reputation of the London and North-Western Railway Company for efficient service to the public. It is much to be desired that the Great Western Railway would set about building a new station at Reading, and the North-Western have also much work on hand to make Willesden Junction more convenient to the public.

**T**HE programme of the course of instruction in architecture at the Cornell University, U.S.A., shows that the Americans are in earnest in endeavouring to provide a systematic training in architecture as part of a university education. The course of study leading to the degree of a Bachelor of Science in Architecture is a very wide one, and seems calculated to turn out the student of architecture with some progress towards the attainment of that ideal of all-round knowledge indulged in by Vitruvius. It includes natural sciences, mathematics, geology, drawing, building materials and construction, stereotomy, &c. The following extract from the circular of information gives the outline of the subject of Building Construction as treated at Ithaca:—

"*Building Materials and Construction.*—This subject is taken up as early as practicable, in the second term of the Sophomore year. The nature, properties, and uses of stone, wood, iron, brick, &c., are explained by lectures. The methods of preparing materials for use are fully discussed. Instruction is given also in measuring, and making out bills of quantities. The various processes of building are then explained, and the ordinary forms of architectural structures fully illustrated. The determination of the bearing power of the soil, or bottom, the means of strengthening it when necessary, and the adjustment of the footings, receive special attention. The lectures are accompanied by nine hours a week of drawing, and followed in the succeeding term by twelve hours a



week of lectures and work in the draughting-room relating to the preparation of scale-working drawings, with full-sized details, and complete specifications and contracts. The subjects usually selected are (1) a frame dwelling; (2) slow burning construction on the system approved by the Boston Manufacturers' Mutual Fire Insurance Company; (3) advanced problems in wood, masonry, and iron construction. The last subject is continued through the Junior year by exercises in sketching, to scale, solutions of some of the more difficult problems incident to the detail of houses; by study of the mechanical principles involved in the construction of roofs, iron trusses, &c.; and finally by the complete working out of all the constructive requirements of a large commercial building, involving the calculation of loads, the determination of proper thicknesses of walls, the designing of box girders, the selection of I beams and wrought-iron columns, and the designing of cast-iron pillars. The department has the beginning of a collection of working drawings of buildings actually completed, contributed by prominent architects, including examples of public, domestic, educational, and theatrical works, to which the student has access for study. The methods of work in the drawing rooms are approximated to those of an architect's office, and by the end of the second year the student should acquire sufficient knowledge and experience of scale and detail drawing to secure him employment, if he wish it, during the summer vacation.

**A** MADAGASCAR forests company has been established to deal with and bring into use the native timber of Madagascar, and held its first meeting in the course of last month. The enterprise seems at present to be in rather an early and tentative stage, being engaged rather in recommending the timber than in doing any material business in it; but the evidence of some practical correspondents whose letters were read seemed to indicate that Madagascar teak was a timber that deserves more attention than it has hitherto received, in this country at least.

**W**E fear that the Select Committee of the House of Lords, who have passed the preamble of the Richmond Lock Bill, will find when it is too late that they have made a mistake. They are evidently much impressed by the advantage to so beautiful a locality as Richmond of being gifted with a perennially full river; and no doubt Richmond under these circumstances would be one of the most beautiful and attractive portions of the Thames; but we doubt whether the Committee have realised either the extent to which the present condition of the river at Richmond is due to the absorption of water by the Water Companies (a system which is doomed at no very distant date), or the extent to which the tidal river will be likely to be injured by this cutting short of the entry of tidal water. Eminent engineers have given evidence on both sides, it may be said; but it is overlooked that the strongest evidence against the scheme comes from those who are most especially experts as to the treatment of tidal rivers and estuaries. It would be far wiser to take steps to expedite a new scheme for London water-supply, and leave the question of another weir on the Thames till it be seen how far the stoppage of the water companies' drain out of the river will affect its condition for the better, by affording a larger supply of land water.

**W**E are glad to find that the Corporation of Leeds fully recognises the responsibility attaching to its recent acquirement of Kirkstall Abbey. A number of men are hard at work clearing away the rubbish which has for so many years covered a considerable portion of the buildings. The ground to the north and east of the church has been excavated to the depth of 3 or 4 ft., and the base courses along these sides have been laid bare. One wall of a porch, which sheltered the enriched doorway in the westernmost bay of the north wall, has been uncovered, and several small tiles have been unearthed. Part of the east wall of the chapter-house is now visible; it stands a little higher than the base-course, and is a few feet outside the modern wall which forms the present end of

the building. The chapter-house formed part of the original structure erected in the latter half of the twelfth-century, but was extended at the beginning of the fourteenth-century, and the wall now exposed is of the latter date. Excavations have also been made in the refectory, disclosing certain walls not marked on current plans of the abbey; and in the hospitium and other portions of the building a considerable clearance has been effected. Little or nothing has been done in the church, and the stones, which formed a great heap in the nave and north transept when the north-west pier of the central tower gave way in 1779, still remain there. The greater part of the ivy which covered the walls has already been stripped off, and the fine elms which flourished amid the ruins and added so much to their picturesqueness, have been cut down. By the picture-maker, perhaps, the destruction of all this greenery will be contemplated with sorrow, but by architects and archaeologists all steps which are taken to show the ancient buildings more clearly and to preserve them for a longer period will be gladly welcomed. We do not know whether it be contemplated to pull down the modern walling, which has been inserted in the doorways leading from the cloister garth to the refectory, in the east end of the chapter house, between two arches in the abbot's hall, and in other places, but we certainly hope that this will be done, so that at any rate access may be obtained to the various rooms in the way provided by the original builders.

**I**T is proposed to construct a new street in continuation, eastwards, of Tavistock-street, Bedford-square. This thoroughfare will run from Caroline-street to Charlotte-street, passing between Great Russell-street and the southern side of Bedford-square. The slip of ground to be thus let, upon building leases, covers about 59,000 ft. superficial. The improvement will involve, we understand, the destruction of a house on the eastern side of Caroline-street, formerly inhabited by John P. Kemble,—it was No. 13 in his time, and has since been renumbered 12,—and whence he removed to a house, since destroyed, on the northern side of Great Russell-street.

**N**EARLY half of the last number of the "Journal of Hellenic Studies" (vol. xi, No. 1) is devoted to the report by Mr. H. A. Tabbs of the past six years' excavations in Cyprus. No discovery of any great general interest has been made, but the report abounds with details that are important to the specialist. The paper that will probably attract most general attention in the number is that by Mr. Cecil Smith on the Macmillan lekythos. This vase was presented to the British Museum by Mr. Malcolm Macmillan shortly before he started on the expedition to Greece, from which he never returned. Apart from the melancholy interest that attaches to it on this account, the lekythos claims attention as the finest specimen extant of the class known as "Protokorinthian." The beautiful plates that accompany the text are the memorial gift to the Journal of the Macmillan family. In his able paper, Mr. Cecil Smith arrives at two main conclusions, very valuable for the history of early Greek ceramography,—i.e., 1. That the Protokorinthian ware, following shortly after Mykenae, is closely connected with the old Greek Korinthian metal industry, and hence was influenced by the Cypriot-Phoenician metal bowls. 2. The fabrics of Naukratis, Kyrene, and Daphnæ were subject to this Cypriot-Phoenician influence at a later date, and probably in two ways:—Directly, through communication with Cyprus; indirectly, through Korinthian importation. Mr. E. J. Gardner, besides his annual report of the work of the British School at Athens, contributes an interesting paper on the processes of Greek sculpture, as shown by some unfinished statues in Athens, a paper in which he acknowledges the help received

from a practical sculptor, Mr. W. Goscombe John, Gold Medallist (Sculpture) of the Royal Academy. Dr. Chas. Waldstein publishes a small terra-cotta, of interest in relation to the central slab of the east frieze of the Parthenon. It represents a woman carrying a cushioned seat. Dr. Waldstein inclines to agree with a recent conjecture in the *Classical Review*, iii, p. 378, that the two attendants in the slab may be the priestesses called by Istros Trapezo and Kosmo; the terra-cotta may have been buried in the grave of a woman who held the function of Trapezo (table-priestess).

**W**E have received a printed circular in regard to the Penryn (Moelfre) Limestone and Marble Quarry, situated in Traeth Bychan Bay, Anglesey, from which it appears that the stone is about to be more extensively raised, both for building and ornamental purposes, than formerly. The material is, geologically, a Carboniferous limestone on the same horizon as the encrinural or crinoidal marbles of Derbyshire, and of similar character to that quarried and polished near Penmon, about four miles north of Beaumaris. The Carboniferous limestone of Anglesey is exceedingly crystalline, and takes a clean and beautiful polish, and in a small way it has been favourably known for a long time. The prevailing tint is brownish-grey of a fine mottled appearance, with dark spots and veins, but dark brown and black marbles can also be found. The Penryn quarry is practically on the sea-shore, some distance from rail, and the cost of carriage has hitherto handicapped the stone. This is intended to be remedied by forming a dock by cutting a channel about 100 ft. in length out of the solid rock, so as to make it available for coasting vessels and steamers. The building stone has been employed in many important engineering works—notably the Menai Tubular Bridge, where the compact and heavy nature of the material, and large size of the blocks available, proves its utility on this head. Moreover, the stone is very durable,—all such highly crystalline limestones are; but the sombre aspect of the whole when built up, together with the refractory nature of the material, hardly renders it suitable for the better class of buildings, especially, where fine mouldings are required. It makes a good serviceable marble, however, and herein consists its chief value.

**T**HE recommendation of the Committee of the House of Lords on the "Removal of Gates" Bill, to the effect that no compensation is necessary, but that portions of streets which would now experience a new traffic nuisance should be laid with wood pavement, is a very lame and impotent conclusion to what had been previously urged in the House of Lords on the subject, and to the admissions made by Lord Salisbury. It was shown in evidence that some of these gates had been in existence in the same positions as private gates on the Duke of Bedford's estate for centuries; it was stated plainly in evidence by the Duke of Bedford's solicitor, who had the letting of all the property in question, that its letting value would be seriously depreciated by their removal; there is no pretence that the maintenance of these gates up to the present time has been illegal; but now an Act is to be passed to compulsorily remove them without any compensation to those whose interests are undoubtedly affected by their removal. This is sheer confiscation. We have long been of opinion that the gates, in the interests of the general public, ought to be removed; but to remove them without any compensation to the minority who are thereby injured is such a manifest piece of injustice that we can hardly yet believe that this course can finally be allowed to be taken.

**RIVERSIDE INNS.**—The *Art Journal* for August has an article on "Riverside Inns," the illustrations to which show some most interesting bits of picturesque old buildings.



## LETTER FROM PARIS.

A GREAT impression was produced in Paris by the recent death of Sir Richard Wallace, who had gained a reputation here not only as an amateur of art and a collector, but as a public benefactor and a faithful friend to Paris in her worst troubles, for he elected to remain here all through the siege, and organised an ambulance corps which was very well worked and was very useful. Since that sad epoch, he further showed his generosity in the gift to the City of the fifty bronze drinking-fountains which bear his name, and which have been such a boon to the artisan class of Paris. These fountains, cast in bronze, have a small octagonal base above which is a square pedestal decorated with reversed consoles, and above this four caryatide figures supporting a small dome, from the centre of which pours continually a small thread of water, to be collected in a cup when required\* by a passer-by. The design for these fountains was by M. le Bourg, a sculptor of considerable talent.

It was in the "Château de Bagatelle," in the Bois de Boulogne, that Sir Richard Wallace died. This is a charming house, formerly called the "Folie d'Artois," and built by the brother of Louis XVI., who became afterwards Charles X. The property was sold during the Revolution and transformed into a concert-garden. The events of 1815 caused its restoration to the Comte d'Artois, who gave it to his son, the Duc de Berry. The park is one of the pleasantest promenades in the environs of Paris, facing Suresnes and Mont Valérien. The Château de Bagatelle lastly fell in right of succession to the heir of the Marquis of Hertford, whose monument is to be seen in Père la Chaise, close to those of General Foy and Béranger. It is a heavy and massive construction in ashlar, terminating in five steps, making a kind of pyramidal finish. In the interior, in a sort of chapel, is seen a bronze bust of the Marquis of Hertford.

At the cemetery of Mont Parnasse, it may be mentioned, there is talk of restoring the memorial to Admiral Dumont d'Orville. The tomb of this celebrated navigator, which was designed by Constant Dufeux, was in a state which threatened ruin, and a committee of architects, presided over by M. Chas. Garnier, has been appointed to carry out the necessary work for putting the monument in a state of repair.

All who know the École des Beaux-Arts have admired, in the Cour du Mûrier, the fine figure of "La Jeunesse" by Chapu, which stretches out the palm-branch towards the bust of Henri Regnault. In addition to this monument, erected in a general sense to the memory of the pupils of the École des Beaux-Arts who fell in the war, a very simple monument has just been placed in the École, specially dedicated to Regnault, who fell fighting bravely at Buzenval on the 22nd of January, 1871. It is a plaque in black marble on which is fixed a mask in bronze of the painter, accompanied by branches of palm and of oak, also in bronze. A reproduction of this monument has been placed at the Villa Medici.

Another new monument, to be inaugurated in September, is that to Eugène Delacroix, the figures for which are just being cast in bronze by the *cire perdue* process.

The models and cartoons for a portion of the proposed further decoration of the Panthéon have been put up in their places in the building to enable the Committee the better to judge of the effect. The statue of Mirabeau by M. Injalbert has been approved without discussion, but that of Victor Hugo, by M. Rodin, is pronounced deficient in height and amplitude of style, and he has been requested to submit another model more in harmony with the general scheme of decoration. The Committee has been equally unfavourable to the "Triumph of the Republic," which was to decorate the choir, the central figure of which rises above the cornice, and even hides a portion of the mosaic recently executed after the cartoons of M. Hébert. The new models will soon be put in their places in order to judge of the effect of the modifications, and also the models of the sculptural designs intended to mask the bases of the four main piers of the cathedral.

The "Service des Bâtiments Civils et des

Palais Nationaux," which has passed through many vicissitudes, has just undergone a new transformation. Created by the National Convention and incorporated with the Ministry of Public Works, it was transferred, under the Empire, to the "Ministère d'Etat." It passed thence to the control of the "Ministère de la Maison de l'Empereur," then to that of the Beaux-Arts, and finally, it has been reorganised under the control of the "Ministère des Travaux Publics." As the faults of the department arise from its own defective organisation, it is hardly supposed that this new transformation will effect any change for the better. It recalls the remark of a lord of Naples who was always altering the uniform of his soldiers,—"Dress them in green, red, yellow, or blue, they run away all the same."

The receipts of the two Salons of this year prove that this double event stimulated public curiosity, since the joint receipts of the two exhibitions were 410,000 francs (240,000 for the old Salon and 170,000 for the new), while in 1888 the takings of the Palais d'Industrie Salon only amounted to 320,000 francs. The effect, however, has been to reduce the amount of funds available for the charitable foundations of the Société des Artistes Français (the old Salon). This is only one of the regrettable results of the schism; and in the discourses delivered on the occasion of the distribution of the "récompenses" in connexion with the Palais d'Industrie Exhibition, the various official orators vainly implored the adoption of a peace policy; and vainly also did the Ministère des Beaux-Arts preach conciliation and offer its services as arbitrator. These attempts were made, it is feared, with no success. The venerable M. Bailly has used all his efforts in this direction; but M. Bouguereau still sulks, and M. Meissonier, like Achilles, withdraws himself to his tent. It is even said that he has made a formal demand for a perpetual use of the Palais des Beaux-Arts for the exhibition of his Society, a request which, if made, seems to indicate a determination to a complete and permanent rupture.

The Palais des Arts Libéraux, opposite, is to form the home of a permanent exhibition for the inhabitants of Grenelle, and will also include a salle de conference and a salle des fêtes. The exhibitions of ethnography and social economy will also be installed there. The central dome and the 30-metre gallery will form a public promenade. The Galerie des Machines will be levelled and covered with sand, in readiness to serve for exhibitions of horticulture, agriculture, horse-shows, &c. The cafes and brasseries of the Exhibition will nearly all be re-installed in their former positions. Such are the present arrangements of M. Alphand, which will probably have at all events the effect of giving life and animation to a quarter of Paris which before the Exhibition was comparatively deserted.

The fête of July 14 offered nothing of special interest. As usual, it was made the occasion for an abundant distribution of decorations; but this year the Arts have not obtained a great proportion of those red ribbons. We can only mention, among the new chevaliers, the painters Chartreau and Schommer, and the sculptors Roulleau and Zacharie Astruc. The latter, it should be mentioned, is also a very talented water-colour artist. The same ceremony has also been made the occasion of distributing to the engineers, foremen, and workmen who were engaged on the Eiffel Tower a very badly-designed medal voted by the Municipal Council, which passed over all the renowned and first-class medalists of Paris, and gave the work to an artist of little repute, who has turned out a failure.

After having presented France with an ungainly and pretty-nearly useless edifice, M. Eiffel has recently been occupying himself about the important subject of the proposed Metropolitan railway. The Conseil Général des Ponts et Chaussées has voted for the project, the concession for which has been demanded by M. Eiffel, and if the results of the negotiations on this point are satisfactory, M. Yves Guyot will shortly present to the Chambers a "projet de loi" to authorise the construction of the line. M. Eiffel will certainly in this case have earned the gratitude of the Parisian public, who are exceedingly anxious for the construction of the railway.

Among works in progress, there is again repair to be done to the Pont Neuf. This time it is to strengthen the four arches of the right bank, the piling of which is decayed. There is

also the demolition of the Lycée Louis le Grand, which has been taken in hand during the vacation period. New buildings of a solid and monumental character have been raised to take the place of the old buildings founded in 1560 by Guillaume Duprat, under the name of the Collège de Clermont. Lastly, in Rue des Recollets, the municipal administration have inaugurated a disinfecting establishment for all objects which have been connected with or in use by persons suffering from contagious diseases. This building has been constructed from the designs and under the superintendence of M. Bouvard. The destruction of disease-germs is carried on in a hermetically-sealed cylinder, by means of steam under high pressure.

We may mention also the construction at the Gare du Nord of a large buffet with an important staircase, intended for the use of travellers arriving from England, Belgium, Holland, Germany, and Russia, who can under the new railway arrangements proceed to Spain, Switzerland, or Italy, without having to traverse Paris between one terminus and another.

The works of re-arrangement recently carried on at the Louvre have led to the discovery of the fragments of a splendid mosaic brought from Asia in 1860 by M. Renan, and which up to the present moment had been entirely forgotten. M. Guillaume, as architect in charge of the Louvre, is going to arrange for the exhibition of this curious specimen of Assyrian art in one of the galleries of the museum.

The Direction des Beaux-Arts has put up for competition, for the year 1890, the Prix de Sèvres, which is awarded every two years. The subject this year is a table-service and a dessert-service. The models are to be deposited at the École des Beaux-Arts on the first of October.

The Académie des Beaux-Arts has announced the results of the competition in painting for the Prix de Rome. The first grand prix has been awarded to M. Devamber, pupil of MM. Quay, Jules Lefebvre, Boulanger, and Benjamin Constant; second prizes have been awarded to M. C. A. Lenoir (pupil of MM. Bouguereau and Tony-Robert Fleury) and to M. G. A. Lavergne (pupil of M. Lévy); but it must be confessed that the works exhibited in the competition are by no means of a high order of merit; the best appears to us to be that of M. Lavalley, which, however, obtained no mention at all; he received the second grand prix last year.

The results in the sculpture competition have been much more satisfactory. The grand prix has been awarded to M. Gasq, pupil of MM. Joffroy, Falguère, and Mercier; the second to M. Belloc, pupil of MM. Dumont, Bonissieux, Thomas, and Mercier, and an additional second prize to M. Sicard, pupil of M. Cavalier. The subject given was "The Death of the Spartan Othryades, the conqueror of the Argives." The work of M. Gasq is a very remarkable one in conception, and very ably modelled; the latter praise may equally be given to the work of M. Belloc, which, however, is rather deficient in expression. On the other hand, that of M. Sicard exhibits a remarkable degree of life and vivacity.

The decoration of the Hôtel de Ville certainly seems to bring misfortune to the painters selected to take part in it. After losing Cabanel, Laville, Rapin, and Hanoteau, we have now to register the death of Charles Lapostolle, who had been commissioned to paint a landscape panel in the Salon des Arts. He was a much esteemed marine painter; one of his pictures figures in the Luxembourg. He received medals in the Salons of 1870 and 1883, and a silver medal in the 1889 universal exhibition. He died in his sixtieth year. We also regret to have to announce the sudden death last week, at the age of forty-nine, of the sculptor Jean Gauthier. He was born in Le Morvan, and commenced life as a shepherd; but showed at an early age such decided artistic talent that he was sent to Paris, where he worked in the atelier of Dumont and at the École des Beaux Arts. In 1867 he obtained a first medal with a splendid figure of Narcissus. He had a very uphill fight in the early part of his career, and it was not before 1876 that he was able to create such works as his "St. Sebastian," "Clotilde de Surville," and "Le Paradis Perdu," the latter exhibited in 1878 and purchased by the city authorities of Paris, who have placed it in the Parc Monceau.

Among Gauthier's works may be mentioned also "La Ville de Paris," which forms the decoration of the clock tower of the Hôtel de Ville;

\* One of these fountains was a conspicuous object in the Ville de Paris pavilion in the 1889 Exhibition. The continuous pour of even so small a stream of water means, of course, an appreciable amount of waste, but this method of supply has the advantage of aerating the water and keeping it exceedingly cool.—Ed.



"Diderot," which is to be found on the "Place St. Germain des Prés," the bust of "La République" which has become the official effigy decorating most of the public edifices of France, and the statue exhibited at the Salon this year, entitled "Avant l'orage," which was noticed in our review of "Some Sculpture of the Year" (see *Builder* for May 31 last, p. 389). The untimely death of this able artist in the full tide of life and work, and before he had fully taken the measure of his own capabilities, is an irreparable loss to French art.

#### COMPETITION FOR THE NEW INFIRMARY, HALIFAX.

THE necessity for more extended infirmary accommodation for Halifax and the surrounding district having increased steadily for some time past, the Committee decided upon the erection of new buildings, and limited the competition which has recently been decided to five firms of architects, each of which received an honorarium of 100*l.*, with the exception of the firm selected to erect the building.

The designs submitted by Messrs. Worthington & Elgood, and Messrs. Mills & Murgatroyd, of Manchester; Messrs. Horsfall & Williams, and Messrs. Utley & Gray, of Halifax; and Messrs. Young & Hall, of London, all carry out the conditions in a careful manner, and are now on exhibition in the Assembly-rooms, in the Harrison-road, and form an interesting collection.

The conditions and instructions issued to architects by the Committee were explicit and carefully prepared, and called for the provision in the designs of sixteen pavilions of one storey in height, which should contain a ward of twenty beds and a separate ward of two beds, with nurses' duty-room and the necessary ward offices and accommodation. In addition, two pavilions for isolating patients in small wards were required, as well as a separate pavilion for the treatment of infectious cases. A nurses' house was also asked for.

The site for the new buildings is on the outskirts of the town, and of irregular quadrangular shape, bounded on the south and one long side by Free School-lane, and with the two short sides abutting on Clover Hill-road and New South-road respectively.

The difference of level in the length of the site, amounting to upwards of 60 feet, added somewhat to the difficulties of conveniently planning the building.

The Committee, who were well advised in calling upon Mr. Waterhouse to help them in assessing the merits of the designs, have selected the designs of Messrs. Worthington & Elgood, and will be supported in their decision by all who carefully compare the drawings. Messrs. Worthington & Elgood place their administrative block in the centre of the Free School-lane frontage, and form a terrace to give a level approach to the front entrance.

From the centre of the administrative block, the main corridor, which is straight, runs east and west from end to end of the site, so to speak; and the ward pavilions branch from the corridor north and south. At the lower end of the corridor is placed the nurses' houses, facing New South-road, whilst the infectious ward, which cannot be removed too far from the latter, occupies a position at the opposite end facing Clover Hill-road, but is nevertheless set well back from this thoroughfare. The isolation wards occupy a convenient position adjacent to the administrative block, and east and west of it, but on the north side of the corridor.

A separate carriage entrance with a lodge is placed in the north-east corner of the site in the New South-road, and gives access to the back of the administrative block where the casualty wards and waiting-rooms for patients are placed. It also leads to the laundry, the boiler-house, engineer's cottage, mortuary, and post-mortem rooms, which are behind the administrative block and against the back boundary of the site.

In contrast to the overcrowded aspect of the plans of some of the other designs, the buildings are well placed on the site, and leave a fair proportion of open space, which has been partly utilised for the provision of tennis lawns at the west for the officials, and at the east end for the nurses.

Special points in this set of designs are the system of ventilating cross passages between wards and offices, the provision of a sun-room and balcony at the end of each large ward, and

the distance between the nurses' house and the infectious-ward.

Turning to one of the ward pavilions for more careful examination, we find a short corridor for cross-ventilation leading at right angles from the main corridor, on the right of which is placed the coal places, with the nurses' water-closet, &c., on the opposite side. These are then cut off by another cross-ventilating passage with windows at each end. The corridor then runs direct to the twenty-bed ward, but on the right are placed splint and linen rooms and pantry, whilst the nurses' duty-room adjoins and overlooks the large ward. On the other side of the corridor is a two-bed ward with a room for patients' clothes adjoining; a passage from the ward also leads to the ventilating-passage already mentioned. Owing to the existence of this passage, we think the position of the nurses' water-closet would be improved if it were placed on the side of the corridor opposite to and away from the two-bed ward.

The large ward accommodates twenty beds, ten on each side. Windows are placed on both sides of every bed; the end bed is kept away from the walls, and a small window inserted in accordance with the accepted theory of ventilation for this position. Swing-doors shut off the ward at either end, with steam radiators on each side, in addition to the one in the centre of the ward. Two double fireplaces, with ventilating grates, are provided for each ward. The ceilings of the wards have a semi-elliptical form.

The opposite end of this ward opens into a cross-ventilating passage, with a sun-room and balcony beyond for the use of patients. One side is occupied by the bath-room and lavatory, and the other by the sink, two water-closets, urinal, &c.

The isolation pavilions, with their small one or two-bed wards, are necessarily treated in a different way; they are entered by a small cross-ventilated passage from the main corridor, a cross-ventilated space divides the coats and water-closets from the nurses' duty-room, and the pantry on the left side of the corridor with the brushes, linen, splints, and patients' clothes rooms opposite. Another ventilating cross-passage then divides the nurses' portion from the wards. The wards are placed on one side only of a well-lighted corridor, and are ranged thus: a two-bed ward, then two one-bed wards, then a cross-ventilating passage; the wards then repeat with the cross-ventilating passage dividing the wards from the bath-room placed at the end of the pavilion, with men and women's water-closets, sink, and lavatory, arranged on either side.

The infectious pavilion differs again from the isolation pavilion. The wards are ranged on one side only of the corridor, over which they are lighted and ventilated. The pavilion is divided by a central cross ventilating passage into two blocks, each block containing two two-bed wards, with a nurses' duty-room placed between and overlooking both wards. Two bedrooms for nurses, each with two beds, are placed near the entrance. The other offices correspond with the bath-rooms, &c., placed at the end of the isolation wards.

The nurses' house is entered at the first-floor level from the main corridor. It comprises a series of rooms grouped round a central space with glazed roof, which will provide the nurses with an excellent recreation-hall, into which the corridors on each floor will open. Convenient suggestions for future extensions have also been made.

The designs submitted by Messrs. Horsfall & Williams differ materially from all the others. The administration block plan in the middle of the Free School-lane frontage occupies the centre of a corridor forming an arc of a circle extending from the south-west to the south-east corners. The wards open out of this corridor in radiating lines.

The nurses' house at the south-west corner occupies a position at the elevated end of the site. The infectious pavilion is in the north-west corner, and connected with the main corridor by a separate corridor running between two wards.

The wards on the left hand are intended for female, and those on the other side for male patients.

The openings to the large wards in this design are not placed opposite one another in the main corridor, as they are in all the other designs. The corridors for cross-ventilation between the wards and offices are not so conveniently arranged as could be wished, and the

nurses' rooms are shown in most cases without windows overlooking the ward. It is difficult to believe that the circular arrangement of this plan would be an artistic success.

The basement of the building has been enclosed to a great extent by unnecessary walling, and the small openings shown have not been left entirely open.

The isolation wards differ from the large wards entirely in arrangement. The position of the water-closet is inconveniently distant from the wards, and little is gained by the circular treatment of the offices and nurses' bedroom.

Messrs. Young & Hall's designs show the administration block in the centre, with laundry and offices at the back connected by a covered way. The straight corridor runs east and west, and the isolation blocks adjoin the administration block.

The position of the infectious ward at the lower end of the site cannot, however, be considered good, as the distance between nurses' house and the infectious ward cannot be too great; but of the two we think there is no doubt that the higher position of the site should be occupied by the ward.

The isolation wards are arranged on one side of a corridor, with the duty room and offices on the other; the water-closets are projected at right-angles to the corridor on each side, an arrangement which detracts considerably from the compactness of the plan.

The duty room adjoining the large wards has no window overlooking the ward shown, and the lavatories at the end are placed in separate blocks, and connected by short diagonal lobbies at the corners of the ward. A large balcony occupies the space between.

The pavilions facing the north have balconies on the west side. The bath and other rooms have been placed in one block, and join the ward by a short corridor for cross ventilation. In the infectious block the two bed wards are placed on each side of a duty room, without overlooking windows and with the nurses' bedrooms on the other side of a corridor. The bath room appears to be too far away.

Messrs. Utley & Gray in their design show entrances in Free School-lane and New South-road, and a carriage-drive around the site. The administrative block occupies the centre of the site, and a straight corridor leads away in each direction. In this design, the nurses' house and the infectious pavilion have been placed at the west end of the site. Both in the isolation and large wards, some additional cross-ventilating passages would have been a great advantage.

Messrs. Mills & Murgatroyd have confined themselves to one entrance only in the New South-road, and have carried carriage-drives round to the back and front of the administrative block. We should prefer to have seen the water-closets more completely cut off by passages ventilated at each end, both in the large wards and the isolation wards, and the windows in the former appear to be much too small. In this design the nurses' house and the infectious ward are both placed at the upper end, and though there is considerable space between the two buildings, it has only been accomplished by placing this ward almost against the boundary of Clover-hill-road.

A somewhat novel arrangement has been suggested for dealing with the considerable slope of the corridors, by dividing the width into two, one portion being a continuous slope, the other having steps at intervals for foot-passengers. Such an arrangement would have many inconveniences, and inevitably necessitate the doubling of the width of the corridor. The basement openings are too small to permit efficient ventilation.

The styles of architecture chosen by the competitors were either Elizabethan or later Renaissance, the architectural treatment being confined mostly to the administration block and the nurses' house. Messrs. Worthington & Elgood's treatment of their elevations is of a quiet and dignified character, suited to its purpose.

The expressed intention of the Committee is to build only a portion of the wards at present. They will doubtless be well advised in the matter, but we hope that funds will allow them to build at once the administration block, the nurses' house, and the whole of the wards facing the Free School-lane. This will render the front of the buildings architecturally complete, and the wards for future requirement can be added at the back.

The south aspect should certainly be given to the wards to be erected immediately.



## THE KENT ARCHEOLOGICAL SOCIETY.

THE annual meeting of the Kent Archaeological Society was held on Monday and Tuesday, July 21 and 22, the headquarters being at Canterbury. From an early hour members and their friends began to assemble, and the fineness of the weather and an attractive programme caused the attendance to be the largest that has yet been recorded.

The proceedings opened by a preliminary meeting for the transaction of business, under the presidency of Earl Stanhope, who occupied the chair. By permission of the Rev. T. G. Crosse, the meeting was held in Eastbridge House. The ancient building was a congenial place for the assembly of an antiquarian society, and an admirable opportunity was thus afforded for the inspection of its curious admixture of very Early work with Later Gothic. After the election of new members, &c., the party, by this time greatly increased, proceeded to the Cathedral, where several hours were spent in the examination of the fabric, and also of the many interesting buildings adjoining to it not ordinarily seen.

The numbers being so considerable, it was found necessary to divide them into three or four parties, and under the escort of the Dean, the Rev. Canon Scott-Robertson, and Dr. Sheppard, &c., the inspection was made in great comfort.

In the crypt the western wall had been further excavated to allow of its inspection. It proves to be of solid masonry put together with hard mortar, and sometimes forming no portion either of the work of the oldest Norman builder, Lanfranc, or of his building successor, Ernulf.

The opinion most generally expressed was that the work is of Roman date. In the Chapter Library, the whole of the objects, the crozier, the chalice, &c., recently found in opening an uninscribed monument in the south aisle of the Presbytery, were laid out for the inspection of the parties. The discovery of this interment, as our readers know, has caused a considerable amount of interest and discussion, and it is now pretty conclusively determined that the interment is that of Archbishop Hubert Walter, 1205. The chalice, a cup circular in plan, has elaborate and beautiful workmanship of a design which looks earlier than this date, accounted for probably by the supposition that an old chalice was buried with the Archbishop. The privilege of close inspection of the remains was greatly appreciated. Much of the textile work bears Eastern patterns, and was most probably imported from abroad. The articles have been removed with great care from the human remains which still repose within the curious shrine-like monument well known to visitors, and which had never previously been supposed to contain an interment. In the Chapter-House one bay of the dilapidated ceiling has been restored to its pristine beauty, and the spectators could form, in consequence, some idea of the original aspect of this stately room.

The party then proceeded to the ruins of the little church of St. Pancras, which stand partly in the grounds of the Kent and Canterbury Hospital. Here the Rev. Canon Routledge acted as guide, and pointed out that the walls, which in some places rise only to the level of the turf, are of Roman workmanship and material. The highest portion, which rises to a height of 8 or 9 ft., was visible before the excavations made a few years ago, and has always been recognised as of Roman date, constructed wholly of flat tile-like bricks, but its connexion with the church, of nearly similar work, has only been revealed by the explorations. The east gable of the chancel is of 14th century date, and has superseded the original apse. The Church of St. Martin is close to St. Pancras, and it was next inspected. Canon Routledge pointed out here also that the walls of the nave and chancel were of Roman workmanship, and referred to his recent discovery of a return eastern wall to the chancel about midway in the present length, showing that the Roman chancel had been only about half the length of the present extended fabric. Mr. Loftus Brock, F.S.A., pointed out that the south wall of the nave still retain a coating of plaster formed of pounded Roman brick which extends almost up to the eaves. These evidences of the existence of Roman churches were scanned with no small interest, and they were referred to at length at the evening meeting held in the crypt beneath the library of St. Augustine's College, where a

paper was read by Canon Routledge on "Roman Churches in Canterbury."

This paper contained the notices given by the Venerable Bede of the existence of a ruined Roman church on the site of the cathedral, of the existence of St. Martin's in Roman times, and of a pagan temple where St. Pancras now stands. Mr. Loftus Brock followed in the same direction, pointing out that it was but reasonable to suppose that Christianity was prevalent in Britain in late Roman times, since it was the State religion here for about one hundred years before the Romans left our shores; and since it was so in Gaul.

A second paper was read by the Rev. Canon Scott-Robertson on the burial-places of all the archbishops, a paper of considerable research. This was followed by a communication with respect to the walls of Canterbury, from Mr. C. Roach Smith, F.S.A., read by the hon. secretary, Mr. Geo. Payne, F.S.A., and by a report from Mr. Geo. Dowker, of the discovery of a portion of what is probably a Roman villa in the grounds of a school at Canterbury.

In the interval before the evening meeting, a public dinner had been partaken of in the Music Hall, under the presidency of Earl Stanhope, after which, in proposing the health of the Mayor, thanks were rendered to him for having, at his own expense, repaired the tower of the ruined church in Burgate, to prevent its removal, after it had been damaged by a recent storm. The very agreeable office was rendered by the President of presenting to Canon Scott-Robertson a massive silver bowl which had been voted to him by the Council, on his resignation of the office of honorary secretary, an office which he has held for a great many years. He will still continue to edit the journal of the society.

Tuesday, the 22nd, was another day of brilliant sunshine, and the party filled a large number of carriages and breaks, which formed a long procession through the quiet roads along which the journey lay. The first stopping-place was at Chartham Church, where, after the party had been welcomed by the rector, the Rev. Cyril Randolph, Mr. Loftus Brock rendered a description of the fabric. It is a large church, consisting of a Late western tower, nave, transepts, and chancel, the ridges of the roofs being of equal height, and the roofs being of ancient oak. The principal interest centres in the elaborate windows of the chancel, fitted with the peculiar tracery known as "Kentish," and which Mr. Brock traced to the same architect as had erected the large window of St. Anslem's Chapel in the Cathedral, which dates from 1336. The windows are filled with stained glass, restored to its original design a few years ago, under the direction of the late Sir E. Street, under whose care the church was brought to its present appearance.

The celebrated brass, Sir R. de Septvans, 1306, and the other curious brasses were seen as well as could be under the circumstances, there being hardly standing room in the church for the party. Proceeding along the valley of the Stour, the carriages stopped at Chilham Church, where Canon Scott-Robertson acted as *cicerone*. The church is of large size, with small transepts, a porch with a parvise over, and a characteristic western tower, the whole, except the rebuilt chancel and aisles, being of fifteenth century work of plain character. The church contains many curious monuments, the epitaphs of many being of great length and written in flowery style. Sir Dudley Digges, Knight, "whose death the wisest men do reckon amongst ye public calamities of these times," &c., 1633, is an elaborate composition of four sitting female virtues, with a marble column in the centre. A fine group by Chantry, 1822, to the memory of J. B. Wildman, deserved all the admiration it received. But the principal interest in the monuments is probably deserved by the style of two of them. These are formed of polished Bethersden marble, upon which elaborate designs were traced, the ground being then chiselled to a rough surface. The effect of the polished portions in contrast to the unpolished parts is very good. Both of these monuments date from the earlier part of the seventeenth century, and are worthy of careful study as examples of decorative effect.

Across the green of the beautiful village of Chilham is the entrance to the castle, to which the party proceeded, on the invitation of C. Stewart Hardy, Esq., J.P., the present owner. The mansion has had new stonework windows inserted in recent years, but the entrance is original, and it still bears the pious motto,

"The Lord is my house of defence and my castle, 1616." The keep of the old Norman castle is very carefully preserved, and from its position on a high mound it is a conspicuous object in the landscape. A large flag waved above its roof, and another on the church tower to welcome the party. Some excavations which have recently been made were pointed out by Mr. Geo. Payne. They reveal the existence of very ancient foundations.

Godmersham Church was next visited, and described by Canon Scott-Robertson. It is a Norman building with a tower on the north side at the commencement of the chancel, and from its eastern wall opens a semi-circular apse, vaulted in stone. The old court house adjoining contains an elaborate thirteenth-century window of great height, under a trefoil head, originally of two lights.

Traversing beautiful country, apparently but little known to most of the party, a brief visit was made to the church at Waltham, leaving the church of Petham on the left, and, finally, Canterbury was reached soon after six o'clock.

## THE ARCHITECTURAL ASSOCIATION EXCURSION.

WE have received the programme of the twenty-first annual excursion of this Association, which will be made to Oxford and neighbourhood, under the general guidance of Mr. Leonard Stokes, F.R.I.B.A., the President, in the week commencing Monday, August 11, and terminating on Saturday, August 16. The headquarters of the excursion will be at the "Mitre Hotel." On Tuesday, August 12, visits will be made to Ilfley, Dorchester, and Ewelme. On Wednesday, the 13th, the excursionists will visit Stanton Harcourt, Witney, and Cogges. On Thursday, the 14th, Witney, Minster Lovel, and Burford will be visited. On Friday, the 15th, the party will proceed to Woodstock and Benheim, Kidlington and Water Eaton. The hon. secretary is Mr. H. D. Seales-Wood, 157, Wool-exchange, E.C.

## BRISTOL AND GLOUCESTERSHIRE ARCHEOLOGICAL SOCIETY.

THE annual meeting of this Society was held last week, commencing on the 22nd and terminating on the 25th ult., thus occupying four days. The opening meeting was held in Bristol, where the members were received at the Guildhall by the Mayor (in the "Criminal Court," as the *Bristol Times and Mirror* is careful to inform us; that, however, was a circumstance devoid of any more sinister significance than that the Bristol municipal buildings are not quite so commodious as the Mayor could wish).

The Rev. W. Bazeley, the general secretary, presented the report, which showed that there were 467 members in the society; that the income for the year ended April 21, 1890, was £784, of which £567 had been expended, and there remained an accumulated balance of £217, against £244 in April, 1889. Besides this, there was an invested capital of £432, representing the contributions of life members.

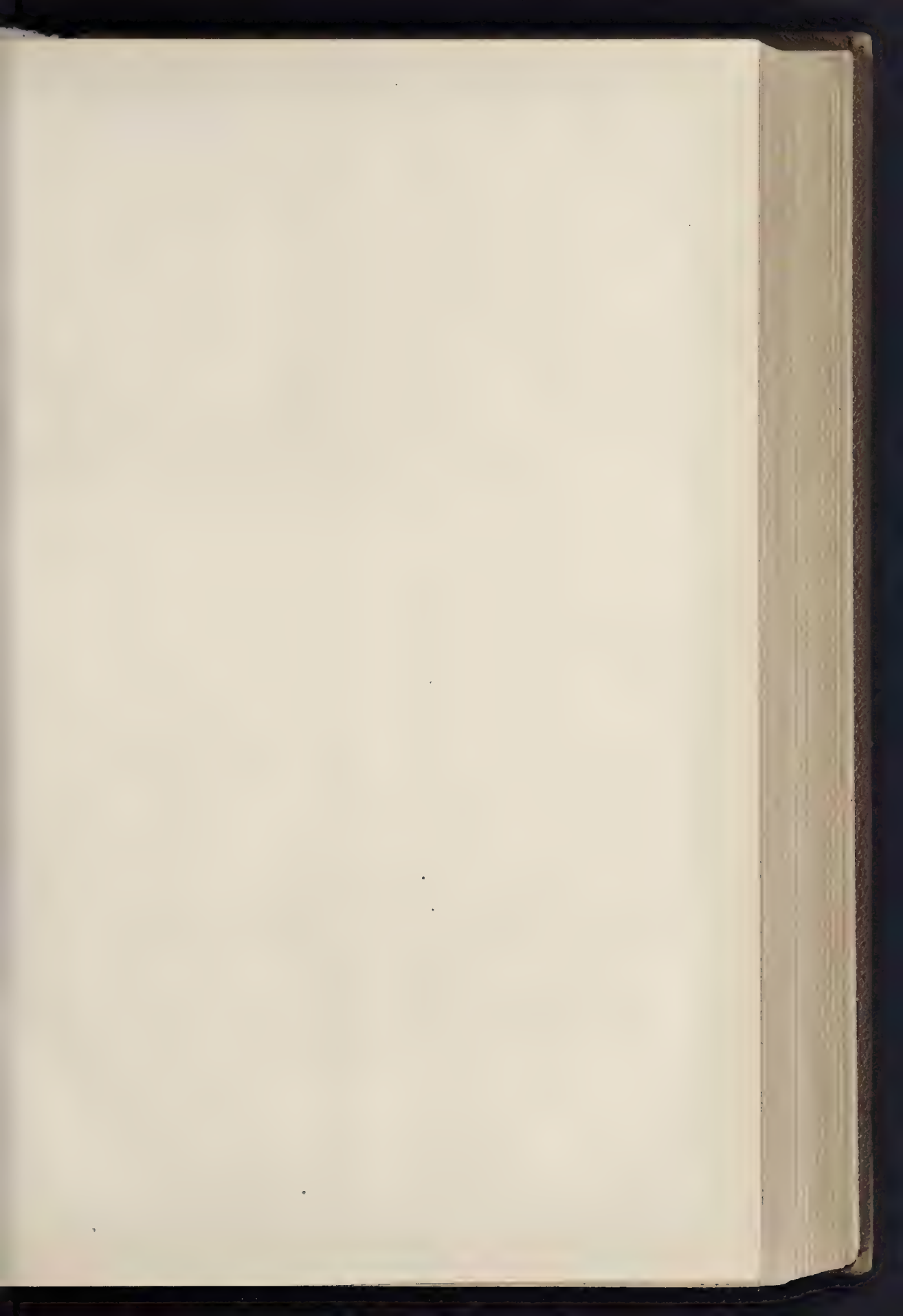
Sir Brook Kay moved, and Mr. A. E. Hudd seconded, that the report be received and adopted.

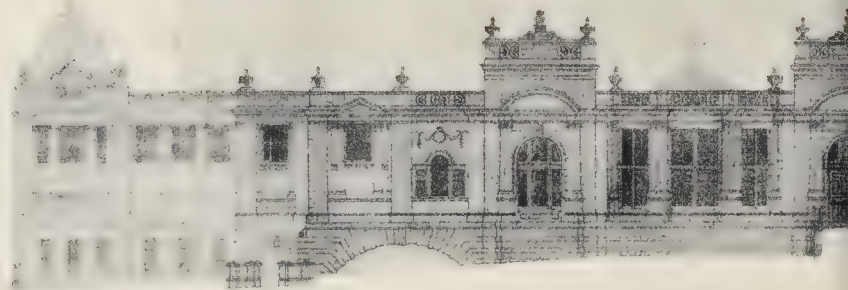
Retiring members of the committee were re-elected.

Sir Brook Kay, who occupied the chair, announced that Mr. J. T. Agg-Gardner, M.P., was unable to be present owing to Parliamentary duties and other engagements.

Dr. Beddoe, the President for the ensuing year, was then introduced, and after a few prefatory remarks, he proceeded to read a paper entitled "An Apology for Archaeology." He said that their science had been the butt of many a satire, and of much obloquy generally, at the hands of Philistines incapable of appreciating its scope and tendencies; but sometimes at those of superior men, themselves pastmasters therein, but who had seen it from the humorous side. Who had ever better depicted the antiquarian than Sir Walter Scott himself, who, with kindly humour, dissected the antiquarian for them, as Isaac Walton depicted the worm, as if he loved him; or Robert Burns, who told them of his friend Captain Gross's collection? He had spoken of their serious and deadly foes the sordid Philistines, who called themselves practical men, who recognised no benefit that was not immediate, visible, and material. Of such a temper generally







Elevation to

500 feet above datum



Elevation to





Bellier Road



Crescent Road





were the men who, for some small or fancied advantage, or it might be in mere ignorance or want of thought, destroyed the vestiges of ancient society—camps and barrows and standing stones, and the sepulchral monuments of past generations. He hesitated to include the too hastily zealous restorers of churches; yet in that department mischief was not seldom done with good intent, and the perpetrators thereof allied themselves to their Philistine foes through their narrowness of view. Next came the despisers of small things—men willing to accept and capable of understanding and utilising the great facts and broad generalisations of social and political history, but who did not understand the necessity of careful and minute labour in collecting the material and laying the foundations of the edifices which they did not disdain to inhabit or build. But there was work for all. Let the architect not despise, but rather encourage, the brickmaker; and let the philosopher—as did, for example, Herbert Spencer—respect the industry and acknowledge the usefulness of the obscure collector of facts—facts, by the way, which, in their own region of archaeology, would in many cases perish utterly and remain fruitless if not speedily gathered and recorded. Archaeology furnished one of the foundations of patriotism by interesting them in the progress of their own country. Surely they had one of the strongest possible motives for its cultivation. Was it not partly from a recognition, more or less conscious, of this fact that their cousins the Americans, and their nephews the Australians, sighed for antiquities? The latter, indeed, possessed none; but the former were beginning to cherish the comparatively few they possessed with an extraordinary affection. The French endeavoured to stimulate this feeling, among other methods, by keeping in the view of their people all that might remind them of their country's history and illustrious men. Thus, at the corner of every other street one saw the name of some former benefactor or champion of France, or of some memorable event in her national life; but for any indication of this kind our country, mother of heroes as she had been, might never have had any admiral except Nelson, or any general except Wellington. They might have a few smoky statues, indeed, and there was a Rodney-place in Clifton; but where was there a Olive-street or a Havelock-square—or where were Milton, Locke, Newton, Lyell, Faraday, or Darwin similarly commemorated? One of the finest and most pathetically eloquent of their British military monuments, erected by Draper and sung by Chatterton, adorned the eastern end of Clifton Down, but a few years ago it came within an ace of destruction. Let them rejoice, then, in the recent action of the Clifton Antiquarian Club, who were beginning to indicate by tablets the houses connected with their Bristol worthies; one already pointed out Southey's birthplace.

The Rev. A. E. Fuller followed with a paper on "Cirencester Castle."

The members then proceeded to the Mayor's Chapel, where Mr. W. R. Barker read a paper on the interesting monuments therein contained.

The Cathedral was next visited, and here the Ven. Archdeacon Norris gave a brief history of the building of the Abbey church. He said that in the early accounts of that building numerous references were made to Abbot Newland's Chronicle, which existed up to the year 1820, when it was mislaid, and it was thought to be lost. He (the Archdeacon), however, believed otherwise, and for eight years tried to induce Sir John Maclean to search for it among the muniments at Berkeley Castle. About two months since Mr. I. H. Jeayes, assistant in the department of MSS. in the British Museum, went to Berkeley, and, acting on the suggestion of Sir John Maclean and himself, Mr. Jeayes searched for and re-discovered Abbot Newland's Chronicle, a transcript of which had since been published. This chronicle explained many difficulties which formerly existed respecting the building of the Abbey church.

In the evening the members attended a *convocation* at the Fine Arts Academy, where, during the evening, Mr. James Baker, F.R.G.S., read a paper on "A Medieval Pompeii of Bohemia," which he illustrated with landscape sketches in water-colour, and two figure studies, with tracings, by Mr. Walter Crane. The paper dealt in a chaty way with a visit on the part of the author to the old town of Tabor, where Mr. Baker and his friends heard of Pribenic, and which they afterwards explored. The

country was delightful and full of interest to the student of antiquity, as well as to those desirous of visiting an almost entirely unknown portion of Bohemia. Pribenic is a ruined town with wall. It was built in the thirteenth century, and was destroyed by the Taborites in 1420. A very interesting old town known as Prachatic was in the locality. This place had a wall and a quaint gateway, over which are some curious specimens of coloured figure work.

On the second day, the members met again at the Fine Arts Academy, Bristol, where Mr. Latimer read a paper on "Civil Bristol," and Mr. John Taylor one on "Ecclesiastical Bristol." Both papers were exceedingly interesting. Later on, the members, divided for convenience into two parties, made a tour of the city, noting the chief points of interest. In the afternoon, the members met together in the Council House, where they were hospitably entertained by the Mayor (Sir Charles Wathen). They subsequently inspected the municipal insignia and plate, which were described by Mr. W. H. St. John Hope.

On the third day Wells and Glastonbury were visited. At Wells, Canon Church met the visitors, on their arrival, at the Church of St. Cuthbert, and gave a concise account of the edifice, setting forth the chief points of interest. He said it was difficult to understand or to know why a church so far south-west should have been dedicated to a northern saint. It was reasonable to suppose that there was formerly a Saxon church on that spot, and that the saint chosen was a favourite one of King Alfred. There was a record that the church was consecrated by Bishop Goldfrey in 1124. Evidence existed of the church having been originally cruciform, with a tower in the centre. At the south entrance there was some Barley English moulding and other signs of thirteenth-century style; but undoubtedly the present building was mainly fifteenth-century work. The visitors afterwards walked to the Cathedral, where Canon Church gave a description of the building. The outside of the north transept, the crypt under the Chapter-house (a storehouse of interesting relics), the Chapter-house itself, the choir, the Lady Chapel, the cloisters, the Vicar's-close, and the College-library, were also visited, Canon Church and Mr. Hope acting as guides. The party entered the grounds of the Bishop's Palace, and saw the ruins of the great hall, and also visited the Bishop's chapel of the Holy Trinity and other parts. In the afternoon the members drove to Glastonbury, where they visited the famous abbey. Professor Freeman met them at the ruins, and gave a historical sketch of the abbey. The professor mentioned, among other interesting places to see, the tower on the top of Tor, the old barn, the hospital, the Abbot's kitchen, and the "Tribunal of Inquisition." Professor Freeman and Mr. Hope conducted the party round the abbey, and pointed out some of the chief architectural features of the ruins. Several of the other objects named were also visited by members of the party. They returned subsequently to Wells, and thence to Bristol.

On the fourth and last day (Friday, the 25th ult.), the final meetings and visits took place. The members first of all assembled in the Grand Jury Room of the Bristol Guildhall, when certain formal business was transacted and votes of thanks were accorded to all and sundry who had contributed to the success of the meeting. It was decided to hold the next annual meeting at Moreton-in-the-Marsh. The members of the Society subsequently visited the fine Church of St. Mary Redcliffe, of which a description was given by the Rev. C. E. Cornish, the vicar. They also went to the Hermitage near, and to Canynge's house, Mr. John Taylor acting as guide. Finally, they proceeded to Temple Church, where the Rev. W. Hazeldine gave a description of the archaeological associations of the building.

#### NATIONAL ASSOCIATION OF MASTER BUILDERS OF GREAT BRITAIN.

The half-yearly meeting of the National Association of Master Builders of Great Britain was held on Wednesday, the 23rd ult., at the Hartley Institution, Southampton, under the Presidency of Mr. J. H. Colls, of London, when representatives were present from London, Liverpool, Manchester, Birmingham, Leeds, Nottingham, Bristol, Hull, The Potteries, and Newcastle, Cambridge, Southampton, Winchester, and Gosport.

The report and accounts for the past half-

year were passed and adopted, and several matters in the interest of the building trades were discussed, and also what measures should be taken to strengthen the Association.

A vote of thanks was passed to the chairman for his services to the Association during the past half-year; and also to the committee of the Hartley Institution, for their allowing the use of the room for the meeting.

#### THE CARPENTERS' COMPANY AND TECHNICAL EDUCATION.

The third examination inaugurated by the Worshipful Company of Carpenters has just been held. This examination is of a very stringent character, the candidates having to present themselves on two evenings at Carpenters' Hall for the written work, and on the following day they are examined in practical work at the Company's workshops at their institute at Stratford, and on the fourth day they are orally examined by the committee consisting of the Presidents of the Institute of British Architects, the Institution of Civil Engineers, the Architectural Association, the Institute of Builders, the Clerks of Works' Association, Sir P. Magnus, Sir J. C. Lawrence, Bart., Professor T. Roger Smith, and Professor Banister Fletcher. The examiners did not award a gold medal, but gave one silver and two bronze medals. The following are the successful candidates:—

*First-class Certificates*:—T. Vest (Silver Medal); T. J. Evans (Bronze Medal); J. Davison (Bronze Medal); J. Goddard, W. M. Dixon, and D. Bryant.

*Second-class Certificates*:—J. Inkpen, G. A. Mitchell, J. Davies, W. H. Masters, W. E. Cutter, and H. J. Prosser.

#### Illustrations.

#### THE NEW MONTPELLIER MEDICAL BATHS AND WINTER GARDEN, HARROGATE.

**T**HIS building, when finished, will be the most complete of its kind in this country, and, except in size, not inferior to any on the Continent. Provision will be made for the use of the natural mineral waters in all the ways familiar to modern medical science.

The building, as designed, has primarily two divisions, the one for water-drinkers and the other for bathers. The first consists of a Pump-room, with a counter for the distribution of the water in the ordinary way, and a Winter Garden having an area of over 8,000 ft. super., in which the water-drinkers can take the necessary exercise in all weathers and in which entertainments can be given. The Winter Garden faces south, and in fine weather can be thrown completely open.

The bath buildings proper contain a large central hall, with cooling, reading, and refreshment rooms, as well as a general ticket office and manager's room, and four complete suites of baths, each entered directly from the central hall. The four suites are, respectively, the gentlemen's baths, the ladies' baths, the Turkish bath, and the inhalation, pulverisation, and dry massage rooms. The whole of the accommodation for bathers and water drinkers is upon one level. An approach without any steps gives access at the west end of the building for Bath-chairs and for the most helpless invalids. The basement affords accommodation for the laundry, the engineer's department, and the mess-rooms, &c., for the attendants.

Messrs. Baggallay & Bristowe are the architects of the buildings, their design having obtained the first premium in the recent competition, and the work will be carried out under their supervision.

#### COMPETITION DESIGN FOR SHEFFIELD MUNICIPAL BUILDINGS.

We publish this week the elevations and principal plans of the design submitted by Mr. W. Harry and Mr. Bernard Smith, forming the last of the set of six designs of the final competition.

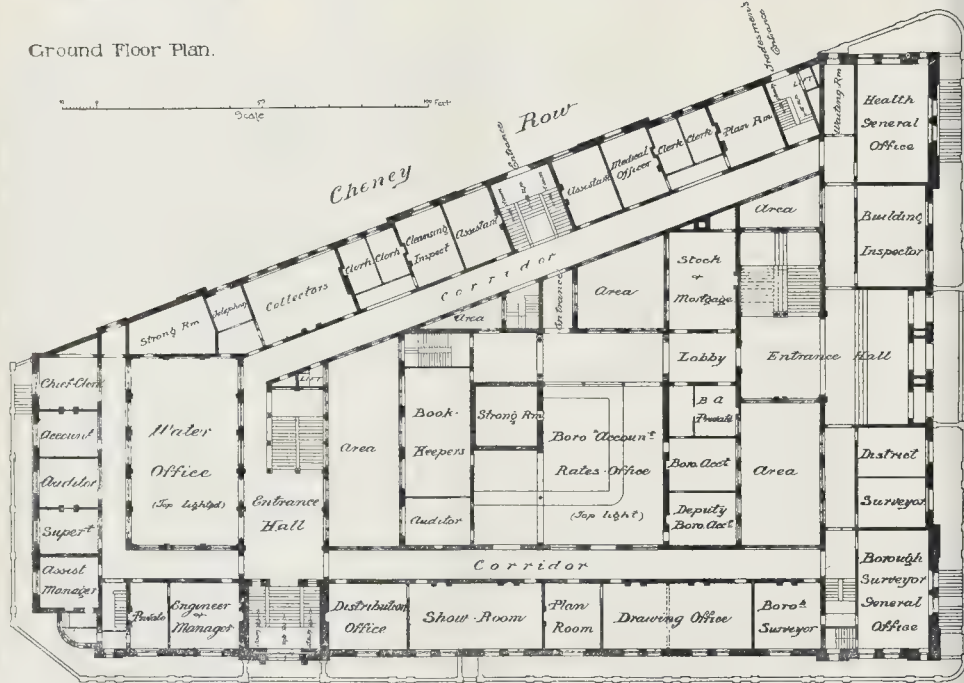
The following notes are extracted from the reports sent with the first and second set of competition drawings:—

"In the set of drawings sent herewith several

First Floor Plan



Ground Floor Plan.



Sheffield Municipal Buildings, Final Competition: Plans of Design submitted by Messrs. W. Harvey and Bernard Smith.

important modifications of the original plan have been made.

The large principal offices are arranged on the ground-floor level as before, but the entrance from Norfolk-street has been abandoned and a large entrance and staircase hall placed at the corner of Surrey and Norfolk streets.

The Borough Accountant's office has been so arranged that all the rooms of the staff now open direct into the general office. The Rates Office is

approached from Pinstone-street, Surrey-street, and Cheney-row, and as now planned the Pinstone-street entrance can be closed if required on special occasions without in any way interfering with the general work of the office.

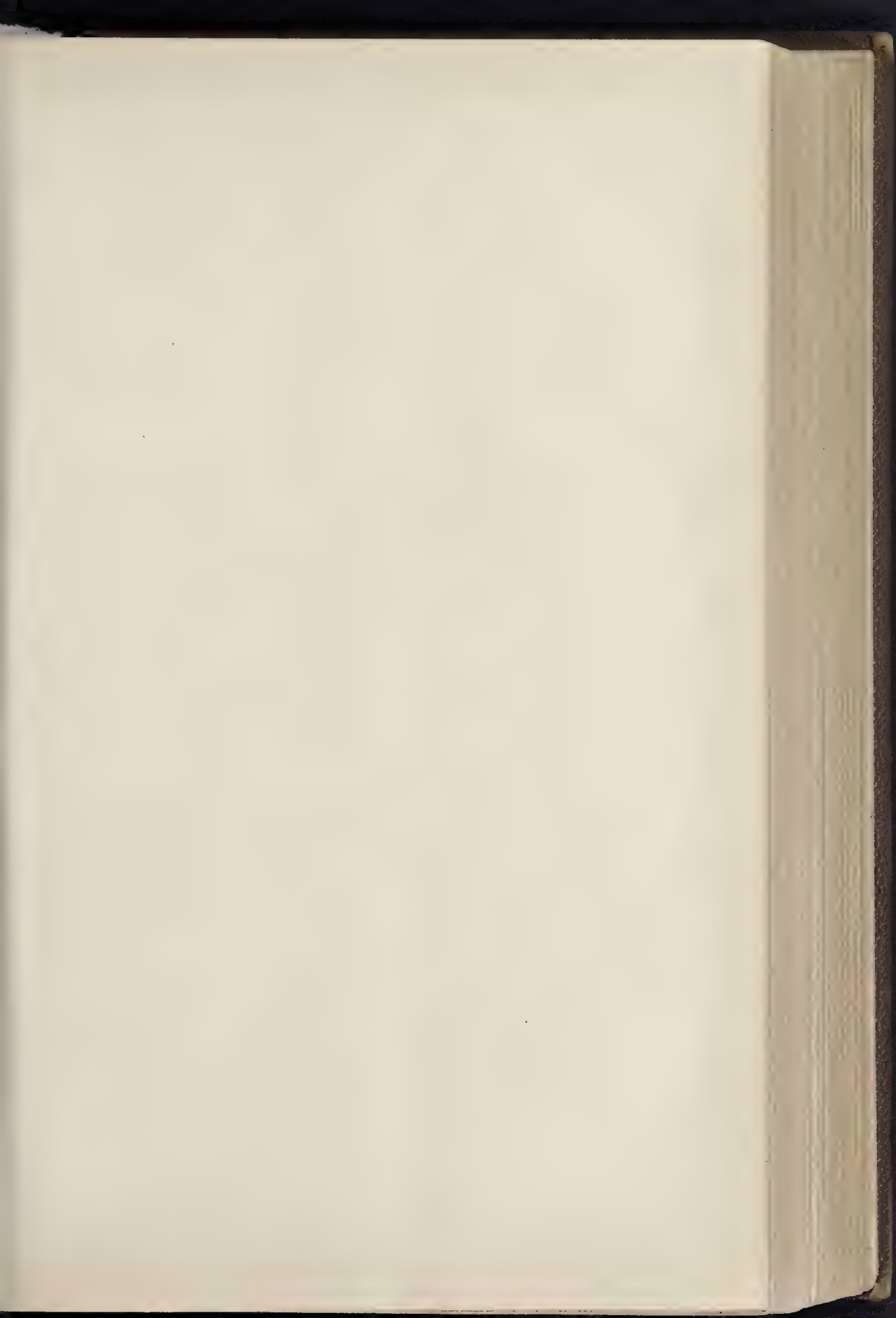
The arrangement of the Water Department has been considerably varied; by the accompanying plan the offices of the staff are all grouped around the general office, a private corridor communicates and avoids the necessity of the staff entering the

general office in order to reach each other's offices; staircase at the end of the corridor next Surrey-street leads direct to the Engineer's office and drawing office on the floor above.

An alteration has been made in the Borough Surveyor's department, by which the District Surveyor's office is brought close to the Surveyor's office.

In the Health Department the general office has been placed at the corner of Pinstone-street and







PINSTONE





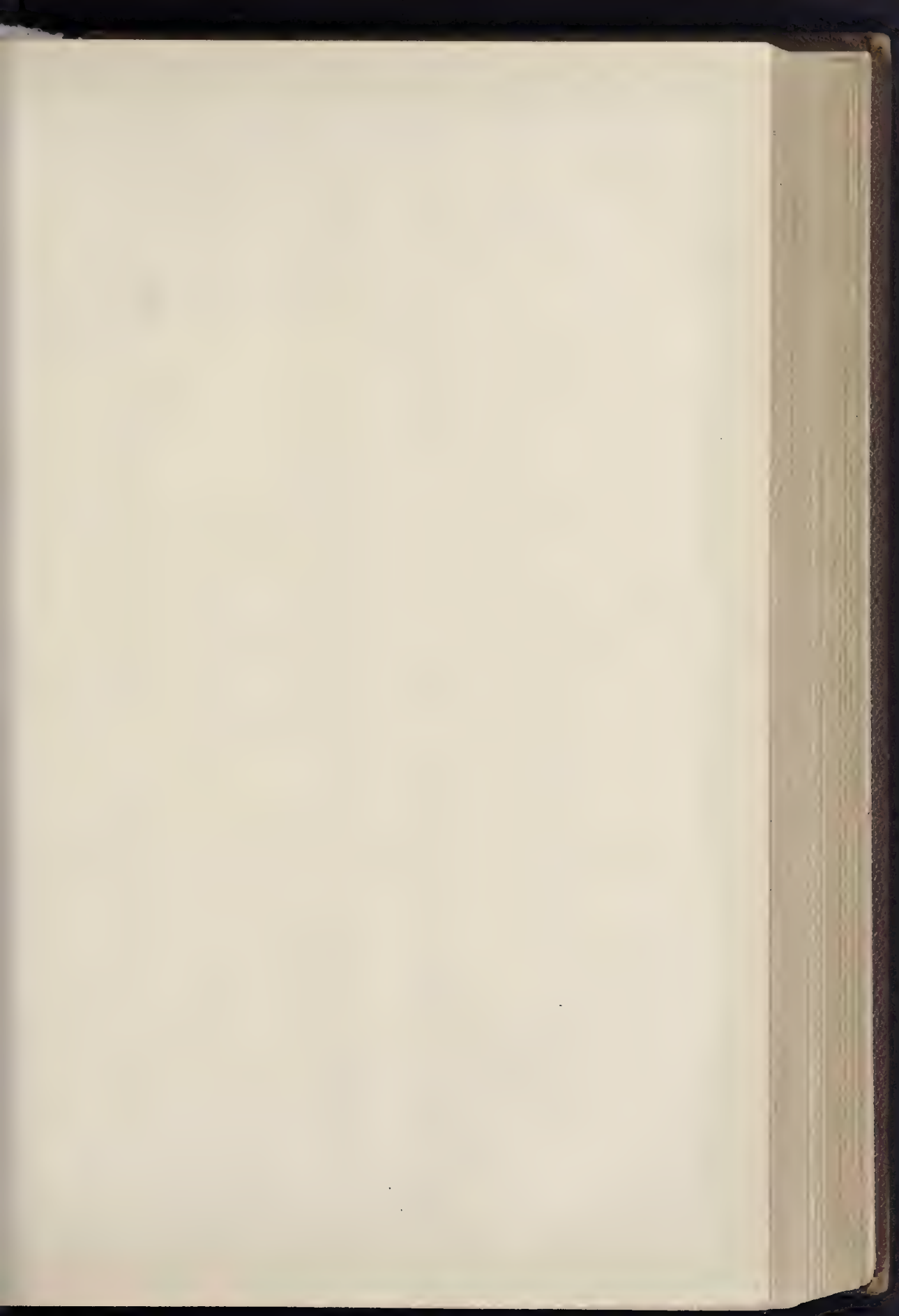
ELEVATION. —

PHOTO LITHO SPRAGUE & CO 27 MARK LANE CANCER 57 LONDON E C

SUBMITTED BY MR. W HARVEY, F.R.I.B.A., AND MR. BERNARD SMITH.







THE BUILDER, AUGUST 2, 1890

SHEFFIELD MUNICIPAL BUILDINGS FINAL COMPETITION.

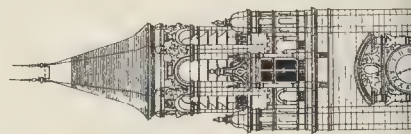
DESIGN SUBMITTED BY MR. W. HARVEY, F.R.I.B.A., AND MR. BERNARD SMITH.



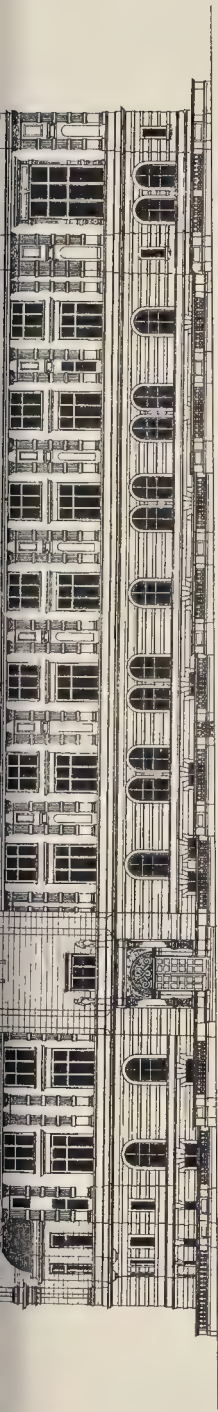
NORFOLK STREET ELEVATION.

SCALE OF FEET ———

1 2 3 4 5 6 7 8 9 10 11 12







— SURREY STREET ELEVATION. —

Scale of Feet 1 2 3 4 5 6 7 8 9 10



— CHENEY ROW ELEVATION. —

Scale of Feet 1 2 3 4 5 6 7 8 9 10





Cheney-row, the medical offices and Cleansing Inspectors' offices being placed on each side of the Cheney-row entrance.

On the first floor the principal alterations consist of the arrangement for a second Mayor's parlour for business use, the provision of a lobby leading directly from the Council Chamber ante-room to the committee-rooms, and a re-arrangement of the Town Clerk's department, which it is considered would prove more convenient.

The principal staircase adjoins the large entrance-hall, and forms the communication to the reception-rooms and Council Chamber only.

The reception-rooms and Mayor's parlour occupy the whole of the Finsbury-street front, the dining-room having a serving-room adjoining.

The Council Chamber is placed in the centre of the block over the subordinate offices of the Rates Office. The committee-rooms being grouped on the Cheney-row front, these have a separate staircase and access to the Council Chamber. A smaller staircase enclosed from the ground-floors level provides access for the general public to the gallery in Council Chamber.

The style of architecture adopted for the elevation is Early French Renaissance, the fronts proposed to be faced with stone from the Huddersfield quarries.

The net cubical contents of the building, inclusive of the tower, are 2,220,300 ft., and the cost, calculated at the rate of 10d. per foot cube, would be 92,510l. If the tower were omitted the cost could be reduced to 89,500l."

#### THE SURREY ARCHÆOLOGICAL SOCIETY.

ABOUT one hundred members and friends, including ladies, attended the annual excursion of this Society on Wednesday, the 23rd ult.

The rendezvous was at Leatherhead, whence vehicles drove the party to Little Bookham, where the church was visited. Mr. A. J. Style, A.R.I.B.A., here said that when or by whom the church was built was not known, but it was thought probable that it was designed by the architect who planned the neighbouring church of Fetcham. In Domesday Book the manor was described as being held by William de Broasse; Halsart was the name of the tenant. In 1275 it was held by Sir John Hausart. In 1281 William de Broasse (the fifth in descent from the William mentioned in Domesday) obtained a grant of free warren, and his widow Mary, who died in 1326, held the manor and church of the honour of Gloucester and of Bramber. It was, therefore, probable that the church was built by one of the De Broasse family, or the Hausards, who were tenants under them in the twelfth century, and it either had, or was intended to have, a south aisle. The sexton, when digging a grave about 7 ft. from the south wall, came upon flints and rubble which might have been the foundation of the south aisle wall. Further southward other foundations, probably of the south porch, were discovered. The small windows at the west end, and in the north wall, to the west of the doorway, as well as the north doorway, are of the original Norman work. The arches and capitals of the columns on the south side were extremely interesting, and excellent specimens of Norman architecture. Some of the windows were probably of the fourteenth or fifteenth century, and others much later. There is one bell in the wooden bellcot, and the date on the weather-vane is 1744, with the initials "J.S." There were some fragments of the original stained glass, particularly the head of Our Saviour in the small west window. A piece of metal, which was dug up, and appeared to be the lid of a censer, was produced by the vicar. The font was a plain bowl, and there was a local tradition that Cromwell's soldiers were responsible for the cracks in it; but Mr. Style said he did not know what authority there was for supposing that Cromwell or his soldiers ever visited Little Bookham. The manor passed through various generations to the Howard family, then to the Effingham branch of that family, to Lord Monson, and it was afterwards held by Sir John Garrett, Sir Benjamin Madox, and the Pollen family. There were no brasses in the church, said Mr. Style, and he concluded by pointing out the chief monuments and tablets.

The party was next driven to Great Bookham. Major Alfred Heales, F.S.A., here described the church, and said he read a paper here in 1867, and which would be found illustrated and printed in Volume V. of the Society's "Transactions," and he had little to add to what he then said. The church consisted of a western tower, nave, and aisles (the southern of which is enlarged as a chapel), and chancel. The earliest record of the church occurred in Domesday

Book. The tower and south side of the nave are the earliest parts, and were probably erected about the middle of the twelfth century, or rather sooner. In the fourteenth century the Slyfield family built the large aisle. The church belonged to Chertsey Abbey prior to the Conquest. It always was, and still is, the duty of a rector to repair or, if necessary, even to rebuild the chancel, a duty which Chertsey Abbey honourably performed by building the present spacious chancel in 1341, and the fact was commemorated by an inscription on a small slab let into the chancel wall, south of the east window, inside, which, to the good fortune of archaeologists, still remains there, though only cut in clunch. The slab also records that the church was dedicated to Saint Nicolas by the Abbot Jol de Rutherford. Various alterations had taken place in the building, but the ancient portions of the structure had been well preserved. Major Heales also drew attention to an elm-tree in the churchyard, which was planted in 1627. Mr. Ralph Nevill pointed out two admirable pieces of sculpture, one being a monument to the memory of Robert Shiers, of Slyfield, his wife, Elizabeth, and his son, George, erected in 1668; the other was to Thomas Moore, erected in 1735.

"Fairfield," formerly the residence of Madame D'Arblay (Fanny Burney), was the next place visited, and here Mr. Bousfield, the owner of the house, read a paper, in which he showed that the life of Fanny Burney, the authoress of "Evelina," who, in 1793, became the wife of General D'Arblay, was much connected with the county of Surrey. She was married to the General in Mickleham Church, and immediately afterwards took lodgings at Great Bookham, and in less than five months they removed to "Fairfield." Her residence here comprised the four happiest years of her married life—from 1793 to 1797. She and her husband then removed to a house at Westhumble, in Mickleham, on land adjoining Norbury-park, where they remained till 1802, when General D'Arblay went to France. Mr. Bousfield concluded by reading several extracts from Madame D'Arblay's diary. Another drive brought the party to

Slyfields Manor, which was described by Mr. Ralph Nevill, F.S.A. He said it was traditionally believed that Queen Elizabeth had slept there. It appeared from the Cobham register that Queen Elizabeth did visit the place when it belonged to a former family, but she could not have slept in that house, for it was of a later period. The estate belonged to the family of Slyfields down to 1610, when it was sold to the Shiers family, whose monument he had pointed out in Great Bookham Church. He then described the highly ornamental plaster ceilings. These ceilings he thought were probably mostly the work of foreigners, but one of the best was undoubtedly done by an Englishman. The remarkable brickwork, and the very peculiar and interesting fixtures, were also pointed out by Mr. Nevill, who also said that the late Mr. Charles Baily, architect, who was a great authority on these subjects, had written an interesting paper on Slyfields Manor, which was published in Vol. VII. of the Society's "Transactions." After inspecting the rooms of the house, the company was again driven off, and proceeded to

Stoke D'Abernon, where, in the church, Mr. Mill Stephenson, F.S.A. (hon. secretary), read a paper. He said the earliest record of a church at Stoke D'Abernon was to be found in Domesday Book, which stated that Richard de Tonbridge held both the manor and advowson. Some parts of that church still remained in the south wall of the nave, and previous to the restoration of the church, in 1866, some of the "long and short" work so characteristic of Saxon architecture could be seen. In the first half of the thirteenth century one of the D'Abernon family, whose fine brass was in the chancel, enlarged and practically rebuilt the church in the then prevailing style,—the Early English. The chancel was entirely rebuilt. In the reign of Henry VII., Sir John Norbury added the chantry on the north side, and by his will it was found that the church was dedicated to St. John the Baptist and St. James. In the early part of the seventeenth century Sir Thomas Vincent carried out extensive repairs, and probably refitted the church. The pulpit was also presented by one of the same family, and was a fine specimen of Jacobean work. This church underwent complete restoration in 1866. The font was probably of the Early English period, and in the small window

behind were collected all the fragments of the old stained-glass. There were three bells in the tower, one of which was inscribed 1687.

Mr. J. G. Waller, F.S.A., next described the brasses in the church. The two in the chancel to the D'Abernon family were, he said, the most interesting brasses in existence. One, to the first Sir John D'Abernon, was the oldest in England, and the oldest but two to be found anywhere, the two exceptions being in Germany. The date of this brass was 1277. Having described the costumes, Mr. Waller expressed his regret that the brasses had not been better taken care of since he first saw them fifty-three years ago, when they were in a better state of preservation than at present. There were three brasses of the D'Abernon family, and others of the Bray, Norbury, and other families.

The Manor House, adjoining, was next inspected by permission of the Rev. F. P. Phillips, M.A., where there was a fine collection of Morland's and other paintings. The carriages now took the party back to Leatherhead, where at the "Swan" hotel, Major Heales presided at a collation, and the several readers of the papers were thanked.

#### BUILDERS' BENEVOLENT INSTITUTION.

##### ANNUAL MEETING.

THE forty-third annual meeting of this Institution took place on Thursday, July 24, at 4, Vernon-place, Bloomsbury-square, W.C. Mr. George Pincknett, J.P. (hon. treasurer), occupied the chair in the unavoidable absence of Mr. J. W. Hobbs, J.P. (president), and amongst those present were Messrs. Thomas Stirling, Charles Bussell, Robert Perkins, G. Evans, A. Ritchie, and other friends of the charity.

Major Bruton (secretary) read the report, in which the Committee congratulated the subscribers on the circumstance that the income from all sources had been sufficient to meet the necessary expenditure of the year. This gave great satisfaction to the Committee, and they desired to express their hearty thanks to Mr. J. W. Hobbs, J.P., for his able advocacy of the claims of the Institution, whereby the charity was substantially benefited. Whilst acknowledging with gratitude the success which had thus been achieved, the Committee hopefully trusted that the subscribers would not relax in their annual support of the Institution, as only by the persevering and united help of its well-wishers could it be made to prosper and to be continuous in effecting the good it is doing. In the past year there had been four deaths of pensioners, one man and one woman had been elected, and one man had been elected by the Institute of Builders, in accordance with the terms agreed upon by the Institute and the Committee. The Committee with much regret had to report the death of Sir Samuel Morton Peto, bart., who was a trustee and a munificent contributor to the Institution. He was President so far back as the year 1852. Mr. Frederick John Dove had been appointed a trustee in the place of the deceased baronet. The annual ball realised a profit of 55l. 5s. The annual dinner will take place, with the consent of the Worshipful Company of Carpenters, at their Hall, on Thursday, November 6, when Mr. William Shepherd, who has consented to accept the position of President of the Institution for the ensuing year, will preside.

The Chairman moved the adoption of the report.

Mr. Thomas Stirling seconded the motion, which was unanimously agreed to.

Cordial votes of thanks were passed to the President, the Vice-Presidents, Trustees, Treasurer, Committee, and Auditors.

The Chairman next proposed that Mr. William Shepherd be the President for the ensuing year.

Mr. Charles Bussell seconded the motion, which was cordially adopted.

A hearty vote of thanks was then accorded to Mr. Pincknett for presiding, and the proceedings terminated.

#### SUB-CONTRACTING IN THE BUILDING TRADE.

This is the subject of the leading article in the new number of the R.I.B.A. Journal. The writer is Mr. Edwin T. Hall, who deals with the subject in some detail, and makes reference to the full report which appeared in the *Builder* for June 28 of the interview which took place on the subject between the workmen's representatives and the Council of the Institute.



## ELECTRO-DEPOSITED COPPER.

THE Elmore Patent Copper Depositing Company have been holding a special exhibition of their seamless copper tubes, wires, and other copper productions.

The electro-depositing process by which these goods are made is exceedingly interesting and useful, and the results are absolute purity, and uniformity of density of metal and of thickness and tensile strength, with a certainty of true circular section of cylinders of any required diameter and length. The copper is deposited on a slowly revolving iron mandrel dipping into the electro-bath. The films of copper as they thus consecutively deposit their crystals are pressed down by burnishers, which are kept in contact with the upper portion of the copper-coated mandrel. When the deposit of copper has attained the required thickness, the mandrel, with its coating, is subjected to a heat of 400 degrees, when the expansion and cooling of the two metals being unequal, the separation of the two surfaces of iron and copper takes place, and the copper outer cylinder is slid away from the inner iron mandrel. These operations can be repeated on the same mandrel, or on others of varying sizes, cylinders of 12 ft. in length and 20 in. in diameter being amongst the specimens on view, and there is no reason why cylinders of larger, indeed, any size, should not be made if required.

For wire the copper cylinder, formed as described, is cut into square-sectioned strips of any dimensions according to the thickness of the copper deposited. These strips are passed through two or three dies which are ample for obtaining a round section for the wire, and which thus results without the hardening which occurs through the repeated drawings which ordinary wire undergoes and which renders it brittle and necessitates the after process of annealing.

In the market, the Elmore process has chiefly to contend with brazed tubes made from rolled copper. There is no question as to the superiority of seamless tubes, if the price of the latter be not in excess of the commercial price of the brazed tubes; and on this point the makers undertake to sell their goods at the same price as buyers are accustomed to buy the brazed goods for. For copper steam-pipes for modern high-pressure engines, the value of seamless tubes is very great, as with the steam strain upon them the brazed goods are always liable to explosion, and in such cases it is nearly always that the burst takes place in the vicinity of the weld. The strength of a brazed cylinder or pipe is only on a par with its weakest part, and any over-heating in the brazing operation may increase its brittleness locally to a very dangerous degree. In the electro-deposited process there is a complete elimination of the detriment to be effected by heat, as no heat at all is employed except that harmless heating necessary for separating the copper cylinder from its mandrel, and which is far below an injurious temperature. In some tests conducted by Mr. W. Parker for the committee of Lloyd's Register, the electro-deposited Elmore metal stood a pressure of 3,450 lb. per square inch before it burst. A solid drawn copper tube by a leading firm stood a pressure of 2,200 lb. A third tube of brazed sheet-copper burst at 2,200 lb. near the line of brazing—always a weak place. The Elmore tube stretched and expanded uniformly until the copper was reduced from  $\frac{3}{16}$  to  $\frac{1}{16}$  of an inch.

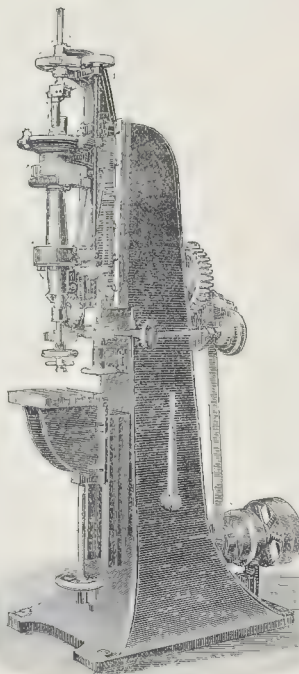
The solid drawn tube also expanded, but not in the same uniform way. The tenacity of these three descriptions of copper are given as 23 p, 20 p, and 14 tons per square inch. The superior ductility is also shown in the manner of breaking the contraction of area in the vicinity of the fracture,—being 12.8 per cent. in the sheet copper, 45 per cent. in the drawn copper, whilst in the deposited copper it averages 73 per cent. The reports on the breaking stress show, in many cases, 60,000 lb. per square inch of section. For electrical purposes the Elmore copper is very efficient, affording a conductivity as measured by the standard in use as high as 104 per cent. Professor Kennedy, of University College, also gives his testimony as to several tests of sections of copper of about 0.165 of a square inch, of which the breaking load amounted to 26.83 tons. The tensile strength can, it is said, be raised for special purposes to 40 tons per inch.

Finally, we may remark that the natural process by which the copper is deposited frees

the metal from all contaminations, and there is a certainty therefore of the absolute uniformity of the metal itself throughout the whole mass of copper deposited.

## SQUARE DRILLING.

It is obvious that square holes are a need in mechanical engineering. Such holes cannot be made by punching, on account of the stress put upon the metal being injurious in its effect upon it, and no other simple means has hitherto existed. The new machines, the Ainley-Oakes, and the Tyler & Ellis improvement thereof which have been shown in London recently, effect square, triangular, polygonal, and other linear forms of drilling by actual mechanical cutting. The first-named machine, by an ingenious arrangement of sleeves, cams, and an inner spindle carrying the cutting tool, combined with a mode of working against hard steel-plates of the nature of a template, perfectly fulfils its purpose, and produces square holes of fine fixed dimensions, from  $\frac{1}{4}$  in. to 1 in. in size, a fresh tool being required for each change. In the Tyler & Ellis improvement the spindle



The Tyler and Ellis Drilling Machine.

moves about a ball-joint at top, and is provided with a roller which travels round the inner edge of a template, being pressed outwards by springs. By lowering the inner spindle which carries the cutting-tool, the hole drilled can be varied with great accuracy, whilst to drill a parallel hole the whole head of the machine is lowered in guides in the main framing. The tool is so made that its cutting-edge terminates on the centre line of the spindle, and is suitable for any size or shape of hole. The template in each case requires to be changed, but this is easily done. This improved machine is also provided with a slotting motion, so that shapes of complex form can be turned out without difficulty. All the work is quickly and accurately performed, and the action of the machine can be applied not only to drilling, but to shaping the external forms of objects intended to fit the particular shape and size of hole drilled.

Of the utility of such a mechanical tool in engineering workshops it is unnecessary to speak; and if it only works well in practice without undue wear or liability to injury, there is a very wide field before it.

## THE LONDON COUNTY COUNCIL.

A SPECIAL meeting of the London County Council was held on Monday afternoon last at the County Hall, Spring-gardens, Sir John Lubbock, the Chairman, presiding.

**Superannuation Allowances to Officers and Employes.**—The consideration of the details of the superannuation scheme propounded by the Standing Committee was resumed. It was remembered that the Council last week agreed to the general principle of the scheme, and resolved to apply to Parliament for powers to carry it out. The main outlines of the scheme which is to be framed are as follow:—

"1. A deduction of 2½ per cent., or 6d. in the pound shall be made from the salaries of all employes not pensioned, and not at present entitled to pension.

2. The Council shall add 2½ per cent., or 6d. in the pound, making the total equal to 5 per cent.

3. All the members of the permanent staff in receipt of weekly wages shall be entitled voluntarily to contribute a proportion of their pay, at the rate of 6d. every £ and 3d. for every 10s., or portion thereof, the Council shall add thereto an equal amount.

4. There shall be no power to withdraw from obligation when an employe has joined the fund.

5. According to the recommendation of the Civil Establishments Commission and the Manchester Trades Committee, an account shall be kept in favour of an employe, and in the event either of his death, or of retirement under the Standing Order passed by the Council on March 11, last, through incapacity, or, unless he or his legal personal representatives shall receive the whole amount then standing to his credit including compound interest at the rate of 3 per cent. or an equivalent in the shape of an annuity as he or they may elect.

6. If there be no legal personal representative of an employe, the amount he has himself contributed, including compound interest at 3 per cent., may, at the discretion of the Council, be paid to the persons who appear to them entitled to receive the same.

7. In case of voluntary resignation or discharge for any other reason than fraud the employe shall receive the whole of his own contributions with compound interest thereon at 3 per cent.

8. In case an employe is discharged for fraud, or amount standing to his credit shall, to the extent of his own contributions, without interest, be applicable far as it will go, to replace the amount of his defalcations; and the balance (if any) of his own contributions shall be forfeited, or otherwise dealt with as the Council may see fit.

9. The expense of administering the fund shall be borne by the Council, and be under the control of the Finance Committee."

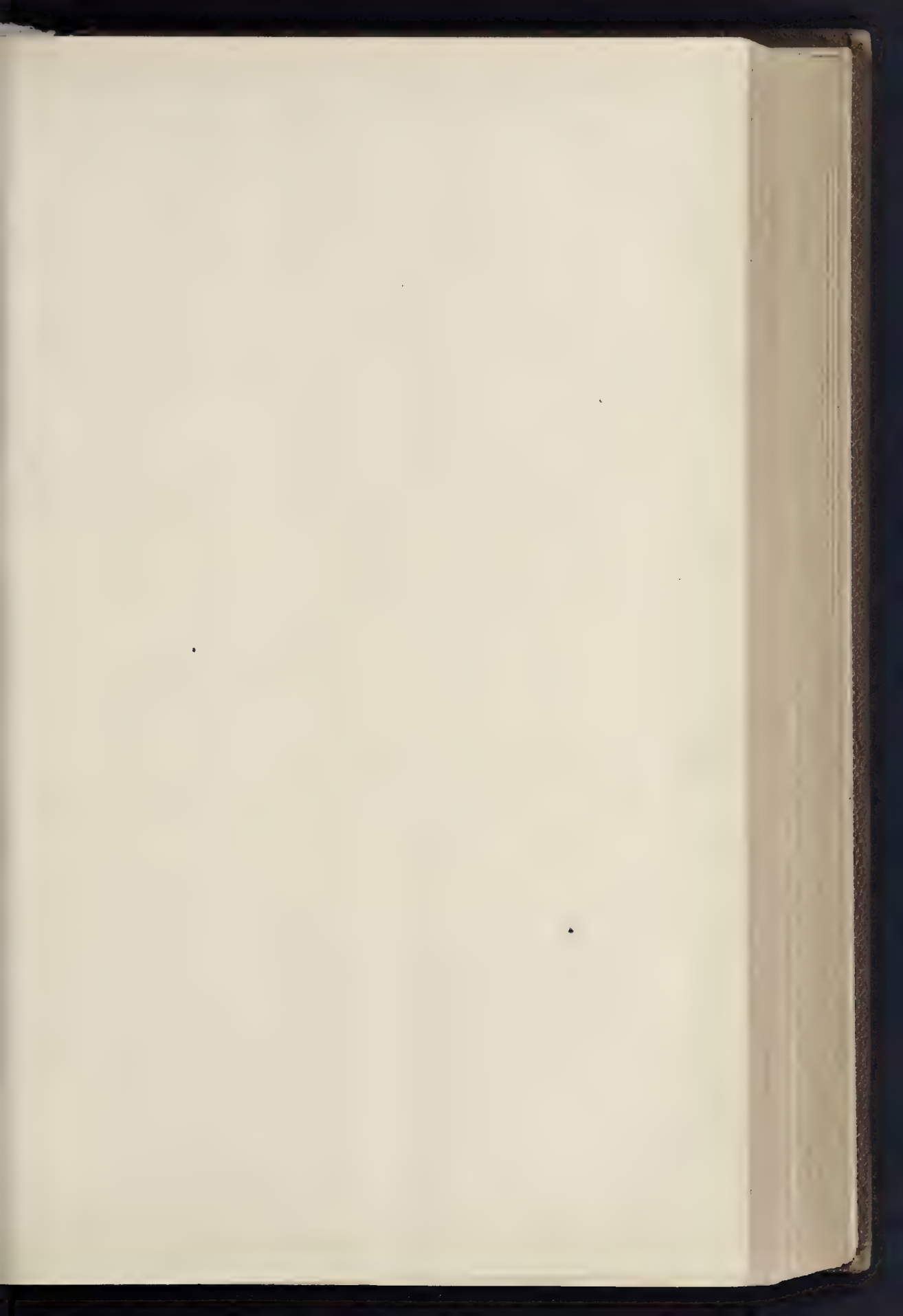
Councillor Lawson, in a long speech, explained the reasons which had induced the Standing Committee to frame the foregoing scheme, which, he said, was based on schemes which existed in connexion with the London and North-Western, the Great Western, the Midland, and other railway companies, and the Railway Clearing-House. A long discussion ensued, in the course of which it was alleged that the scheme would operate unfairly towards the higher officers of the Council, who, as a rule, entered the service at a much later period in life than the rank and file of the staff. To this objection it was replied that there was no compulsion for such officers to join the fund, and that if they did their large salaries would enable them to supplement a comparatively small benefit they would derive by joining the scheme. Ultimately the foregoing scheme was adopted, with some verbal amendments.

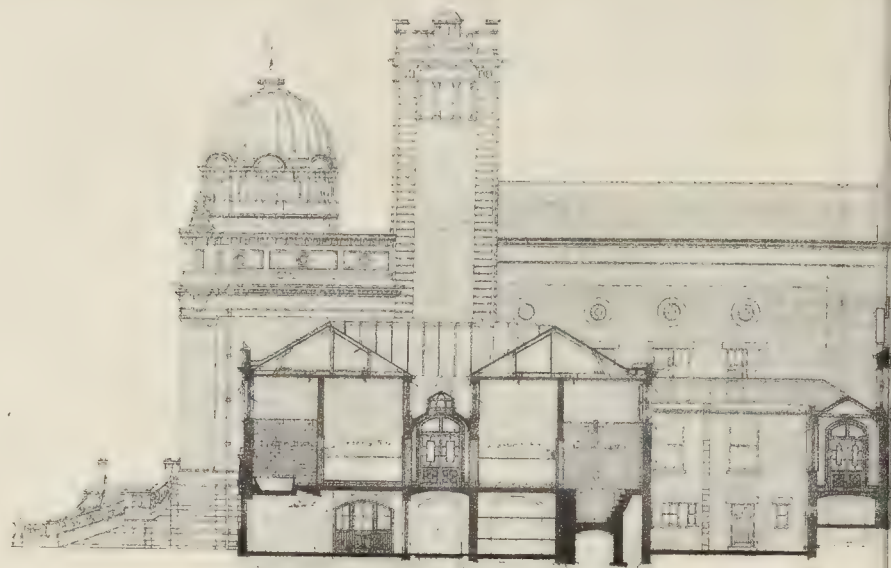
**Sick Pay and Compassionate Allowances.** The Council also agreed to certain recommendations of the Standing Committee as to sick-pay, and resolved to apply to Parliament for general powers to make special grants of compassionate nature to other of its employes than the members of the Metropolitan Fire Brigade, the Council already having power to make compassionate allowances to the members of the Fire Brigade incapacitated in the discharge of their duty.

**Projected Improvement Schemes.**—The Council then proceeded with the consideration of the improvement schemes recommended by the Improvements Committee, adjourned from last week. The first scheme to be considered at the meeting was No. 4, in accordance with which the Committee proposed the formation of a new street from Evelyn-street to Creek-road, Deptford, one of the improvements included in the Bill deposited by the Metropolitan Board of Works in 1888. The Committee said that the original plan had been revived, with the view of effecting an economy. They considered that the original plan accomplished all which the old one did, at a reduction in the cost, the estimated net cost being £2,000. They accordingly recommended—

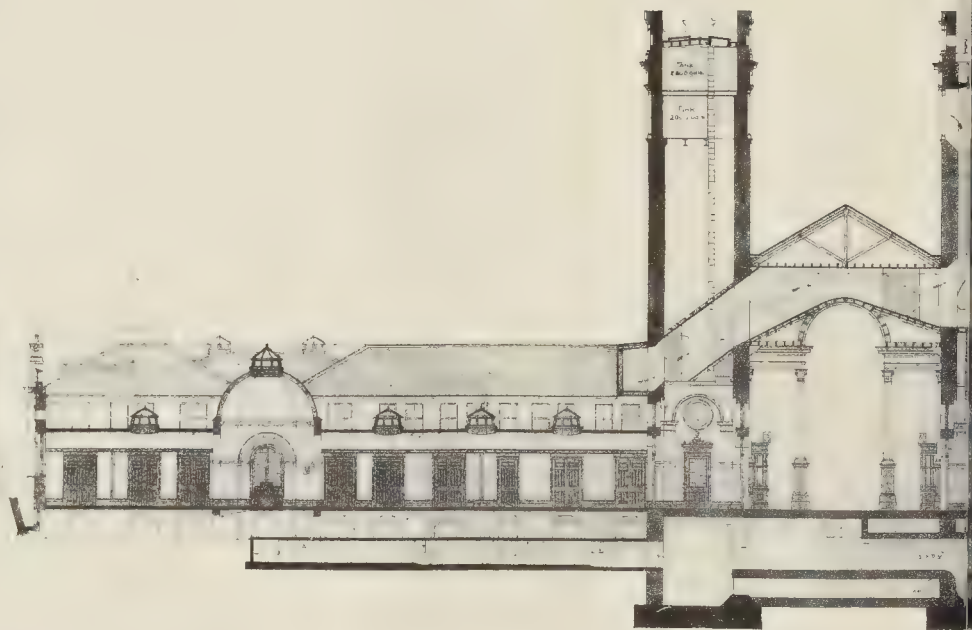
"That, subject to a contribution by the Greenwich District Board of one-fourth of the net cost, powers be sought in the next session of Parliament for the formation of a new street from Evelyn-street to Creek-road, Deptford, as shown upon the plan submitted herewith."







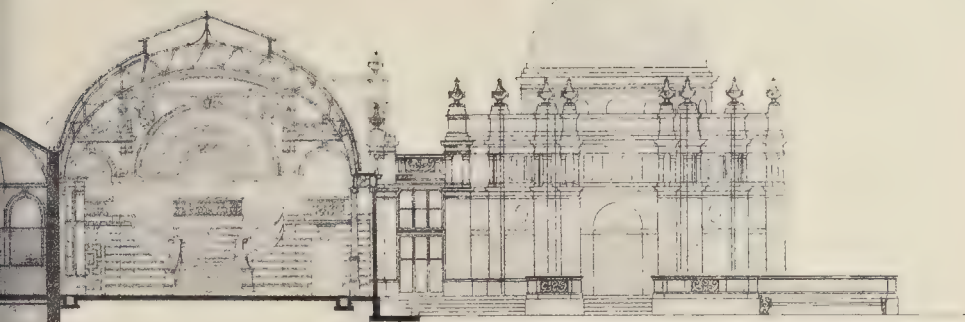
Cross Section



Sec. of Feet

Longitudinal Section of 2

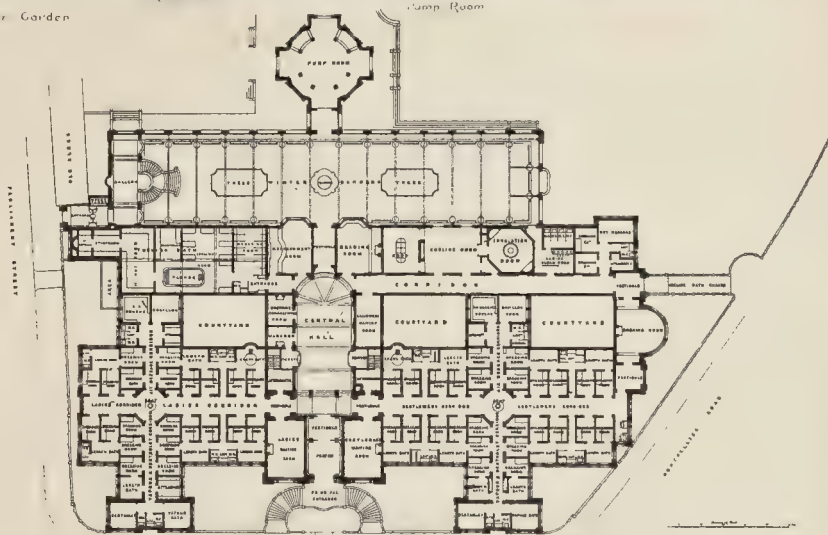




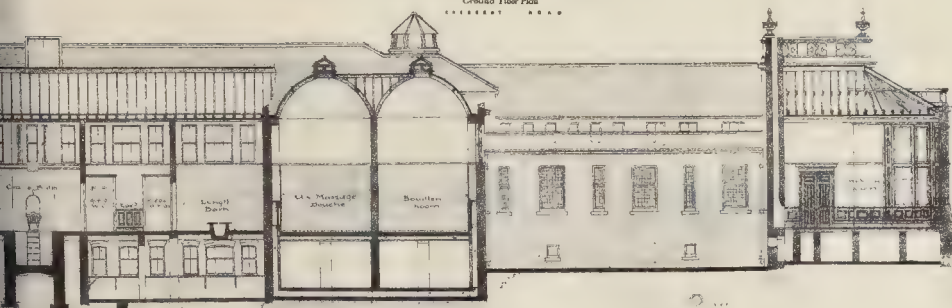
Winter Garden

Lump Room

2 line AB



Ground Floor Plan  
MARTIN LANE



ED





This recommendation was agreed to, after a long discussion, by 52 votes for to 19 against.

On the recommendation of the Committee that the Chelsea Embankment wall and Embankment be extended, the Vestry filling up the embankment, constructing two tidal baths, and two filtering beds, laying out certain small portions of the adjoining land as gardens, contributing one-half of the net cost estimated at £2,000, and retaining and keeping in repair the whole of the road, baths, gardens, &c., and that the Council maintain and light the Embankment wall and parapet as it did now in the case of other embankments.

Councillor Charles Harrison moved that the recommendations of the Committee be disagreed with. He said that the proposal involved almost all the elements of betterment, and it ought not to be undertaken until Parliament had had an opportunity of reconsidering their decision with regard to betterment.

Councillor Austin seconded the amendment, and after discussion, the Council divided, with the following result:—For the amendment, 36; against, 36.

The Chairman said that as he had to give a casting vote he thought he should be doing what the Council wished if he voted in favour of the report of the Committee.

The recommendations were subsequently agreed to.

The Council divided on the proposal to widen Fulham Palace-road and Queen-street, the Council contributing half the net cost, not to exceed £4,250, and the numbers were—For, 43; against, 27; majority in favour, 16.

On the proposal to widen High-street, Kensington, at an estimated net cost of £7,000, Councillor Lemon moved, and Alderman the Rev. Fleming Williams seconded, that the recommendation be disagreed with.

Councillor Lawson said he was not prepared to postpone every improvement in London, however necessary it might be, until what was called the principle of betterment was conceded.

After discussion, the amendment was adopted, and the recommendations of the Committee disagreed with, without a division being demanded.

On the proposal to widen St. George's-place, Knightsbridge, at an estimated total cost of £2,067, Councillor Lawson moved that the recommendation be disagreed with on the ground that there was no contribution towards the improvement on the part of the local authority.

The subject of this improvement was still under discussion when the Council adjourned.

The last ordinary weekly meeting of the Council prior to the holiday recess was held on Tuesday last, Sir John Lubbock presiding.

*Election of a Vice-Chairman.*—On the motion of Councillor James Beal, seconded by Councillor Benn, Alderman Sir Thomas H. Farrer was unanimously elected Vice-Chairman, in the room of Sir John Lubbock, who has succeeded Lord Rosebery in the Chairmanship.

*Further Consideration of Improvement Schemes.*—The Council then proceeded with the further consideration of the Improvements Committee's report. The Committee's recommendation to widen the Knightsbridge-road at St. George's-place, Knightsbridge, at an estimated cost of £2,067, was defeated by 53 to 18. Subsequently, an amendment moved by Councillor Howell Williams, pledging the Council to carry out the improvement on condition that the parish of St. George's, Hanover-square, contributed one-fourth of the estimated cost of the improvement, was agreed to.

The Council then proceeded with the ninth and last recommendation of the Improvements Committee, viz., that for the widening of a part of the Albert Embankment to improve the line of thoroughfare from Westminster Bridge to Battersea, at an estimated cost of £26,500.

Councillor Westcott, as an amendment to the recommendation, proposed that it be approved, subject to the parish of Lambeth contributing one-fourth of the cost. The amendment was carried, and the recommendation approved as amended.

*Election of two District Surveyors.*—The Building Act Committee recommended:—

"That Mr. Edward John Tarver be appointed District Surveyor for the District of South St. Marylebone, and Mr. Josiah Goodchild be appointed District Surveyor for the District of East Islington."

After transacting other business, the Council adjourned for the holidays until September 30.

## Books.

*A Popular Manual of the Law of Railway Rates.* By B. S. FOSTER MACGHEE and H. C. RICHARDS. London: Simpkin, Marshall, & Co.

THIS is a subject upon which, until recently, very little had been written. The attention which it has of late years attracted, however, has had the effect of bringing out a number of more or less useful works, some elaborate and exhaustive, and others more brief and concise. This little volume is of the latter description, and contains a synopsis of the law as it stands at present, together with extracts from the existing classification, and a list of rates (presumably from London) to all the principal stations in the United Kingdom.

Both the authors are barristers-at-law, and the legal information selected is calculated to be very useful to the trading community, particularly the portion dealing with procedure before the Railway Commissioners. The schedules of rates, however, are incomplete, and will, we imagine, prove disappointing. The classification and tabulated list of rates only comprise the third, fourth, and fifth classes, the authors remarking in the preface that these are the classes which chiefly affect the retail trade of the country. Seeing, however, that a large number of those for whom the work is intended are interested also in classes one and two, it is difficult to see why they should have been ignored, especially as the additional information would have occupied so little extra space. For example, the grocer may find the rates for lump sugar and tea (third class), but not those for moist sugar, which is in Class 1, nor for coffee (Class 2). We also fail to find any mention of several articles which should be included in the three classes dealt with. Boots and shoes, for instance, are certainly provided for, but only when packed in parcels, hampers, or casks. We believe that boots are more frequently packed in cases than in any other way, and although the railway clearing-house classification places them in Class 3 when so packed, this is omitted. We should certainly recommend the authors, if they should find that there is a demand for another edition of this work, to extend the classification and add the two additional columns to the list of rates. Everything would then be embraced, except raw material and other heavy traffic conveyed at exceptional rates, and the book would be of much more service.

*The Electrical Engineer's Pocket-book of Modern Rules, Formulae, Tables, and Data.* By H. R. KEMPE. London: Crosby Lockwood & Son. 1890.

ANY work by the author of "A Handbook of Electrical Testing" must be of interest to electrical engineers. From this pocket-book all historical matter, or explanations which should be found in a text-book on the subject, have been carefully excluded, and the pages are almost entirely filled with numerical tables, definitions, and short notes. Indeed, the author is perhaps too brief at times; for, instance, under units we read 981 dynes=1 gramme, though doubtless he considers those who will refer to his pocket-book can insert the missing phrase if they wish.

In many cases quantities are given in both French and English units. This is necessary where power is concerned, since mechanical engineers always use English measure, but the less English units are introduced into electrical work the better. For all except lovers of long sums in arithmetic. A curious custom persists among writers of giving the formula for the tangent galvanometer in absolute measure, and the reader is left to find out for himself whether "current strength," given by the formula, is in C. G. S. units or amperes. Surely the ampere should be uniformly employed throughout a book of this kind.

As might be expected, the pages devoted to telegraph work are far more complete than those given up to the electrical light, and it is to be hoped that in future editions the portions dealing with the latter branch will be considerably enlarged. The important work done in recent years in connexion with magnetism, and the consequent simplicity of the new as compared with the old methods, is entirely omitted. This certainly ought not to

be, and is a serious fault in this otherwise valuable little book.

The concluding pages consist of a dictionary of technical terms. Many of the definitions are open to criticism, e.g., self-induction: Currents produced by the electric induction of a current on itself. At the same time it will prove of great use to those who have forgotten for the moment what any particular expression means.

We have received the first number of the *Art-Workman*, a new monthly publication, consisting entirely of plates of decorative work and furniture. The subjects published in the first number consist chiefly of modern work, reproduced from line drawings; the subjects selected are not in the purest taste in point of design, if they are intended as models, though they are rich in effect. The only old work illustrated consists of two capitals from Freiburg.—*The Gentlewoman*, a new magazine for ladies, contains a considerable variety of matter and illustration, including a suggestion in artistic design for the ceiling of a music-room, which is certainly original but not very decorative in effect. As on one page we find very sensible remarks against the absurdity and bad effects of tight-lacing &c., why on another page do we find those hideous "fashion" plates with figures drawn more like wasps than women? *The Gentlewoman* might make a very desirable new departure by giving fashion designs drawn to the figure as it is or should be, and not to impossible lay figures unlike anything in human nature.—*The Gas and Water Companies' Directory* (Hazell, Watson, & Viney) gives in a tabular form the leading particulars as to all the gas and water companies of the Kingdom.—*Specification of Plasterer's Work* issued by Messrs. Joseph Robinson & Co. gives particulars of specification for the use of "Robinson's Cement" with tables of the sections of iron joists required to carry cement concrete floors of this cement. It is a very useful memorandum for architects and builders.—*Die Architektur der Hannoverischen Schule* (Carl Manz, Hanover) is a publication appearing in parts, illustrating modern North German Gothic work, and is a painful illustration of the wretched debased cast-iron style of Gothic prevailing among modern German architects.—*The Classical Picture Gallery*, a monthly collection originated in Germany but published in London by H. Grevel & Co., gives in each number about a dozen very good photographic reproductions of celebrated pictures by old masters. It is worth the attention of those who wish to make a collection of illustrations of the works of great painters at a small cost.

## Correspondence.

To the Editor of THE BUILDER.

THE COLOMBIER OF BOOS, NORMANDY.

SIR,—While staying at Rouen, I went to see this small, homely, but most interesting and little known pigeon-house, some seven miles distant on the road to Fleury-sur-Audelle. Photographs of it are not to be had, and, having no time to measure it, I had to content myself with a rough sketch and some notes of it. It is smaller than that at the Maison d'Ango, near Dieppe, and entirely different in its treatment; but, in its way, is quite as interesting, and it well deserves to be carefully measured and illustrated. It shows, primarily, how much may be done with local materials. It is circular on plan within, and octagonal without, but again becoming circular to receive its roof by means of a bold cornice, most delicately moulded, and covered with reddish-brown tiles, and the whole capped with a pennant of lead, surmounted by a weather pigeon (much the worse for wear). It appears to be a work of the reign of Louis XII. or François I. Its doorway, much mutilated, is even now very beautiful, both in proportion and in detail; but the great charm of the work lies in the exquisite arcing and tracery of red brick of the upper story, which is quatre-foiled and trefoiled in alternate heads, the quoins at the angles being of limestone and the panels of red, grey, black, yellow, and green bricks, glazed and unglazed, of most beautiful and varied patterns. The plinth and wall below it to the ground level are, as all other stone is, of a beautiful limestone, made softer in colour by the growths upon it. Above the plinth,



up to the stringcourse under the aforementioned arading, the walling is of brick, glazed and unglazed, in square, lozenge, and random patterns, most wonderfully worked out, so as to give great wealth and change of design in every face, and still relieved by similar stone quoins. The circular roof is sufficiently broken up by a simple but most effective little dormer for access to the interior, the birds only at present occupying the upper story. A bold stringcourse of limestone separates the flat brick treatment over the plinth from the elaborate traceried and panelled work above it. It is quite impossible to describe the harmony of greys and the mellow tones of the brickwork and the work generally, and what may possibly have been at first a trifle "loud," is now made, by the kindly hands of time and decay, wonderfully soft, delicate, and refined.

One can but hope that the times may again come round when pigeons may be similarly housed, and the humblest buildings delighted in for their own sakes. The designer and builder of this little building must indeed have revelled in their work, and those who have eyes to see and hearts to feel cannot possibly visit this place without feelings of gratitude towards the unknown producers of it, rendered the more agreeable by the courtesy of its present owners. Hard by are the remains of religious buildings of much interest, but the "Colombier" is really quite enough to make the drive from Rouen (pleasant in itself) a thing to be looked forward to by the architect and the lover of the beautiful.

E. SWINFEN HARRIS, F.R.I.B.A.

#### THE BERMONDSEY PUBLIC LIBRARY COMPETITION.

SIR,—Your review of last week [p. 63, ante] was the first intimation I had that the designs in this competition were on view, and that the awards had been made. I was one of the competitors, and had been daily expecting to receive an official notice of the selected designs, and an invitation to come and see those that had been submitted. No notice has been sent, and the exhibition ended, I understand, last Saturday. A case of such discourtesy, to say nothing of the omission of thanks which might be extended to competitors who spend their time and money in complying with the invitation of the promoters, I have seldom come across.

After reading your review, I addressed a letter to the Hon. Sec. to the Commissioners, reminding him that I had, before preparing a design, asked him whether condition 4 of the Instructions, which runs thus: "There is no right to open windows overlooking any of the adjoining properties," referred to the property who Vaseo on the east side, and that his reply was that it did so refer. I obtained also a similar verbal answer from the Surveyor to the Vestry, Mr. Elkington, who, I understand, acted as the assessor. I further stated that I had had no official notice of the award, and that I should like to see the designs submitted, and to know how, in the face of condition 4, the first and fourth prizes had been awarded, as the authors of these designs have, as stated in the *Builder*, violated condition No. 4, and should have been by the Instructions "excluded from the competition."

Mr. Harrison replies, "the designs have been on view here all the last week, but are now being returned, yours amongst the number; by reason of the large number of competitors, notices could only be sent to those to whom premiums were awarded. As to the reasons why condition 4 was not adhered to I must refer you to Mr. Elkington."

The italics in the foregoing are mine, for I wish to direct special attention to them, as it hardly seems credible in this age of cheap printing and halfpenny postage that such a paltry excuse should be made. Mr. Harrison refers me to Mr. Elkington to explain the awards that have been made, and through you, Mr. Editor, I appeal to Caesar in the person of Mr. Elkington.

I have always looked upon competitions as a lottery, but I see no reason why lotteries, if they are to exist, should not be fairly conducted. All cannot win, but all have a right to insist on adherence to the instructions issued; a gross violation of an agreement entered into with competitors, and more thoughtless and discourteous treatment than that meted out by the Commissioners of the Bermondsey Free Library to competitors, I have not come across, and I wish there were some means of bringing their sins home to them. I shall await with some curiosity Mr. Elkington's explanation, which I hope will be forthcoming.

CHAS. A. ADAMS.  
66, Victoria-street, S. W., July 30, 1890.

#### OLD CHURCH FRESCOES.

SIR,—In reply to your correspondent [p. 70, ante], permit me to give some information on the point. Two years ago it was wished by the Dean of Winchester to have restored and preserved the

old paintings, or, as some call them, frescoes, in the Chapel of the Holy Sepulchre in the Cathedral, and as Mr. John Green Waller, F.S.A., of Bolsover-street, W., has written an illustrated and annotated edition of these paintings, which was published in the "Transactions" of the British Archaeological Association at the meeting held at Winchester, 1845, he was communicated with, and the result was that he came down to the Cathedral prepared to carry out the wishes of the Dean.

Having the pleasure of personally knowing Mr. Waller, I much enjoyed rendering him my assistance, and can therefore now impart some of the *modus operandi*. The paintings were covered with a sort of smearing of linewash, which we had to get off most carefully, so as not to take off the colours beneath; for this purpose we began with soft brushes and rags, but did not make much progress until the Dean and Bishop Sumner came and looked on. They saw the difficulty we had, when Bishop Sumner said: "Why don't you try flannel?" "Capital," said the Dean, who at once grasped the idea; "how nice it is to have a practical head." So he at once procured some soft, thick flannel, which we folded, and set to work, and off came the linewash beautifully, without disturbing the painting in the least. When all was got off that could be done in safety, Mr. Waller sprayed the paintings all over with vinegar, which brought out the colours wonderfully, and destroyed the linewash remaining. When quite dry, we sprayed the paintings over with a mixture which he brought with him. This he did twice, and by so doing he brought out and fixed the colours, and up to this time it has apparently proved for years to come a good preservative. I will add that the process can only be carried out when the atmosphere is warm, or rather over 60 deg.

Winchester, July 28.

H. D. C.

#### THE VENTILATION OF CHURCHES.

SIR,—I think a discussion in your columns on the ventilation of churches would not be without some good effect in evolving a remedy.

I am writing this just after having left an evening service in a church that seats over a thousand persons, and is always well filled, and the thoughts that occurred to me impel the penning of this. When the service is half through and the people sitting in their seats to hear the sermon, the church, no matter how lofty its roof may be, becomes very oppressive, consequently, after quiet sitting, the people become restless, languid, fidgetty, giddy, and then start coughing. There are many causes producing this uneasiness of body, one, the inherent impossibility of anyone to sit perfectly still and silent for twenty minutes to half an hour, the usual time of delivery of a sermon. Physically, unless the body is well trained, it is impossible to sit so silent and quiet as is required to listen attentively; one reason for such being that many persons have not long eaten their evening meal or taken their tea, consequently, after the walking to the church, their food is only just beginning to digest; but at the time this digestive process is taking place their brain is mentally on the stretch listening attentively to the sermon, or may be wishing the volume to hasten so slowly was over; by this mental strain digestion is disturbed, and the stomach becomes irritated, whence the short, dry cough so prevalent in all parts of the church. The chief cause, however, of the restlessness of the people assembled is the presence of a large amount of carbonic acid gas exhaled from the lungs of each person present. This gas is not only poisonous, but also has an irritating effect on the throat and stomach. As the gas is a very heavy one, it sinks down to the ground; consequently, when the people are seated they are in a dense, poisonous atmosphere which is becoming more and more charged with this carbonic acid gas every minute, until at last they feel faint and giddy. What I would like to draw attention of your architectural readers to is this.—Can they not attempt a system of ventilation which would lift off from the ground this heavy poisonous gas and clear it away? Of course the comfort of those assembled must be considered, no sudden draughts of air round their feet would be tolerated, neither should a descent from the ceiling of fresh air be made on to their heads; but could not the air of the building be exhausted by draught producers,—i.e., such as the Blackman air-propeller,—which, working in the upper parts of the building for a few minutes, would exhaust the vitiated air from all parts, and so purify the air of its most poisonous impurity?

H. C. STANAGE.

#### SMALL PROPERTY ARCHITECTURE.

SIR,—I cannot help thinking that it would be very good experience for some architects if they had to reside for a time in the small houses and the dwellings over which they prepare the plans. It is possible then, that a little deviation from the ordinary line of procedure might suggest itself to

\* Without controverting the general truth of our correspondent's letter, we may point out that as a general rule architects are not concerned in preparing the plans of the class of houses he refers to. They are mostly the work of speculating builders.—Ed.

their mind. I refer to the fact that the very room in such dwellings that is required to be the largest and most commodious in the house, is usually made the smallest and most uncomfortable. It is all very well for clerks and mechanics to have a little parlour to ask any one on occasionally, and also that it should be in the front rather than at the back of the building; but why not let it be a little one, and not suffer that particular room, for which there is least use of any, to occupy a larger area and to be more pleasant than any other in the place? Whereas the one in which the family live, and where most of the work has to be done, is usually a small, dark, uncomfortable place at the back, oftentimes only a sort of passage rather than a room. Really, the worst is that there is not a much greater influx to our lunatic asylums of poor wives and mothers, who have to spend the greater portion of their lives in such little cells; put up, too, as they are, with the children, who have scarcely space to move about in, and whose noise—through being so confined—is most distracting to the mother's ear. It seems to me that, with a very little contrivance, the evil might be remedied; and if the people who inhabit such dwellings and small houses could only have for their "living-room" (as it is called) a fair-sized, commodious room, with cooking convenience in the same, I believe it would be much appreciated by those who have families—and it is not many, comparatively, who have not.

A COMMERCIAL CLERK.

#### The Student's Column.

HOT-WATER SUPPLY FOR BATHS, LAVATORIES, ETC.—V.

BOILERS: continued.

WHEN ordering copper boilers it is most necessary to have brass strengthening bosses or rings brazed in where the pipes are connected, unless the plate is of good thickness, otherwise difficulty may be experienced in making a thoroughly rigid joint when inserting the unions, and the rim of the manhole should be similarly strengthened or still greater trouble will be occasioned in securing the manhole lid, and be sure the manhole is of good size, as makers are so apt to send out these boilers with not larger than a 3-in. manhole, tapped and screwed to take a 3-in. screw plug which does duty for a lid. It is needless to say such an arrangement is absurd, as but few workmen would be able to get more than their fingers through the hole, and a manhole might as well be omitted if the hand and arm cannot be got well through it.

A fairly important feature in a boiler is the manlid itself, which is provided to securely close the manhole. These lids have considerable variety, both in shape and size, but in general character or construction the majority of them are similar to fig. 9 (shown in section). This



FIG. 9.

consists of a circular or oval lid seen at the top of the illustration and a "bridge" which is shown below it; the pin through the centre with nut at the top securing the two; this is the usual style, but occasionally an inside lid is met with which merely consists of a nearly plain casting secured by two sets of screws passed through the boiler plate; this is a very simple lid, and, if anything, preferable to the outside lid, which occupies space unnecessarily, and it will be readily seen that the pressure of water within the boiler tends to make the lid more secure rather than to cause it to leak.

A form of manlid to be objected to, unless a very large hole has to be covered, is that which consists of a plain wrought plate secured by a number of "set" screws. In the first place, the wrought plate is easily made uneven by the least improper or careless usage; and, secondly, great care is needed in making the packing material equal in substance all round the hole, and the set screws have to be most carefully screwed up to effect a sound joint, and a still further objection of some importance, is that the strain exerted in tightening up these screws causes the threads to strip after two or three times.



Whatever form of manlid is used, its object is, of course, to stop up the manhole of the boiler in a thoroughly sound manner, as these boilers are often required to bear very high pressures (the inner surface of a manlid often has a pressure of 500 lbs. on it, i.e., 25 lbs. to the square inch); and as boilers and manlids are not made with such perfectly true surfaces that they will fit together in a water-tight manner, a jointing material has to be used between the surfaces. This jointing usually consists of hemp, with a mixture of red and white lead of the consistence of putty; this material has been used almost from the time boilers were first thought of, yet for general purposes nothing has superseded it to any noteworthy extent. The hemp is sometimes used in strands and sometimes chopped up and incorporated with the red and white lead mixture, but better than the hemp in hanks is a material called "gaskin," which is a soft, thick, cord-like substance. The particular advantage gained by using a cord is that dependence can be placed in making an even joint; with loose hemp a perfectly even joint is almost impossible.

A material now largely used by the majority of workmen and which answers very well, for the joints rarely fail, is ordinary cardboard of a moderate thickness. This the workmen obtain by breaking up a cardboard box or any other cardboard article, and the only preparation needed is to first cut a collar of it to fit the manlid, then soak it well in plain water; if only thin cardboard is obtainable two thicknesses is used; a mixture of red and white lead has to be applied with this. There is now a species of sheet asbestos made expressly for this purpose and it answers exceedingly well, but a little objection is that as it has to be used in the form of collars. These must either be made to order or cut with considerable waste, but the material itself answers admirably.

There is one other material deserving of mention, which is india-rubber, as it has several advantages peculiar to itself. This material is used in the form of collars or washers, several sizes of which can be found in stock at india-rubber warehouses and frequently at ironmongers; there is not such a difficulty in getting a size to fit with these as with asbestos, for the reason that any size can be stretched a little, if it is small or irregular, to the shape required, and, if necessity demands it, a circular collar can be made to fit around an oval lid; these collars should not fit loosely if it can be avoided. This material makes manlid packing a simple task. They do not need any preparation, no packing material, and they do not taint or render the water impure as the red and white lead joint often does, especially when a little too much of this material is used and squeezed into the boiler when the lid is tightened up; and if care is used a rubber collar can frequently be used a second time, and to effect this the surface of the collar that comes in contact with the boiler-plate should be black-leaded to prevent its adhering (there is no great objection to its adhering to the lid). This material also has its disadvantage, arising however mainly from careless or ignorant work on the part of the hot-water fitter. If the fitter screws his flow-pipe through the top of the boiler so that it projects to the least extent inside the boiler (as will be more fully explained later), or if he takes this pipe into the side of the boiler, it will to some extent cause a steam chamber to be formed close to the top surface of the boiler; and as steam will not protect the rubber from the action of the fire heat, it will fuse or melt, and in perhaps not more than two or three hours after lighting the fire; and rubber collars are also very troublesome where there is a liability of water running short, as immediately they are subjected to a little higher temperature than boiling water they fuse. Notwithstanding this they are to be highly recommended, as their disadvantages are only apparent when bad work or dangerous circumstances exist. An inside manlid with a rubber collar is as near being perfect as we have arrived at yet.

**INDEPENDENT BOILERS.**—It is only quite recently that the importance of using independent boilers for hot-water supply has come to the front, the chief reason being that residences even of large size were considered complete in their hot-water arrangements if a supply was provided to a bath, lavatory, pantry, scullery and housemaid's closet, and a good-sized kitchen range will furnish these with an abundant supply (or should do); but the desirability of having hot-water services conveniently situated for every practicable purpose is now

having a deal of attention by both professional men, tradesmen, and clients, and unfortunately a good many failures are being experienced, as it naturally does not readily occur to one's mind that the kitchen-range boiler is going to fail in the useful work it has done for so many years.

An instance occurred quite recently in which a six-foot range with a boot boiler of the largest possible size that could be fitted to such a range, failed most signally, for investigation showed that the cylinder (hot-water reservoir) was a very full size—viz., 100 gallons, the pipes were a very full size, being 1½ in. throughout; there were thirteen draw-off services, including three baths, and two taps in the stables, which have a great demand for hot water; also a butler's sink, which when three-fourths full held about sixteen gallons; and in addition the hall was heated by two radiators, and a linen-closet heated by a coil—all from the kitchen-range boiler. The result made one believe that the boiler would not try to do the work, as the constant demand gave the boiler no opportunity to heat up a store of water. The introduction of an independent boiler of medium size entirely remedied this, as these heaters are so very powerful and so very rapid in results.

It is intended to treat the question of radiators and coils somewhat fully when the time arrives, but it may be mentioned here that these articles greatly oppose the efficient working of a hot-water supply apparatus, as of course they are made expressly to rob the hot water of its heat by dissipating or diffusing it, whereas with a supply apparatus it is most desirable to conserve every particle of heat within the pipes.

Independent boilers have very many advantages, and wherever an opportunity to use them occurs they can be most strongly recommended.

In the first place they have the important advantage of requiring very little attention in use, the fire can be kept in for several hours with once feeding, so that water of a high temperature can be had at any hour in the night or early morning; this advantage alone is of the utmost value, preventing, for instance, the annoyance arising from the bath water not being hot in the morning owing to the servants rising at irregular hours, and should there be any heating coils in connection with the boiler these continue to give off heat when most needed, during the cold hours of early morning—a special advantage if it is a small conservatory in which the coil is fixed.

Small conservatories are often heated from the kitchen-range boiler, but cannot be at all successful owing to the kitchen fire being out when the heat is most needed, viz., in the night and early morning.

Another advantage, often overlooked, gained by the use of an independent boiler, is the fact that a kitchen range working without a boiler and one working with a boiler give very different results indeed; a range without a boiler at the back of the fire works with nearly double the efficiency, rapidity, and general good results of one with a boiler, and the difference in consumption of fuel is most obvious; a 5 ft. range with a high-pressure boiler costs as much in fuel as a 5 ft. range without a boiler, but with a moderate-sized independent boiler; further than this, the boiler fire can be urged independently of the range, and the cooking operations need not be regulated with any consideration for the water supply.

### SURVEYORSHIPS.

**BURNHAM (SOMERSET).**—The Local Board of Burnham, Somerset, have appointed Mr. Robert A. Wilson as their Surveyor, Waterworks Manager, and Inspector of Nuisances, in succession to Mr. John H. Palmer, resigned. Mr. Wilson has been assistant to Mr. Palmer for some years, practically carrying out all the duties of above appointment. There were twenty-five applicants for the appointment, and the person appointed is allowed to practise as an architect and civil engineer within a radius of ten miles from Burnham.

**TORQUAY.**—Among the applicants for the Surveyorship at Torquay are Mr. Heath, the present Assistant-Surveyor, and Mr. C. Macmahon, the Inspector of Nuisances; Mr. Wyatt, Surveyor to the Paignton Local Board; Mr. Garrett, Assistant-Surveyor at Bournemouth; Mr. E. Webb, of Barnstable; Mr. R. S. Scott, Ventnor; and Mr. H. J. Marten, C.E., Deputy Borough Surveyor at Bradford.

**DEATH OF PROF. HEINRICH HANSEN.**—The death is announced of Prof. Heinrich Hansen, Director of the Copenhagen Academy of Arts.

### GENERAL BUILDING NEWS.

**ST. SAVIOUR'S CHURCH, SOUTHWARK.**—On the 24th ult. the memorial-stone of the new nave of the collegiate church of St. Saviour, Southwark, was laid by the Prince of Wales. The new nave, of which Sir Arthur Blomfield, B.A., is the architect, was illustrated in this journal for May 10 last.

**HIGH SCHOOL FOR GIRLS, HIGHER TRANNMERE, BIRKENHEAD.**—A large hall has been added to the High School for Girls, Higher Trannmere, which will accommodate 200 persons, also a large room below of same size for cloak and play-room, with extended lavatories, the whole costing about 800l. Mr. James N. Crofts, of Liverpool, was the architect, and Mr. John Shaw, of Birkenhead, the builder. The lead lights were executed by Messrs. Rowlands & Co., of Liverpool, the concrete and wood-block flooring by Mr. Lwe, of Farnworth, and the heating on the small-bore system by Mr. R. Benton Gibbs, of Liverpool. The building was re-opened on Tuesday, the 22nd ult.

**PRIMITIVE METHODIST CHAPEL, CONGLETON.**—A new Primitive Methodist Church, with school underneath, is in course of erection at Congleton, from the designs of Mr. A. Conkington, architect, Tunstall. The building, with its fittings, will cost about 2,000l. Mr. John Worrall, of Congleton, is the contractor.

**SCHOOLS, WHALLEY RANGE, MANCHESTER.**—The alterations and enlargement of St. Margaret's National Schools have been commenced (in accordance with plans, &c., approved by the Education Department) by Messrs. R. Neill & Sons, builders, of Manchester, cost about 1,100l., under the superintendence of the architect, Mr. John Lowe, of Manchester.

**CONGREGATIONAL CHURCH, WITTINGTON, MANCHESTER.**—The contract for the erection of the lecture-hall and schools connected with this church has been accepted, and the work begun by Messrs. Southern & Sons, contractors, of Salford. The work, which involves an outlay of about 2,000l., will be carried out under the superintendence of Mr. John Lowe, architect, of Manchester.

**KINGTON MISSION CHURCH, HEREFORDSHIRE.**—The foundation stone of this mission church (which is to be erected as a memorial of the Rev. Matthew Wood and the Rev. Edward H. Harrison) was laid by Lady Ormshaw on August 1. The architects employed are Messrs. Kempton & Fowler.

**ST. PETER'S CHURCH, CENTRE, GLAMORGANSHIRE.** was consecrated by the Lord Bishop of Llandaff on Monday last. Between three and four years ago the late Mr. Griffith Llewellyn, of Eglwyn Hall, commissioned Mr. F. R. Kempton, of Birchfield, Herefordshire, to design a large church for the accommodation of the large population which had sprung up on his estates in the parish of Ystradgynaf. The original undertaking was for the bare church, but by the munificence of Mrs. Llewellyn all the important fittings and decorations to complete the church have been added. The design consists of a lofty nave, having an arcade of five bays surmounted by a clerestory. There are side aisles to the nave, and a western tower, a large south porch, a chancel somewhat higher than the nave, chancel aisles, roofed transept-wise, and having upper floors in each for organ and auxiliary choir. There is a morning chapel on the south side of the chancel. There are clergy and choir vestries, and a connecting passage behind the east wall of the chancel gives direct communication between the clergy vestry and morning chapel. The architecture is of thirteenth-century character throughout. Free use has been made of constructional colour in a variety of different kinds of stone, brickwork, alabaster, marbles, mosaic, tiles, and painted glass. The contract works, which have taken about two and a half years to complete, have been carried out by Mr. Thomas Collins, of Tewkesbury.

**BOARD SCHOOLS, WATFORD.**—The plans submitted by Messrs. Ayres & Ardron, architects, of London and Watford, in a recent competition for new Board Schools at Watford, Herts, have been accepted, with instructions to procure tenders for the work after the consent of the Education Department has been obtained.

**THE NEW ST. PANCRAS WORKHOUSE.**—On the 25th ult. the foundation stone of the new St. Pancras Workhouse was laid, on the site of a part of the old building which has been demolished. Mr. Churchwarden A. Boden, chairman of the workhouse building committee, stated that the question of rebuilding had been before the Board of Guardians many years, and many schemes had been considered. It had been decided to build a plain substantial building, so that there could be better arranged classification. Special attention would be given to the sanitary arrangements. There would be more accommodation for married couples, and also for another class, viz., the chronic loafing pauper, who would, although well housed, have to undergo the labour test. The Chairman of the Board of Guardians (Major-General Warren), having declared the stone to be well and truly laid, stated that the old building was erected in 1807, when the population was only 45,000; the population had increased to nearly 240,000, and during the eighty years five additions had been made to the building. Messrs. Kirk & Randall are the builders, the first contract amounting to 74,827l. The architects are Messrs. A. & C. Harston.



**ROYAL SOUTH LONDON OPHTHALMIC HOSPITAL.**—On the 24th ult. the foundation-stone of this new building, situate at St. George's Circus, by the obelisk at the bottom of Blackfriars-road, was laid by the Prince of Wales. Mr. Keith D. Young is the architect of the building, which will cost 20,000l. Mr. William Downs, of Walworth, is the contractor.

**MISSION CHURCH, MOSS SIDE, MANCHESTER.**—A contract for a mission church, in connexion with St. James's Church, has been accepted by the committee, and the work commenced. The outlay will be about 500l. Mr. Geo. Macfarlane is the contractor for the works, and the drawings have been prepared by Mr. John Lowe, architect, of Manchester, under whose superintendence the parish church was recently erected.

**PRIMITIVE METHODIST CHAPEL, COCKSHOTT, SALOP.**—Memorial stones were laid on the 21st ult. at Cockshott, Salop, of a Primitive Methodist Church and School, to cost about 700l. The plans have been prepared by Mr. A. Tomkinson, architect, Tunstall, and the contractors are Messrs. J. Wood & Son, of Willastow.

#### SANITARY AND ENGINEERING NEWS.

**EARLS BARTON WATER SUPPLY.**—A scheme has been designed by Mr. W. H. Radford, C.E., of Nottingham, for the supply of water to the village of Earls Barton. As the population is only 2,500, the inhabitants do not wish to carry out works involving a large capital outlay or annual maintenance. Four wells have been sunk through porous strata situate on rising ground above the village; and good water was found on the surface of a thick clay stratum at a depth of 20 ft. Neither of these wells would yield sufficient in itself to supply the village; but an ample supply can be obtained by connecting the four wells together with a collecting pipe laid just below the surface of the clay. The length of the 9-in. earthenware socketed collecting-pipe will be 300 yards; and it will have open joints at the top of the pipe to admit water. A 4-in. iron service-main will be conveyed to the end of the collecting pipe, and will connect the water to the distributing pipes in the village. The collecting pipe is sufficiently high in level to enable the greater part of the village to be supplied by gravitation. The part of the village which is too high to be supplied by gravitation, has already a good supply from surface wells; but the scheme is arranged so that a small pump can be put down at any time to raise the water into a tank, which would increase the pressure sufficiently to supply this part also. The cost of the gravitation scheme to supply these parts of the village now in need of water would only be 1,100l., and the annual expense would be practically nothing. If a pump and water-tank is added to supply the high part of the village the extra cost would be 400l. The scheme is now being considered by the local authorities.

**MERSEY DOCK EXTENSION.**—At a recent meeting, the Mersey Dock Board passed a scheme for the expenditure of over half a million sterling in the improvement and deepening of the docks. It was explained that vessels drawing 26 ft. of water could only go into dock on 116 days in the year. By the proposed alterations vessels of this draught could dock in Liverpool at any time.

#### STAINED GLASS AND DECORATION.

**SANFORD CHURCH, DEVON.**—A stained-glass window has just been placed in this church as a memorial to the late Lady Ferguson Daire. The window is a three-light one, and contains subjects of Mary sitting at the feet of our Lord, St. Anne teaching the Virgin, and Dorcas clothing the naked. The portions of the lights above and below the subjects, as well as the tracery, being filled with rich grisaille ornament of an Early English character. The window was designed and executed by Messrs. Warrington & Co., of Fitzroy-square.

**REVERENDS, CHROXEN CHURCH, UTOXETER.**—A reredos panel in Hutton's chancel mosaic has been erected in this church. It is designed on the lines of a Medieval enamel. Three panels containing the sacred emblems are surrounded by a rich border in a blue harmony of colour, and the whole panel is covered with the rich and varying lines of the metal cloisons.

#### FOREIGN AND COLONIAL.

**THE CONSTANTINOPLE MUSEUM.**—The Constantinople Museum, in which are stored all the rich archaeological treasures found in the Turkish Empire, is having a new wing added to it. Here is to be mounted the splendid sarcophagus found at Sidon, together with other interesting finds. The former is said to have contained the remains of Alexander the Great. Hamdi Bey, the well-known director of the museum, will publish an illustrated pamphlet upon it. By the by, in the same locality in which the sarcophagus was found, it is said that a cavern has recently been discovered containing five beautiful sarcophagi, which will also be removed to the Turkish capital.

**INDUSTRY AND ART EXHIBITION IN NAPLES.**—An industrial art exhibition is to be held in Naples in the new arcade called the Galleria Umberto I., and which will be opened about the middle of August.

**FRANCE.**—In concert with the Post-office authorities, the French Administration is considering the laying of a new telegraph cable between France and England. At one of its recent sittings the Municipal Council of Lyons has taken in hand the organisation of a Universal National and Colonial Exhibition to be opened in May 1892.

A few days since there was inaugurated at Perpignan a memorial statue to Rigaud, the celebrated portrait painter of the seventeenth century, who was born in that town in 1659. The statue, of which a plaster model was exhibited in the Salon of 1889, is the work of M. Gabriel Farci. A "casino municipal" is to be erected at Royat.

M. Camille Saint-Saëns has just presented to the town of Dieppe his collection of furniture, &c., which will be placed in a museum bearing his name. The Emperor of Russia has contributed 1,000 francs towards the statue of the sculptor Houdon, to be erected at Versailles. Many of Houdon's most remarkable works have found a home in Russia. The statue, which is the work of M. Tony Noël, will be inaugurated next spring. A bust of Théophile Gautier is shortly to be put up in the town of Tarbes. The Familial des Sciences at Lyons is about to build an important institution of maritime biology at Tamaris (near Toulon) on a site which has been presented for this object. There has been a competition at Lausanne for the erection of a building to contain the artistic and scientific collections of the town. The first premium was not awarded; the second and third were both awarded to French architects, M. Gaspard André and M. Demierre respectively.

**THE NEW TOWN HALL IN COPENHAGEN.**—The public competition for designs for a new town-hall in Copenhagen has failed in producing one that the jury could accept, and consequently the highest prize has not been awarded. However, the second prize of 5,000 kr. has been awarded to architect M. Nyrop, and two more of 3,000 kr. each to other architects, with an extra prize of 2,000 kr. to a fourth. It has, therefore, been decided to invite the first-named architect to prepare, in conjunction with the jury, the design for the hall, with extra remuneration.

**THE THRONDHJEM CATHEDRAL.**—Visitors to Norway this summer should not fail to inspect the old Cathedral of Thronhjelm. The work of restoration has now proceeded so far that the scaffolding in the eastern nave has been taken down, so that the interior may be seen.

#### MISCELLANEOUS.

**Messrs. Matheson & Grant's Engineering Trades' Report** for the first half of the current year, says that the demand for all kinds of engineering products, which grew so rapidly during the whole of 1889, appears to have culminated early this year, and now, though most branches of manufacture are well employed at high prices, this activity is mainly due to contracts taken some months ago. The revival of trade was long in coming; it was caused by a simultaneous demand from all parts of the world not yet satisfied; and although some of the staple industries may already feel a reaction, engineers generally are assured of a steady trade for the remainder of the year. The manufacturers of bridges and roofs have been, and still are, busier than at any time during the last ten years, but though there has been advantage and profit from an increased output, the rise in price has been little more than that due to dearer labour, material, and fuel. The Colonies, India, South America, and Japan have all taken largely from this country, and a simultaneous increase in the miscellaneous demands at home will keep the principal factories busy for the rest of the year. Steel equal to from 27 to 30 tons strain is more and more replacing iron in the case of bridges, but not yet so much as was expected for roof structures. Various important works are in view which will afford employment in the early future. Public works at home have been more active than of late years, for although there are no longer great railways to be constructed, the aggregate work in railway extensions, docks, canals, and water-works has been considerable. A new trunk line from Yorkshire to London is in view, and is likely to be made. Portland cement is higher in price than in January, but though still in good demand prices do not continue to increase. Large shipments have been made to America lately, and the demand for export is still going on. At home, trade has improved, and there seems every probability of its continuing to do so for the remainder of the year. At the present time there is much uncertainty as to the price that may have to be paid for fuel (almost entirely coke from the London gas-works), which will materially affect the cost of making cement.

**NEW CLOCK FOR BOCKTON CHURCH.**—A new clock has just been fixed in the tower of this church. It is the gift of Mr. Sargeant Spinks, of Brenley, near Faversham. The order was entrusted to J. W. Benson, of Ludgate-hill. The clock shows time upon three copper dials, each 5 ft. 6 in. in diameter, and strikes the hours upon the tenor bell (weighing 12 cwt.) and the Cambridge quarters upon four others. It is made with all the latest improvements, and fitted with Graham's dead-beat and compensated pendulum.

**NORWEGIAN GRANITE.**—In a recent article in the *Christiania Morgenblad*, Dr. Hans Reusch, the well-known geologist, draws attention to the development of the Norwegian granite industry during recent years, and describes of many varieties, all of which are most suitable for architectural purposes. The varieties now quarried in Norway include the common red granite, or more correctly speaking, syenite, found near Christiania; the very cheap grey granite, from the great quarry in the Idelfjord, on the eastern shore of the Christiania fjord; a violet, almost purple, stone, found near Trondheim, on the other side of the latter fjord; and finally, rare, almost unknown stone, found near Laurvik and Frideriksværn, some distance from the latter place. This is the so-called "Labrador" granite, which is nearly black in colour, whilst in some varieties the felspar in the stone has the appearance of mother-of-pearl, which becomes especially prominent when the stone is polished. Dr. Reusch predicts for this granite a great sale abroad as soon as it becomes known, on account of its great beauty. A building is now being built in Christiania, in which some of the Norwegian granites are used with great effect.

**THE RAILWAY AND CANAL TRADERS' ASSOCIATION.**—The seventh annual general meeting of this Association was held at the Cannon-street Hotel, on Friday, the 25th ult. Mr. Alfred Lafone, M.P., presided. The annual report and a revised prospectus were approved and adopted, and the Council was re-elected and enlarged. The course of action to be adopted by the Association with respect to the revised schedules of the railways and canals of the Canal Companies was considered, and the meeting came to the decision that it was undesirable for the new schedules to be dealt with until the revision of railway rates was completed. The attention of the meeting was drawn to the importance of the Fourth International Congress on the subject of the revision of the schedules of the railways, which commenced at Manchester on Monday last. It was reported that the Association would be represented at the Congress by the Chairman of the Council and the secretary, and that the latter had contributed a paper respecting the present condition of the inland navigations of the United Kingdom, and the best means of improving them. It was resolved:—

"That, in the opinion of this Association, it is very desirable that a similar Commission, or other body, should be appointed by Parliament for the purpose of making full inquiry into the present condition of the inland navigations of the United Kingdom, and the best means for their improvement, connexion, and extension."

The revised classifications and schedules of maximum rates and charges prepared by the Board of Trade, and proposed to be applicable to the London and North-Western and Great Western Railway Companies, were considered. The Chairman related the procedure to be adopted in accordance with the Railway and Canal Traffic Act, 1888, and explained the desirability of the revised maximum rates being settled with the least possible delay. Mr. Tomlinson endorsed the Chairman's remarks, and, after a discussion, it was unanimously resolved:—

"That, in view of the time which has already been occupied in the first stages of the revision of railway maximum rates, in accordance with the Railway and Canal Traffic Act, 1888, and the procedure provided by section 24 of that Act, this Association urges the desirability of the report of the Board of Trade being in any event presented to Parliament during the present Session, and hopes that the revised classification and schedules will be submitted to Parliament during the ensuing Autumn Session."

It was stated that the Association would continue to act with respect to the revision of railway rates wholly through the Mansion House Association (Sir James Whitehead, President), with which body and Lord Henniker's Railway Rates Committee it would co-operate throughout the proceedings in Parliament.

**THE IRON AND HARDWARE TRADES' PENSION SOCIETY.**—The half-yearly meeting of this excellent charity was held at the Board-room, 185, Upper Thames-street, E.C., on Wednesday, and as Colonel Stedall, the veteran President, has been compelled by ill-health to resign, the meeting elected Mr. Howard Kennard, J.P., to the post. More than one member of the Society has been asked to accept this position, but business precluded his doing so. With the acceptance of office Mr. Kennard has thrown himself into his work with characteristic vigour, and he was prepared to announce that his self-imposed goal is to collect a lump sum of 20,000l., and to raise the normal income of the charity to 10,000l. a year. He held out no one in this trade, from the magnate to the humble clerk with a modest salary, was exempt from the obligation of contribution, and while he should expect to receive many substantial donations of 500l. or 250l., he intended to angle very closely for the thousands of small donors of a guinea or ten shillings. To this end he was executing a variety of plans, and among others a mass meeting of the trade. The usefulness of the Society only needed to be known to be amply supported. In the subsequent scrutiny of voting-papers, seven pensioners (four men and three women) were elected.



*(Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; q. for square; pl. for place; ter. for terrace; cres. for crescent; vd. for vend; &c.)*



DEVONPORT.—For rebuilding the "Ordnance" inn, Queen street, Devonport for the Plymouth Breweries

(Limited). Mr. W. N. Richards, architect, 29, St. Aubyn-street, Devonport. . . . . £387 0 0  
 Read, Birch, & Co., Plymouth . . . . . 883 0 0  
 W. Trevena, Plymouth . . . . . 380 0 0  
 G. Schellabach, Plymouth . . . . . 380 0 0  
 T. Jenkin & Son, Devonport . . . . . 374 0 0  
 Accepted.

DORKING.—For making new roads, Dorking, for the Dorking District Local Board. Mr. G. Somers Mathews, Surveyor, 55, High-street, Dorking. —————  
 (Hilltopville. Orchard-road.  
 C. Dudley, Dorking . . . . . £641 18 2     £242 14 3  
 W. Esler, Dorking . . . . . 692 18     £23 14 0  
 G. A. J. G. & Co., Dorking . . . . . 406 0 0  
 W. Eapley, Dorking . . . . . 508 8 3     £45 9 2  
 Surveyor's estimates . . . . . 550 0 0     £40 0 0  
 \* Accepted.

ELMSWELL (Suffolk).—For building proposed schools, for the Elmswell School Board. Mr. John Shewell Orchard, architect, Wimbourne House, Ipswich. —————  
 Plummer, Ratcliffed . . . . . £210 0 0  
 Orreux Colchester . . . . . 476 0 0  
 Mutley, Elmswell . . . . . 741 0 0  
 O. Andrews, Stowmarket . . . . . 734 0 0  
 Bird and Long, Stowmarket . . . . . 666 0 0  
 J. Johnson, Bury . . . . . 607 0 0  
 Hinds, Beccles . . . . . 583 0 0  
 A. Andrews, Bury\* . . . . . 583 0 0  
 \* Accepted, subject to approval of Education Department.

EPPING.—For decorative parlours and the erection of laundry, &c., for Mr. C. J. Hainsworth. Mr. Richard Peters, architect, 72, Wool Exchange, Coleman-street, E.C.4. —————  
 Palmer Bros. (accepted) . . . . . £180 0 0

EXETER.—For latrines, &c., at Board school, Paradise-place, Exeter. Messrs. Hayward, Son, & Tait, architects, Exeter:—  
 Scadding, Exeter . . . . . £270 0 0  
 Diggins, Exeter . . . . . 237 0 0  
 Stephens, Exeter (accepted) . . . . . 196 0 0

GUILDFORD.—For the erection of a residence for Mr. Richard Peters, architect, 72, Wool Exchange, Coleman-street, E.C.4. —————  
 Palmer Bros. (accepted) . . . . . £180 0 0

Exchange, Coleman-street, E.C.1.	
Newland	£955 0 0
Harris & Son	577 0 0
Gold	310 0 0
Whitburn	780 0 0
Pullen	772 0 0
Wheeler	640 0 0
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<b>HAXWELL.—</b> For additions to Medical Officer's house, Central London District Schools, Haxwell. Messrs. Jarvis & Son, architects:—	
G. G.	£456 0 0
W. Buckerdie	404 0 0
W. Wallis	347 0 0
Flew Co.,	347 0 0
Dodson & Sons (accepted)	325 0 0
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<b>HASTINGS.—</b> For additions, &c., to Board School, Waterloo-place, Hastings, for the Hastings School Board. Messrs. Elworthy & Son, architects, London- road, St. Leonard's-on-Sea:—	
Taylor Bros., Hastings	£386 0 0
F. W. F. Anderson, Hastings	355 11 0
C. E. Arman, Hastings	350 0 0
A. D. Womersley, Hastings	340 0 0
A. H. Snow, Hastings	313 0 0
T. Whillier, St. Leonard's	295 0 0
E. Bonface, St. Leonard's (accepted)	256 0 0
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<b>HASTINGS.—</b> For building Board School for boys at Hastings, for the Hastings School Board. Mr. F. H.	

J. Longley & Co., Crawley .....	£3,367	0	0
H. J. Kite, Salisbury.....	3,342	10	0

	D. B. Snow, Hastings .....	3,182	0	0
	Taylor Bros., Hastings .....	3,102	0	0
	T. Taylor, Hastings .....	3,043	0	0
	W. Small, Hastings (accepted) ....	2,944	2	0

HEREFORD.—For alterations to villa residence, St. Ethelbert-street, Hereford. Mr. W. W. Robinson, architect, 10, King-street, Hereford:—

	T. Lodge .....	4369	0	0
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W. P. Lewis & Co.	956	0	0
W. Bowers & Co.	950	0	0

Beavan & Hodges (accepted) . . . . .	795	0	0
[All of Hereford.]			

HEREFORD.—For erecting villa residence, Aylestone hill, Hereford. Mr. W. W. Robinson, architect, 10 King-street, Hereford:—

W. Cullis .....	£3,000	0	0
Beavan & Hodges .....	2,740	0	0
J. Davies .....	2,680	0	0
W. P. Lewis & Co. ....	2,575	0	0
W. Bowers & Co. ....	2,650	0	0
T. Lewis (accepted) ..	2,535	0	0

[All of Hereford.]

HEREFORD.—For shop-fronts and alterations, King street, Hereford. Mr. W. W. Robinson, architect, Hereford:—

W. Bowers & Co. ....	£490	0	0
Beavan & Hodges .....	485	0	0
J. Davies .....	485	0	0

W. P. Lewis & Co. (accepted) .....	425	0	0
[All of Hereford.]			
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HOLSWORTHY (Devon).—For repairing church and tower (damaged by lightning), at Holsworthy, Devon for the Rector and Churchwardens. Messrs. Hooper, architect, Hatherleigh, N. Devon:—			
T. Slee, Sutcombe .....	£183	6	0
W. Pethrick, Hatherleigh .....	129	0	0
Wm. Wiffen, Holsworthy (accepted) .....	125	0	0



## COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENT.

## COMPETITION.

## CONTRACTS.—Continued.

Nature of Work.	By whom Advertised.	Premium.	Designs to be delivered.
Public Baths and Washhouses, Ilminster	The Commissioners	50, 20, & 10 Guineas	Sept. 17

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Road Works, West Hill	Reading S.A.	A. W. Perry	Aug. 5
Additions to School, Boreham	Belcher & Co.	John Williams	do.
Roadmaking, Rhyll	do.	R. E. Hughes	do.
Bridge, Road Station, Milford, Normanton	do.	Official	do.
Widening Roads	do.	do.	do.
Do. Footbridges	do.	do.	do.
Houses, Stable Workshop, Boreham	do.	do.	do.
Two Mangies, Canterbury	do.	do.	do.
Reconstruction of Bridge, Ux	do.	do.	do.
Chimney Shaft	do.	do.	do.
The paring Works	do.	do.	do.
Passenger Station, St. Mildred	N. E. Railway	Wm. Bell	do.
Road Works, St.	do.	do.	do.
Ter Moetan Bridge, (300 yards)	do.	do.	do.
Grider Bridge, River Ruyne	do.	do.	do.
Sewerage Works	do.	do.	do.
Granite Paving	do.	do.	do.
Excavations, Roadside, (500 yards)	do.	do.	do.
Watch-house and Boat-house, Avonmouth	do.	do.	do.
Construction of Concrete Sea Wall	do.	do.	do.
Sewerage Works	do.	do.	do.
Painting at School, Bantled	do.	do.	do.
Ten Houses, Boreham, Corbridge	do.	do.	do.
Shop, Hafford	do.	do.	do.
Street Bridge, Avonmouth, River	do.	do.	do.
Parish, near Westcott	do.	do.	do.
Renovation of Chapel, Boreham, Devon	do.	do.	do.
Renovating shaft, West Calder, N.B.	do.	do.	do.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Cemetery, Chapel, Lodge, Roadmaking, &c.	Crumphall Local Bd.	Henry Lord	Aug. 11
Congregational Church, School, Boreham	do.	do.	do.
Leeds, near Leeds	do.	do.	do.
Three Villas, Dyson, Powis, Cardiff	do.	do.	do.
Leicester, near Leicester	do.	do.	do.
Masonry and Abutments to ditto	do.	do.	do.
Enlarging Caisson, Waltham	do.	do.	do.
Fourty-four Cottages, near Sunderland	do.	do.	do.
Widening Bridge, Reading	do.	do.	do.
Removal of Roof, Building, Versadale	do.	do.	do.
Waiting-rooms, and Offices, Oxford	do.	do.	do.
New Metal Room	do.	do.	do.
Pipe works, &c.	do.	do.	do.
Brick Tower	do.	do.	do.
New Premises, Dublin	do.	do.	do.
Additional Infirmary, &c.	do.	do.	do.
Church, Huddersfield, near Farnborough	do.	do.	do.
Enlargement of Workshop	do.	do.	do.
Fixing and Road Works	do.	do.	do.
New Schools	do.	do.	do.
1,000 Yards of Cleft Oak Pale Fencing	do.	do.	do.
Engineering Works—Baths and Washhouses	do.	do.	do.
Metal Pipes, &c. (1,250 yards), Rybop	do.	do.	do.
Methodist Church and School, Southside	do.	do.	do.
Elms	do.	do.	do.
House, Armlay, Kent	do.	do.	do.
Concrete Floors (2,000 yards)	do.	do.	do.
Additions to Inn, Bitham	do.	do.	do.
Three Ornamental Shelters on Promenades	do.	do.	do.

## PUBLIC APPOINTMENT.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
Clark of Works	Willenden Local Board	4 Guineas	Aug. 12

Those marked with an Asterisk (\*) are advertised in this Number. Competition, p. 11. Contracts pp. 11. and 12. Public Appointment, xvi.

IVY HATCH (Kent).—For stabling and additions to "Beacon's Mount," Ivy Hatch, Kent, for Messrs. Mr. Edwin T. Hall, architect, 57, Moor-gate-street, E.C.

Patrick & Son ..... £1,479 0 0  
Langdale & Hallett, Brompton-road, S.W. (accepted) ..... 1,419 0 0

LINCOLN.—For providing and fixing thirty water-closets at the old Mill Barracks, Lincoln, for the Lincolnshire County Council Committee. Messrs. Goddard & Son, surveyors, Lincoln:—  
H. S. & W. Close ..... £141 0 0  
B. Footitt ..... 135 12 6  
C. Harrison ..... 135 0 0  
C. Morgan ..... 130 0 0  
S. Horton ..... 123 0 0  
G. Horan (accepted) ..... 111 0 0  
(All of Lincoln.)

LONDON.—For residence at Upper Norwood, S.E., for Mr. Jas. Epps, jun. Mr. Edwin T. Hall, architect, 57, Moor-gate-street, E.C. Quantities by Messrs. Evans & Deacon, 1, Adelaide-street, W.C.:—  
Langdale & Hallett ..... £5,900 0 0  
Wright ..... 5,245 0 0  
Foster & Dicksee ..... 4,885 0 0  
Toms ..... 4,857 0 0  
Marriage, Croydon (accepted) ..... 4,550 0 0

LONDON.—For the erection of three detached houses, at Westcombe Park, Blackheath. Messrs. J. Bullers, Boreham, Corbridge, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 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**1 ST. MARY CRAY (Kent).**—For four cottages and stabling at Hookenden, St. Mary Cray. Messrs. Haslam & Son, architects:—  
Taylor & Son ..... £938 0 0  
Bulter ..... 784 0 0  
Knight ..... 747 0 0  
Lewis ..... 650 0 0

**SANDIACRE (Derbyshire).**—For erecting pumping-station at Sandiacre. Mr. W. H. Radford, engineer:—  
W. Hasleley ..... £378 0 0  
Whately & Mankie ..... 376 0 0  
E. Keeling ..... 368 0 0  
G. Bell & Son ..... 363 0 0  
E. Hind ..... 340 0 0  
A. Fankle ..... 327 0 0  
J. Hodgson & Sons ..... 323 0 0  
F. Warrant ..... 315 0 0  
J. W. Priestley ..... 302 5 0  
J. J. Adams ..... 300 0 0  
J. Hutchinson ..... 300 0 0  
T. Cuthbert ..... 299 10 0  
A. Pollack ..... 299 0 0  
W. E. Shaw ..... 299 0 0  
J. Cooper ..... 296 18 0  
Gilbert & Gabbitts ..... 285 5 0  
J. Overcro (accepted) ..... 282 0 0

**SHARLSTON (Yorkshire).**—For the construction of sewerage and sewage works, for the Wakefield Union Rural Sanitary Authority. Mr. Arthur Fawcett, Engineer and Surveyor, Old Town Hall, Wakefield:—  
J. Bainton, Batley ..... £1,717 4 10  
G. Summers, Wakefield ..... 1,690 1 0  
F. Eyre, Sheffield ..... 1,623 8 3  
T. & G. Wilson, Wakefield ..... 1,464 7 9  
Wm. Doleman, Dewsbury ..... 1,420 14 8  
J. Singer, Cleckheaton (accepted) ..... 1,318 15 0  
M. Arundel, East Ardsley ..... 1,236 16 2  
(Engineer's estimate, £1,474.)

**SOUTHAMPTON.**—For new road, sewers, surface-drains, &c., on an estate at Northam, Southampton, for the National Land Corporation, 18, Adam-street, Adelphi, W.C. Messrs. Lemon & Hilary, engineers:—  
J. W. Roe & Co., Southampton ..... £790 0 0  
A. Chafen, Southampton ..... 769 0 0  
J. Butt, Southampton ..... 730 3 5  
John Crook, Swallowing, Southampton ..... 733 0 0  
\* Accepted.

**STAFFORD.**—For laying down a water-main and connecting same with the workhouse at Stafford, for the Guardians of the Stafford Union:—  
Thos. Goodwin, Stafford ..... £215 0 0  
Thos. Tull, Stafford ..... 215 0 0  
F. Eopley, Stafford ..... 194 2 0  
Rudge & Griffith, Stafford (accepted) ..... 187 7 0

**TONBRIDGE (Kent).**—For the erection of new wards, &c., at Tonbridge Union Workhouse. Mr. V. Oakley, architect, 35, Mount Pleasant, Tunbridge Wells:—  
Geo. Mansfield & Son, Tunbridge Wells ..... £5,340 0 0  
J. Longley & Co., Crawley, Sussex ..... 5,136 0 0  
G. & F. Penn, Pembury ..... 5,065 0 0  
G. H. Deane & Son, Deal ..... 4,892 0 0  
H. Adams, Tunbridge Wells ..... 4,693 0 0  
G. E. Wallis & Son, Maidstone ..... 4,677 0 0  
G. J. Jones, Tonbridge (accepted) ..... 4,560 7 4

**TRURO (Cornwall).**—For the erection of new parochial schools in Fydar-street, to accommodate 300 children, for the Building Committee of St. Mary's Schools, Truro. Messrs. Henderson & Sons, architects, 31, Lemon-street, Truro:—  
James Julian, Truro (accepted) ..... £2,600 0 0

**WATCHET (Somerset).**—For erecting a detached residence for Mr. Wm. Stoute, junr. Mr. Herbert J. Jones, architect, Bristol:—  
Wm. Church, Bristol ..... £2,637 0 0  
Cowlin & Son, Bristol ..... 2,593 0 0  
G. Humphreys, Bristol ..... 2,409 0 0  
Thos. R. Lewis, Bristol ..... 2,480 0 0  
H. W. Pollard, Bridgewater ..... 2,330 0 0  
Cribbott & Sons, Wilton ..... 2,325 0 0  
G. H. Pollard, Taunton ..... 2,230 0 0  
A. Poole, Ilminster (accepted) ..... 2,109 0 0

**WINSFORD.**—For supplying 640 tons Penmaenmawr road-metal, for the Winsford Local Board. Mr. Joseph Waring, Surveyor:—  
Brundrit & Co., Runcorn ..... s. d.  
Darbishires & Co., Penmaenmawr ..... 8 9  
\* Accepted.

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# The Builder.

VOL. LIX. No. 253.

SATURDAY, AUG. 6, 1897.

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Oxford: Magdalen Tower, from Bridge.—From a Drawing by Mr. J. Falleylove .....	Double-Page Ink-Photo.
Oxford: Christ Church Cathedral: Interior View of Choir and Lantern, from North Transept .....	Single-Page Ink-Photo.
Oxford: Church of St. Mary-the-Virgin: Exterior View, from the North .....	Single-Page Ink-Photo.
Oxford: New Examination Schools: Upper Hall and Staircase.—Mr. T. G. Jackson, Architect .....	Double-Page Ink-Photo.
Oxford: New Buildings, Corpus Christi College.—Mr. T. G. Jackson, Architect .....	Single-Page Ink-Photo.
Oxford: New Examination Schools: Centre facing Quadrangle.—Mr. T. G. Jackson, Architect .....	Single-Page Ink-Photo.
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## Oxford.



AMONG architects and archæologists there seems to be quite a run this year on Oxford. The British Archæological Association, as recently reported in our columns,\* have made it the centre of their annual meeting; the Architectural Association took a hurried and scrambling day there as one of their vacation visits; and the same society has fixed upon Oxford and the surrounding neighbourhood as the scene of that more important function, the Annual Excursion, which occupies a week, and which is usually the occasion of much sketching and of a critical examination of the architectural characteristics of the buildings visited, ancient and modern, quite distinct from that more hunting after antiquarian lore which characterises the archæologist *pur sang*; and which, to say truth, is often joyfully pursued on a very meagre basis of architectural knowledge. The Architectural Association Excursion, which takes place during next week, is therefore the most interesting to us of this series of Oxford visitations, and the one to which we are devoting, this week and next, such special illustration of architectural Oxford as we are able to give.

It was suggested not long since by an enthusiastic member of a certain society of enthusiasts, that the value of the old buildings in Oxford was greater to the world than

that of any of the studies which had been carried on in them; an opinion to which, though it be our business and pleasure to exalt architecture, we hardly feel able to subscribe *sans phrase*. Is the Bodleian building, truly, of more value than the Bodleian books? Put in the more moderate and general way in which it is put by Mr. Lang in his charming book on Oxford\*, it is nevertheless true that the surroundings of Oxford life are among its strongest and best influences for happiness, and those which are most certainly to be felt. Landor, one of the brilliant but rebellious sons of Oxford, thought that the pleasantest and most profitable hours he could remember at the University were passed with a chosen friend "in the Magdalen-walk by the half-hidden Cherwell." "Hours like these," adds Mr. Lang, "are indeed the pleasantest and most profitable that any of us pass at Oxford. The one duty which that University, by virtue of its very nature, has never neglected, is the assembling of young men together from all over England and giving them three years of liberty of life, of leisure, and of discussion, in scenes which are classical and peaceful." And certainly the buildings play a not unimportant part in this "classical and peaceful" scenery.

To the habitual dweller in Babylon, paying but an occasional passing visit to Oxford, there is a curious dual feeling of contrast between the capital and the fair University city. One is struck equally by the small extent of Oxford, and by its character of distinction within that extent. Coming straight from London, Oxford seems, in comparison with its fame, a mere pocket city, where

everything is close to everything else, and it is but a few minutes' stroll from Christ Church on the south confines to Balliol and St. John's on the north; Keble forming a kind of *ultima Thule* a quarter of a mile further out, "at the back of the north wind." But it is in part owing to this small scale of Oxford that the city has that air of distinction which is so remarkable. In a larger town the University buildings would in all probability have been more scattered, and would at all events have been less dominant. As it is, the secular town of Oxford, apart from the University, is of such small account that we seem to be in a town composed entirely of dignified or picturesque buildings with lawns and gardens interposed. Cambridge, which comes of course the nearest to it, does not present anything quite like this, from the more scattered manner in which the colleges are placed; and Cambridge, again, has no High-street in the sense that Oxford has. It is true that people coming to Oxford for the first time, and entering "The High," as nearly every one does in these railway days, from the western end nearest the railway station, will probably experience a little shock of disappointment at the first sight of the street which enjoys such a world-wide fame. It looks narrow, the Mitre Hotel is not as picturesque as we expected, and All Saints, from this point of view at least, is not a very noteworthy specimen of architecture. But by the time the visitor has got down past the bend of the street, and looks back up it, with St. Mary's and All Saints' towers standing out separately in the view, the quiet and reposeful street fronts of University and All Souls forming contrasting horizontal lines, and Hawksmoor's heavy but wistful grandiose

\* "Oxford: Brief Historical and Descriptive Notes." By Andrew Lang, M.A. With illustrations. London: Seeley & Co.: 1890.

\* See *Builder* for July, 12, 19, and 26.

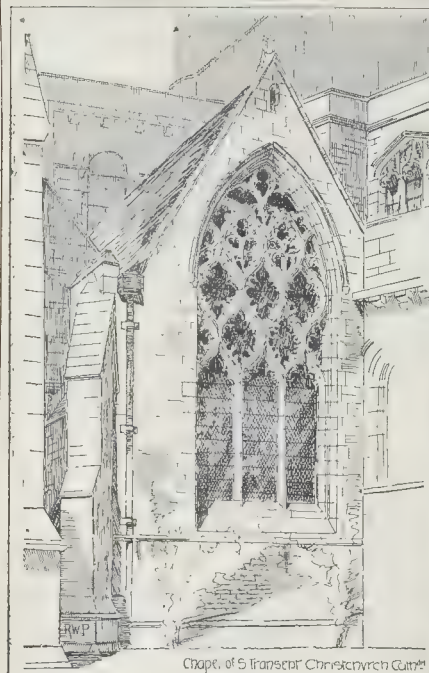


Fig. 1.

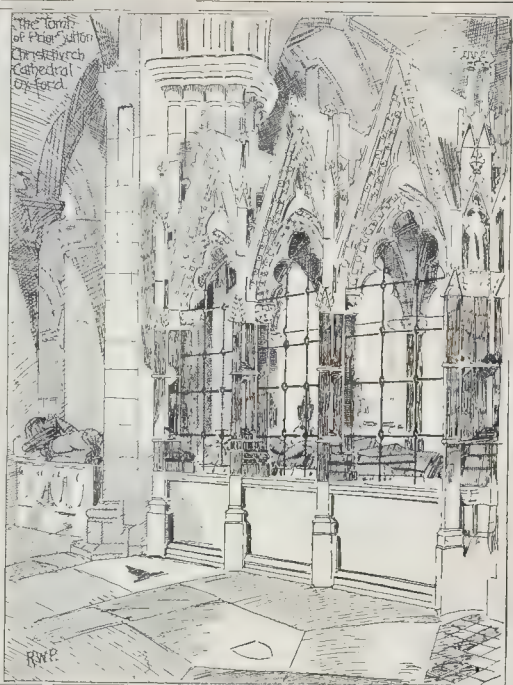


Fig. 2.

Queen's gateway as a foreground object on his right, he will probably admit that Oxford High-street deserves all that has been said about it. But to realise a striking first impression of Oxford every one visiting it for the first time ought to go by a round-about route and drive in over Magdalen-bridge, at the east end of the town, with Magdalen College and Tower on the right, and the High-street and St. Mary's and All Saints' towers opening out as he advances. Mr. Fulleylove's sketch of Magdalen Tower from the other side of the bridge, a reproduction of which is published in this number, shows the first view of Oxford entering from this side, the sketch being taken from the western or further side of the bridge from the town, instead of from the point on the bank exactly opposite the tower east of the bridge, which is the more usual point of view. This view as taken here makes the better composition, though we could have wished to have had the tower in its normal state, without the realistic detail of the apparatus of reparation which appears to have been going on at the time the drawing was made. The view is nevertheless of special interest as the work of an artist who has gained a somewhat exceptional position as a painter of the picturesque of old buildings. Another of the main features of High-street, the tower and spire of St. Mary's, is also given among our illustrations of this week. The most noticeable points architecturally about St. Mary's tower are the rich effect produced by the double pinnacles at the base of the spire, and the generally pyramidal composition of the whole; the large buttresses with their numerous set-offs, spreading outwards towards the base, giving a remarkable solidity and monumental character to the whole.

Next to the view down (or up) the High-street, perhaps nothing in Oxford is so characteristically Oxford as the small square in which stands the Radcliffe Library flanked by All Souls' screen on the one hand and Brasenose on the other, and

• A drawing of the upper portion of Magdalen tower without the scaffolding, &c., will be given in our next.

backed by the square mass of the Bodleian. The mere view of this group of buildings caught, in passing down the High-street, through the narrow lanes west and east of St. Mary's Church, is sufficient to awaken curiosity and interest, so unique is it, so unlike anything to be seen in any other town in England. The comparatively small scale of Oxford is noticeable here too; for probably there has been no visitor who, knowing Gibbs's famous domed library by engravings only, has not been surprised at finding the actual building smaller than he had expected. In every other respect it is a building that bears out its reputation; somewhat cold and formal perhaps, but essentially dignified. Perhaps it suffers nothing in this respect from its contiguity with the rather nondescript and corrupt architecture of the large quadrangle of All Souls, an inspiration of Hawksmoor's in which he was by no means so happy as in his entrance and screen to Queen's College. In the latter he kept within the lines of a style which he understood and in which he could show his best qualities; in All Souls he made an unhappy attempt at a kind of Gothic outline built up with Classic details; a thing which can be done, no doubt, but Hawksmoor was not the man to do it; his hand was not light enough nor his taste in detail sufficiently refined, and he has succeeded only in producing a kind of nondescript architecture which is striking in a general way and as part of the *coup d'œil* at this point, but which looks less desirable the more it is examined in detail.

If Radcliffe-square furnishes the most characteristic and unusual architectural effect in Oxford, the visitor has only to recross the High-street and penetrate a little distance to the south of it to come upon the most sumptuous and palatial of the University buildings, the great quadrangle of Christ Church, which architecturally is to Oxford what Fountain Court, Trinity, is to Cambridge; architecturally only, for no one college at Oxford holds intellectually the "pride of place" which Trinity holds at Cambridge; if there be any Oxford College which can pretend to intellectual precedence it would probably be

Balliol, which architecturally is not of special account except in regard to the space it covers. A quadrangle on such a scale as that



Fig. 3.

of Christ Church must produce a fine effect whatever the surrounding architecture, which in this case is not of the highest interest as regards the quadrangle façades, with





Fig. 4.

Magdalen College, Oxford.



Fig. 5.

the exception of Wren's picturesque though corrupt-looking tower over the main entrance. Like the great court at Trinity, Christ Church has no cloisters, though the bases of the buttresses for the cloister are all *in situ* and show what a sumptuous piece of work was intended. This, however, would hardly have been an entire architectural success in one sense, in that it would have been a projecting cloister, an addition to the main line of building, which has not so fine an effect as a

cloister forming the ground story of a building which is continued over it, at all events not in a residential building; in a cathedral the conditions are somewhat different.\* But one of the treasures of the ancient architecture of Oxford is found in the Cathedral, now the College Chapel, as adapted and altered for

\* It may be of interest to note here that we gave a view of Christ Church College, from St. Aldates, (from a drawing by Mr. John Fulleylove), in the *Builder* for February 9, 1886.

that purpose by Wolsey, the founder of the college, who lived before the days of an S.P.A.B. Society, and, like the gentleman mentioned in that Society's last Report, "altered things as he and his architect thought fit." We give a sketch of a portion of the Cathedral (see lithograph) showing the remarkable contrast between the late Norman work of the sub-structure and the rich effect of Wolsey's (?) fan-traceried and pendants roof; also the interesting character of the transitional foliage of the capitals, showing the germ of the forms of Early English foliage while still in their state of stiff young sprouts, retaining (see the lower leaves of the foreground capital) some reminiscence of the classical leaf from which they originated, and before they took to the free curling crisp forms of their mature growth.

In the subjoined cuts, fig. 1 shows the window of the chapel in the south transept, which is similar to the work in the chancel at Dorchester Abbey (a building also included in the week's proceedings of the Architectural Association); and fig. 2 is a sketch of the tomb of Prior Sutton in the Cathedral, a good example of a tomb of that date, with Purbeck shafts and very delicately carved caps, sketches of some of which are given in fig. 3. The tomb stands in one of the bays of the arcade between the north choir aisle and the "Latin Chapel" (so-called because the College prayers in Latin were formerly read there at the commencement of each Term). In the Latin Chapel itself are some good poppy-heads, one of them with the head of Cardinal Wolsey. Two of



Fig. 6.

these are shown in the right-hand corner of the photo-lithograph of various sketches which forms one of the separate plates in this week's issue (see plate).

The quadrangle of Peckwater, a portion of Christ's College, though having no relation architecturally to the large quadrangle, may be called in its present state a fine gloomy example of Classic architecture applied to a building of this class. The library is a really powerful work of its class, simply on account of the boldness of its parts and projections; there is nothing little or trivial about it, and perhaps the blackened and decayed state of the stone does not diminish its dignity of effect; but the extent to which this and other Classic work of earlier date in Oxford (notably Inigo Jones's work at St. John's) has decayed is rather serious, and looks as if repair or partial refacing would become a necessity before long, however much one may regret to touch the old work. Certainly Peckwater quadrangle at present is a somewhat gloomy spectacle, stately but rather grim in its decay.

Though Magdalen is inferior to Christ Church in extent, it surpasses the latter in the possession of so fine a tower, and in general picturesqueness, and many critics are disposed to place it first among the architectural attractions of Oxford. We give some further sketches of parts of the Magdalen buildings. Fig. 4 shows a portion of the large quadrangle with the bell-tower in the rear, and the stone pulpit is seen just inside the gate, from which formerly a sermon was preached on St. John Baptist's



Day, the open-air delivery of the sermon having, we are told, a reference (somewhat distant, it must be confessed) to the circumstance of St. John the Baptist preaching "in the wilderness." Fig. 5 is a sketch of the "Founder's Tower" with the sumptuous oriel window of the Founder's Chamber, a room which has witnessed the entertainment of not a few guests of note in history, royal personages and others. The doorway below, leading to the cloisters, has some beautiful carved work in the spandrels. Fig. 6 is a sketch of the old Singing School, a most characteristic bit of domestic Gothic architecture, remarkable, however, for its repose and simplicity rather than for more ostentatious qualities. It is seen again in the corner of the ink-photo illustration showing the new buildings of Magdalen. It is this character of repose and absence of ostentation which is for the most part so remarkably exemplified in the old University buildings both of Oxford and Cambridge, and which it seems so difficult for those who are called on to add new buildings to retain. In this particular case it may be said that Messrs. Bodley and Garner have been successful; their new buildings are not out of keeping with their surroundings further than every new building among old ones must unavoidably appear to be; and other similar examples are to be found; but of the modern buildings of Oxford collectively we have a word to say further on.

A near neighbour of Magdalen, Merton College, has also some affinity with it architecturally. The tower, shown in the sketch of the chapel in the lithographic plate, is not dissimilar to that of Magdalen in the treatment of the upper stages, though much shorter in proportion. The College was founded by Walter de Merton in the time of Henry III., and the chapel, of which the fine east window is shown in the sketch, was, like Christ Church Cathedral, an older church metamorphosed for the College Chapel by the founder. The east window and the rest of the choir are, however, Walter de Merton's work; the remainder having been formerly the Parish Church of St. John the Baptist. In the chapel is the brass lectern presented to the college by "Master John Martock," of which a drawing is also given; and we have added on the plate, what will be of interest in this connexion, a drawing of the memorial brass to this same John Martock, which still exists at Banwell in Somersetshire. A window of the library at Merton, given on the same plate, is a noteworthy specimen of that mingling of Classic detail with Gothic feeling which is so frequently met with in the old work at Oxford; the cornice round the window is Classic, but the arrangement of the mullions and the slightly-pointed arches to each compartment, with the battlemented ornament on the upper side of the transom, are distinctly Gothic, though of a very late type.

Among the colleges north of High-street, New College has a special architectural interest in the mere fact that it was founded by William of Wykeham, who doubtless influenced its architectural design more or less. Its Bell-tower, a view of which will appear in our next week's illustrations, is notable for its remarkably massive and plain character, rendering it more like an adjunct to a fortress than to a University building; but this special character, if somewhat out of keeping with its purpose and surroundings, at all events serves to give it a special interest. In connexion with New College we add also (see lithographic plate) a sketch of one of the most curious and interesting of the misere carvings in the chapel.\*

North of that remarkable architectural group, referred to before, of which the Radcliffe is the centre, the east end of Broad-street, with the Sheldonian Theatre and the old Clarendon, is another most characteristic Oxford bit. In the *Builder* for Jan. 5, 1889, was published a view looking westward along Broad-street, with the columns of the Claren-

don Portico in the foreground: an admirable view in a picturesque sense; but the most specially characteristic feature, the apex of the Sheldonian Theatre, with its concentric range of quasi-Classic colossal heads on "terms" forming part of the balustrade of the theatre, is lost from this point of view. The heads, to say truth, are rather a piece of "bunkum," but they form an unusual incident in street architecture which one would be sorry to lose. The portico of the Clarendon, like other Classic work of its date in Oxford, such as Peckwater Library, impresses one at once with its boldness of scale (in its parts, for it is not actually large) and its weather-worn condition.

But to find the gem of Renaissance architecture in Oxford we must follow Broad-street westward, and turn up past the angle of Balliol to St. John's College, enter the second quadrangle, and turn round to view the sadly faded though once sumptuous work by Inigo Jones. His work is seen along the east and west sides, the more emphasised by contrast with the plain Elizabethan building on the north and south sides. There is nothing in Oxford to equal these two façades by Inigo Jones in grace and richness of detail, nothing that so clearly bears the stamp of artistic genius. It is a kind of work that one would far more expect to find in Italy than in England; there is a richness and profusion in the decorative detail which seems redolent of the full bloom of the Florentine Renaissance. The decayed state of much of the work, unhappily, is melancholy to look upon, and one is inclined to suggest that at all events the decayed parts of the fluted columns might as well be carefully cut out and refaced, this being more or less mechanical work in which the intrusion of the modern hand would not be so much felt. The decorative work it would be wrong to touch; it must retain its own faded and weather-stained beauty; but the columns seem to have suffered most, and will best bear repairs. If anything were done of this kind, however, it should be under the most stern conservative direction, such as would hardly allow a workman to touch a single bit of stone without a written order!

The tendency to restore, we should say, has not touched Oxford severely, so far; yet Mr. Lang complains that there is always some repair of a dangerous kind going on; remarking at the same time that there is nothing about which the members of other colleges than the restoring one are so sensitive. This dual feeling is traced back as existing two centuries ago, according to the testimony of one Prideaux, of that date, who records that St. Mary's was undergoing restoration, and the old men exceedingly exclaiming against it. "That is the way of Oxford," adds her modern biographer, "a college is constantly rebuilding amid the protests of the rest of the University. There is no question more common, or less agreeable, than this: 'What are you doing to your tower?' or 'What are you doing to your hall, library, or chapel?' No one ever knows; but we are always doing something, and working men for ever sit, and drink beer, on the venerable roofs." Now really, if it is so, we must say that all the recent restoration must have been done in a very conservative spirit, for on the old buildings the marks of the cloven-hoof of the restorer are by no means much apparent to the casual visitor. A large part of the street façade of All Saints has, it is true, been lately refaced, but that is not a University building, and, after all, the architectural value of All Saints is not of the highest class, except as regards its part in the *coup d'œil* of High-street, and so far as that goes it is not injured. Mr. Fulleylove's drawing testifies that on the date of September 29, 1887, workmen "sat on the venerable roof" of Magdalen tower,—at all events their apparatus is in evidence; we presume some repairs were done to the pinnacles and battlements; but the consequences are certainly not at the present moment offensively conspicuous to the naked eye, from below at all events. There has been talk recently of

irreverent hands being laid on the Mitre Hotel, which, though not a part of the University, is no doubt a very time-honoured feature of Oxford, one of the remnants of the old High-street architecture\*; and objectors have been as solemn on the subject as if it were the very ecclesiastical institution symbolised by the Mitre that was threatened. We should be loth indeed to see so characteristic an old front demolished, but we must humbly confess our own conviction that the Mitre,—the existing building that is to say,—cannot much longer be retained: it is venerable, doubtless, but also knock-kneed and out of the perpendicular, and the rooms are very low. The rumour is that it was proposed to be purchased for the erection on its site of some new University erection. In that case the essential portion, the spirit, of the Mitre Hotel establishment would probably put on a new body elsewhere. One would be sorry to lose the old house, but there is no necessity that the new one, if built, should be such a piece of architectural vulgarity as the Randolph Hotel, for example.

And this leads us to our promised word about the new buildings of Oxford. Mr. Lang is lugubrious over this matter also, and thinks the next generation will regard the multitudinous new buildings as "imitative experiments, without style or fancy in structure or decoration, and often more than mediocrally uncomfortable." Elsewhere he observes that "the Fellows of a College at any given moment are not necessarily endowed with architectural knowledge and taste. They should think twice, or even thrice, before leaving on Oxford for many centuries the uncomely mark of an unfortunate judgment." And seeing what Oxford is, and what is her charm, it is not to be wondered at that her sons should desire to keep her unchanged. There is unfortunate evidence, too, of the extent to which people may deceive themselves as to the ultimate value of buildings which they erect with much mutual congratulation. Think of the praises that were lavished on the New Museum; how it was hailed as the evidence of a revival of the true Medieval spirit, how its carven stones were pointed to as showing the true Gothic treatment of ornament based on natural forms, &c. But a quarter of a century since, was it not? And who has a good word for it now? And Kettle College and its Chapel, within a stone's throw, are not a much happier example. The College buildings have the advantage of being less pretentious than the Chapel, less fireworky; but they are far inferior in their parti-coloured brick-work to the repose of the old (or some of the new) stone buildings. The new buildings at Balliol (about which, however, no such fuss was made) are not exactly pretentious, but they leave the impression that they would be very well as business chambers in London or Manchester; they are not of the spirit of Oxford. On the other hand, Mr. Lang's vaticinations savour a little too much of that tendency, peculiar to the literary mind, to dislike all new buildings, and to appreciate architecture by its date. We do not know that there are any among the modern Oxford buildings that are in worse taste or more pretentious than Hawksmoor's work at All Souls; it is certain there are some that are much better; but then All Souls is sanctified by the hand of Time. The examples of the New Museum and Kettle seem to indicate that the best future chance lies with those buildings which are restrained and sober in their character, and which do not attempt to strike out a marked new departure at variance with the prevalent type of Oxford work. In this respect an impartial criticism must, we think, admit that some of the new buildings of which we give illustrations in this number have fairly met the rather difficult problem. Mr. Jackson's Examination Schools, of which we give a view of a portion of the east side towards the quadrangle, has the merit of combining dignity

\* We may note here that sketches of other misere carvings in New College Chapel were given by us in our number for August 3, 1889.

\* A view of part of High-street, showing this hostelry and All Saints tower, from a drawing by Mr. Fulleylove, will appear in our next issue.



with refinement and repose of style: it is of course made up mainly of old architectural materials, so to speak, though there is a certain individuality in the detail. Of course the centre *fronton*, rising above the roof, is an illogical and contrived effect; but if we were to begin to apply that principle of criticism rigidly in Oxford, how many charming bits of old work should we have to pull down? The High-street front of the new schools is more distinctly original; we have not been able on this occasion to give an illustration of it; but we consider that on the whole the best piece of new architecture in Oxford; and that is not mere imitation. The most original portion of the building, the interior arcade of the hall, with its heavy bracketing, is to our thinking the least successful bit; there is too manifest an attempt to do something new and striking; the upper hall and arcade, of which we give a view, is far more to our mind. The same architect's new building at Corpus Christi is so curiously like old Oxford in its architectural inconsistencies, that, passing it the other day and forgetting for the moment what it was, we looked up curiously to see if it were an old building that had suffered the process of scraping. This is the effect it was probably intended to produce, and it is not every architect who can do that even when he means it; the experiment is interesting, and has been carried out with great delicacy; still one is tempted to say "something too much of this." The same criticism applies to the nevertheless beautiful range of modern buildings which Mr. Jackson has added to Trinity College, an addition of which, for refinement of design and detail, the College may well be proud; but it is rather too imitative. Mr. Champneys's angle feature to his new Indian Institute, of which we give a view, is a really happy bit of architectural invention; this turret stands at the end of Broad-street, near the north-east angle of the old Clarendon, and from its position is seen from the further end of the street. The architect may be congratulated on having added to so characteristic a portion of Oxford a new architectural feature which, though small, is both picturesque in itself and in harmony with its surroundings.

While, however we consider that the outcry in some quarters against the new buildings in Oxford, or against any new building at all there, has been pushed to an illogical and uncritical extreme, and that some of the recent additions to Oxford architecture merit a great deal of praise, we are quite in sympathy with those who deprecate all changes in Oxford that can be reasonably avoided. Like Venice to Europe, so Oxford to England is a completely unique possession left to us from the past. Let us at least preserve it as long as we can.

#### DR. PUCHSTEIN ON THE PARTHENON MARBLES.

**H**OWEVER uncertain much of the history of Greek art might be, one truth we had all thought stood safe and sure, that the Parthenon Marbles, though not indeed all actually sculptured by the hand of Pheidias, were designed by him and executed under his immediate supervision, and hence that for a knowledge of the style of Pheidias these Marbles were our principal and, indeed, only original source. This conviction is as old as the days of Visconti, and dates from the day he visited the Marbles in Burlington House before they were bought by the nation. He writes to Hamilton (November 25, 1814) "En visitant les marbres sculptés que mon lord Comte d'Elgin a fait transporter d'Athènes à Londres, le connaisseur est certain d'avoir sous les yeux plusieurs de ces ouvrages précieux qui conçus et dirigés par Pheidias et exécutés en partie par son ciseau, ont fait pendant plus de sept cents ans l'admiration du monde ancien." Visconti seems to agree with Cicero: *Phidias signum simul adæptum et probatum est*. The grounds of his con-

viction are in the main subjective, and such arguments are hard to disprove. Sanctioned moreover by the tradition of more than half a century, they are peculiarly difficult to combat,—a doubt as to the connexion of Pheidias with the Parthenon Marbles will with many only raise a contemptuous smile.

None the less, Dr. Puchstein comes boldly forward to state, not merely a doubt, but his own conviction of the contrary,—i.e., that the Parthenon Marbles are not merely executed but designed by a sculptor substantially later than Pheidias, and of a style markedly different.

He does not state what raised the question in his mind, but it is easy to see, in reading his paper just published in the *Jahrbuch of the Prussian Archaeological Institute* (V. 1890, 2), that the doubt first occurred to him owing to his study of the copy of the Parthenon which was discovered during the Pergamene excavations. Setting aside Visconti's purely subjective argument, it has been usual to base the Pheidian connexion on two passages, in Pausanias and Plutarch respectively. In describing the Parthenon, Pausanias (1, 24, 5) mentions the pediment sculptures and an undoubted work by Pheidias immediately together, without naming the sculptor. This, it is presumed, is because the authorship of both was too well known to need statement. Such an argument, of course, considering the accidental way in which Pausanias names or leaves nameless the artists of the work he describes, is practically *nil*. Plutarch's statement is at first sight more serious. In his life of Perikles (C. 12 and 13), in describing the extraordinary artistic activity of the rule of Pheidias, he says, "that although each work had its own architect and artist, and those of the first rank like Kallikrates and Iktinos, Mnesikles, &c., yet Pheidias had the supervision of them all (*πάντα διέτελε*) and everything was well nigh dependent upon him (*πάντα ἢ ἐξ αὐτοῦ ἢ ἀπ' αὐτοῦ*). As the friend of Perikles he kept an eye over all the works and the artists (*πάντα ἐπιβλέπων ἢ πάντων ἐπιστάτης τοῖς ἑκαστοῖς*). But he himself erected the gold and ivory statue of the goddess." Now here, if anything is insisted on, it is this, that Plutarch distinguishes between the work Pheidias did himself (i.e., the gold and ivory statue) and the work done by other artists, on which he kept a friendly, supervising eye; hence it may fairly be concluded that so far as literary evidence goes we have no hint whatever as to who *did* design and execute the marbles of the Parthenon, but a pretty clear inference that Pheidias did *not*. Our only source of knowledge, then, is a comparison of the style of work of art known to be by Pheidias with that of the Parthenon marbles. As all the actual works of Pheidias have perished, we are further reduced to an examination of well authenticated copies and of literary statements describing statues and compositions. Further, as the copies of the Olympian Zeus (on coins) are too small to exhibit details of technique, practically we are limited to the copies of the chryselephantine Parthenos and the design on its basis.

Here Dr. Puchstein's argument bifurcates;—he takes first the question, is the treatment of the drapery of the Parthenos,—as seen in copies,—such that it could possibly have been executed by the same hand that did the drapery of the Parthenon marbles; secondly, is the style of composition, which we know from accounts of the relief at Olympia representing the Birth of Aphrodite and of the Birth of Pandora, on the basis of the Parthenos, such that it can possibly have been conceived by the same artist who composed,—say the east pediment or the frieze of seated gods? To both these questions Dr. Puchstein returns an unhesitating No.

Respecting the first question,—the drapery of the Parthenos,—Dr. Puchstein's argument can only be fully appreciated in relation to the sections he gives of the drapery of the Varvakeion statuette, of the Akropolis torso, and of the Dresden and Pergamon Athenes. A most careful and detailed

analysis of the scheme of folds in these statues shows that all statues which are copies of the Parthenos show analogous schemes, and these schemes are marked by a close and severe naturalism. It is a commonplace of criticism to note the idealism of the drapery of the Parthenos marbles,—it is "wie im vision gesunden," "supersensuous," and the like: in fact, it leaves on the mind of every spectator the effect of a thing non-natural, supernatural, if we like,—a thing imagined, not actually seen. We cannot predicate of one and the same sculpture a close naturalism and an extreme idealism. It is, Dr. Puchstein maintains, unthinkable that, making all allowance for difference of technique in the round and in relief, the artist who made the simple, severe, almost archaic Parthenos, could have broken loose into the imaginative idealism of the "Gaia and Thalassa": the two are not only not the same, they are not even developed one from the other, they presuppose a complete break,—a contrary impulse.

Much the same is maintained of the compositions known to be designed by Pheidias. In his Birth of Aphrodite we have a central group of three, with pairs of the gods symmetrically balancing each other side against side, and bounded at either end by Helios and Selene. How simply and symmetrically such a composition was conceived in the days of Pheidias, and by him, may be seen in the remains of the Pergamene basis, which is unquestionably a copy of the Birth of Pandora, and on which five gods still remain standing in simple order, side by side. Contrast this with the east pediment composition, where we have an analogous subject—a birth, and the birth scene bounded by Helios and Selene. Instead of a simple scheme of spectator gods side by side we have a composition of infinite complexity. Every conceivable diversity of pose, a balance of elaborate diversity, a design, in fact, wholly, fundamentally different from the old archaic scheme which we know Pheidias preserved, even while he ennobled it.

We have given only a brief résumé of the lines of Dr. Puchstein's argument—his present paper is but a first instalment—in the next issue of the *Jahrbuch* he promises a further dissertation, dealing with the more positive evidence as regards date, of the use of certain tools in the Parthenon marbles. Enough has at least been said to show that a problem of the highest importance has been laid before the archaeological world.

#### NOTES.

**M**R. E. T. HALL'S paper in the last number of the *R. I. B. A. Journal* on the subject of "Sub-contracting in the Building Trade" (apropos of some recent deputations to the Institute), is a very painstaking and clear review of the subject, though not one that is likely to give satisfaction to the members of the deputations referred to. Mr. Hall pretty conclusively shows that all sub-letting is not necessarily attended by the evils which were so eloquently lamented on that occasion. In regard to masons' work, for instance, Mr. Hall says,—

"In this trade I know of two systems of sub-letting; there may be more: (a) One is for a contractor to sub-let the stonework—labour and material—to a sub-contractor in London who makes a specialty of stonework, and has space and plant for moving and working stone; (b) the other is for the contractor to sub-let to the quarry-owner, who works the stone in the country.

Now, as to the first system, I believe that the men employed by the sub-contractor are identically of the same class as those employed by the chief contractor. Indeed one firm—whose name as large chief contractors has been well known all over the country, I mean Messrs. George Smith & Co.—take a lot of stonework by sub-contract. The fact is, their facilities for moving and working stone are so much greater than all but the largest contractors, that they can do stonework cheaper than the chief contractors under whom they work without attempting to cut down wages."

That is to say, that this is simply a question of employing contractors who, because they



do only one kind of work, have all the plant and labour for it ready to hand, and can save time and money in carrying it out. The matter, he admits, is rather different when the sub-contractor is merely the working mason; a skilled workman, but not possessing the facilities of the great firms referred to. As to the second system, that of quarry-working, Mr. Hall's reply is that "quarry-worked" stone is *not* worked at the quarry, but in masons' yards in its neighbourhood, and also as near to a railway station as possible. He adds,—

"Mr. Weighill says 'quarry-worked' means sub-contracting by 'cheap labour.' I have made inquiries of one of the largest firms of quarry-owners in England, who employ from 1,200 to 1,500 men, and am assured by them that all the stone prepared in their eight depôts is worked by hand by masons paid the highest regular rate of wages in the district. Most of their men belong to the trade union.

Mr. Weighill's observations as to 'cheap labour' and the owners' statement to me, although at first sight they appear contradictory,—are, it will be seen, quite consistent one with the other, as, of course, the rate of wages in the country is less than in London: its relation to rent and cost of living, however, being probably identical. We cannot, of course, nor would Mr. Weighill, condemn as an inferior craftsman a mason who happens to live in the country; and we cannot accept as reasonable the alternative logical inferences from the argument, either that the country-qualified mason should be paid the same as the London mason,—which would be very unjust to the London mason, who has to pay so much more for everything,—or that all stone to be used in London should be worked in London, in order to give more work to the London mason at the expense of his country fellow-workman.

As architects, we can condemn only the inferior craftsman and his workmanship. I believe all the stone for the Spanish-place Church was worked in the country by the quarry-owners. Is it inferior to work done in London by our masons?"

These and other points in Mr. Hall's paper are well worth the consideration of those who see such a bugbear in the mere fact of subletting. Whether Mr. Hall is equally successful in his reply to Mr. Robins's denunciation of competition is another question. He says that if a theatre is destroyed, hundreds of poor people are thrown out of employ; it is legitimate to try and get that place of employment rebuilt as soon as possible, and so with every other place of employment. Yes; if we are to regard architecture as a purely business matter of furnishing a building up to time. We presume Mr. Hall does regard it in that light; so do a good many other people. As we have before said, there is nothing immoral in the theory; only, high-class architecture cannot be had on that system; and some of us still think that high-class architecture is something worth having.

IT appears that our prediction that the "Removal of Gates" Bill would not be allowed to go without something in the shape of a compensation clause has been justified to a certain extent. After two somewhat lengthened discussions, the Earl of Wemyss's proviso was carried on Tuesday by a majority of 56 to 18; it runs thus:—

"Provided that if any lands shall be taken or injuriously affected by anything to be done under or by virtue of this Act without the consent of the owner thereof, compensation shall be made for the same by the Council in the manner provided by the Lands Clauses Consolidation Act, 1845, and the Acts amending the same, the provisions of which Acts, so far as relates to lands taken otherwise than by agreement and to compensation for lands injuriously affected, shall be deemed for that purpose to be incorporated with this Act."

The Earl of Wemyss expressed himself very plainly in regard to the Bill as it originally stood, pointing out that by the American constitution contracts were absolutely protected from interference by the Legislature, whereas "we had no written constitution or supreme Court in this country to protect the rights of property. Their Lordships' House was the only check on wild legislation which did away with rights of property." No doubt a certain colour was given to the line taken by the objectors to the clause, from the

fact that the Duke of Bedford, the freeholder of the property, did not take any action against the Bill; but even having regard to that fact, the tone adopted by Lord Herschell in opposing the introduction of any compensation clause appears to us perfectly inexplicable, unless there is something more behind it than appears on the surface. It is evident that the Lord Chancellor had a strong feeling on this point, from the decisive rebuke he gave to "the indirect menace" of Lord Herschell's speech, and his remark that "if the thing was right he trusted their Lordships would have the courage to do it." It is impossible to avoid the conviction that this confiscatory proposal was counted on, if carried, as a precedent in future cases of a similar nature.

ONE of the most unsatisfactory of the many strikes which are now agitating the labour world is that of the Tyne shipyard joiners. It affects only a comparatively small body of men, but the circumstances are peculiar and unusual. The dispute is an old-standing one, turning on the apportionment of work between ship carpenters (or shipwrights) and ship joiners. A similar dispute was settled at Hull, after a strike of some weeks, by representatives of the parties to the dispute drawing up a list of each others' work; but the Tynesiders, failing to come to an agreement as to the division of their respective classes of work, submitted their differences to arbitration. An award was made as long ago as the beginning of last April, by Mr. Burt, M.P., which, like most decisions of this nature, failed to commend itself to all concerned. The shipwrights, however, have repeatedly expressed their willingness to accept the award, but the joiners have persistently declined to work up to it, the climax being reached by the latter coming out on strike last week. They ask for a joint Conciliatory Committee to go into the whole question again, but the shipwrights naturally fail to see the utility of this, and it is difficult to see how the strikers can expect any faith to be placed in them after their repudiation of Mr. Burt's award. When questions are referred to arbitration in this way it is almost impossible for both sides to obtain all they want, but it is fortunately very seldom that the losing party doggedly refuse to make the best of it. This is what the Tyneside joiners appear to be doing, and as Mr. Burt has been a leading referee in disputes of this nature in the North, a severe blow would be dealt at the principle of arbitration should the example of the strikers be followed by others. It should be added that their contention is that the award was against the weight of evidence, and that the strike is the unavoidable consequence of their being unable to appeal against it in any other way.

WE recently published some correspondence on the exorbitant charges made by landlords for dilapidations. Last week a case was tried at the Sheriff's Court, London, again illustrating the unreasonable way in which dilapidations are estimated. The Dowager Marchioness of Downshire let Benfield Park, Berks, at a rental of 530*l.* a year: at the end of four years the tenancy was concluded. The first estimate for dilapidations was 2,000*l.*, but this was reduced, and the amount claimed was 1,090*l.* The jury, according to the report before us, awarded only 290*l.*! And this, though the tenant did not defend the case. Such figures as these speak for themselves. In such a case as this it is obviously those who are engaged professionally, and not the landlord, or rather landlady, who are to be blamed, since, of course, the Marchioness of Downshire could know nothing of the cost of putting the premises into tenable repair. We cannot too often state that professional men injure their profession by estimates of damages in cases of dilapidations, obstruction of lights, and compulsory taking of land or buildings

which are proved to be unreasonably high in the result.

SINCE the opening of the Forth Bridge there has been a congestion of traffic at the Waverley-station, and during the present month the utmost endeavours of the railway officials have failed in starting the through trains in proper time. It is evident that something must be done to obviate this state of matters, and it has been suggested that a loop-line should be formed by utilising the valley of the Water of Leith, which might be covered over from where it is crossed by the railway, about two miles to the west of the city, onwards to Leith Docks and from thence to the Portobello branch. The covering over of the stream would doubtless be an expensive process, but not more so than what the Caledonian Railway proposed to do in driving a tunnel along the whole length of Princes-street, Waterloo-place, and the Calton Hill. The covering over of the stream would effect a sanitary improvement, and the railway would afford facilities to the north side of the city which have long been wanted.

THE Committee of the City Corporation, under the Presidency of Sir Guyer Hunter, for inquiring into the charges for and the supply of the metropolitan water companies, has elicited some characteristic replies from the water companies, who have been invited to send official representatives to the Committee. The Southwark and Vauxhall Company said that as the Committee was wholly irresponsible "and apparently formed for supporting the erroneous views held against the Water Companies," they did not deem it expedient to take any part in the proceedings. Most of the other replies, though not all so candid as this, were practically to the same effect. The New River Company gave no reply. Sir Robert Rawlinson, in giving evidence, said he thought it was possible to vastly improve the water supply taken from the Thames, and that it might be taken from the area of the Thames basin without drawing out of the open river at all. That would be better for the water, very likely, but not perhaps any better for the Thames. In the meantime we are glad to see Sir R. Rawlinson express himself so decisively on the impropriety of allowing house-boats on the Thames while it is a source of water supply. No such thing, he pointed out, would be tolerated on the great artificial reservoirs in connexion with Liverpool and other large towns. Of course not; yet as long as the Thames is the main source of our drinking-water, the objection is just the same. Our wish and hope, however, is to see some totally different source of supply established, which will not drain away our river either directly or indirectly. We observe also that Sir Robert recommended the adoption of the meter system. This is the real remedy, both for water waste and for inequitable imposition of rates.

THE "Architectural Association Sketch-Book" fully keeps up its high character as a collection of architectural measured drawings and sketches. Among the drawings which illustrate rather curious and out-of-the-way subjects is the first one, of the elegant stone chimney-piece from "The Astrologer's Room," Chautmont, by Mr. H. D. Walton, a curious mingling of Late Gothic feeling with a good deal of Renaissance character of detail. Mr. Needham Wilson's pencil drawings of the chapel of the Castle Beaucare show a remarkably good bit of drawing of vaulting in the interior view; the ribs about on to a central cylindrical pier without impost, the section lines of the mouldings being defined against the surface of the pier. The title-page, by Mr. W. R. Lethaby, is a rather curious affair, inspired by the style and feeling of the engraved book illustrations of the Renaissance, and shows a courtyard with a well in the middle



in the water of which the semicircular round-arched arcade which forms the background is partially reflected; a vista is seen through the arches, and a higher circular columned building rises behind, drawn elaborately out of perspective, according to the style of the period. The drawing does not incorporate the title, which is merely printed above; and though it is cleverly done, we should more admire a true decorative design than this bit of archaeological drawing. The prize of 5*l.* 5*s.* for the best design for a title-page to vol. viii. has been awarded to Mr. W. G. B. Lewis; the prize of 3*l.* 3*s.* for the best set of two transfers from any one member is gained by Mr. Arnold Mitchell, and the prize of 2*l.* 2*s.* for the best set of three plates to Mr. T. MacLaren. Oakwell Hall is well illustrated in a set of measured drawings by Mr. F. Mitchell. Mr. MacLaren delineates admirably the fine and curious Renaissance carved detail of a pilaster in San Pietro in Casinensis, Perugia. Sutton Place, Guildford, is another old house illustrated by measured drawings by Mr. A. Gladding; and a chromo-lithograph is given of the head of a pastoral staff in the Library of Wells Cathedral, full-size, from a coloured study by Mr. R. W. Paul. Among other drawings may be mentioned Mr. Leslie C. Cornford's careful and delicate measured drawing of the screen in the Presbytery at Winchester; Mr. Horsley's rood screen at Bergamo (reproduced from the drawing now in the Royal Academy); Mr. Hardy's comparative sketches of towers at Bologna, Cremona, and Genoa; Mr. Victor T. Jones's delicate drawings of the South Porch, St. Helens, Bishopsgate; Mr. MacLaren's pencil sketches of Pompeian bronzes; Mr. Lorimer's details of the Board Room at Heriot's Hospital; Mr. Gimson's interior of St. John's, Chester; Mr. Barnsley's mosaic in the Palace Gardens, Athens; Mr. Gimson's Firegod from Haddon Hall; Mr. Edmund Sedding's measured drawings of St. Magnus, London Bridge, with a number of sections of mouldings appended; Mr. Horsley's very fine coloured drawing (chromo-lithograph) of a portion of St. Mark's Baptistery, Venice; Mr. Barnsley's measured drawings of Wells Chapter House; Mr. Begg's South Transept, Melrose Abbey (from the drawing in the Royal Academy); Mr. Lorimer's decorative details from Kellie Castle, curious and unusual examples of rather realistic Renaissance floral ornament; Mr. Gimson's interior of dining-room, South Wrayall Manor House, with its elaborate and fine plaster ceiling; and Mr. Percy K. Allen's measured drawings of the porch of Southwold Church.

House, next west of the church (end of Denmark-street); the hospital gate north of the church; the two cottages drawn in the later view by Aggas, east of the church; the way to the Elms (Endell-street); and the Merestade or Marshland, since known as Cook-and-Pye-fields—the modern Seven Dials. The nave, of two aisles with five side-windows and an east window apiece, was, together with the tower, pulled down in 1623, and replaced with one, built of brick, whereof Hutton gives a description. That church again, which Laud had consecrated, was supplanted by Flitcroft's edifice, opened on April 14, 1734. Hutton mentions the monument of one William Styddulfe, who demised a plot of land for enlarging the churchyard southwards. The whole burial-ground was surrounded by a wall, whereof a portion is replaced with a massive iron railing. The so-called "Judgment" or "Resurrection" gate, removed about 1865 to opposite Denmark-street, was originally of yellow and red brick, and stood at the end of the former avenue. Hutton says it was built in 1687 (from W. Leverton's design), at a cost of 185*l.* 14*s.* 6*d.* Various accounts are given of its curious carving, but in the rector's annual parochial report for 1865, quoted in "Old and New London," the work is stated to be "carved in oak, of the date of 1658." In this churchyard were buried "trusty" Richard Penderel, of Hobball Grange, Tong, who with his brothers aided Charles II. in his escape from Worcester fight; Chapman, the poet, and friend of Ben Jonson—his tombstone, against the church's south wall, was set up, as its inscription records, by Inigo Jones; and the headless body of the Jacobite Earl of Derwentwater, since exhumed and re-interred at Thorndon, Lord Petre's seat, near Brentwood, in Essex.

**MR. SPEAR'S** Report to the Local Government Board upon the recent prevalence of diphtheria and "croup" in the Stalybridge Urban Sanitary District, and upon the general sanitary circumstances of the district, gives the following notes on the sanitary state of the district in regard to drainage:—

"The district is sewered chiefly by pipe-sewers, but partly by brick and stone channels all emptying by many different outlets into the river as it passes through the town. Some years ago, owing, it is said, to the entire absence of ventilation of the sewers, two men working in one of them lost their lives; and since then they have been ventilated at various points by open man-holes, while the Authority have likewise favoured the plan, one that is open to grave objection,—of connecting with the sewers rain-water spouts from the roofs of houses. There are evidently many branch sewers that are still without ventilation, or that are ventilated only by the ineffective and objectionable method last referred to. Water-closets are uncommon (there are only some sixty in the town), but a large proportion of the middens and drains are drained into the public sewers; this mistaken and mischievous plan of dealing with slop-midden-privies having been adopted by the Authority some ten years ago, and for a while actively enforced.

During the last five years direct connexions between the interior of houses and the sewers have been severed in more than one thousand cases, and it was believed that the greater part of this work had been accomplished. Nevertheless, direct connexion by kitchen slop-stone or by cellar gully, sometimes even without the intervention of a trap, was found in thirteen of the houses invaded by diphtheria or "croup" during the recent prevalence, or in nearly 50 per cent. of their number; while in five others untrapped or defective drains existed in such close proximity to the doors and windows as to produce practically the same result as if the drain had been within the house. In most of the above cases, in fact, it was obvious that the houses were habitually invaded by sewer air, and in three cases in which the experiment was tried the draught coming from the drain was sufficiently strong to extinguish a lighted candle applied to the opening."

**DR. AIRY'S** Report to the Local Government Board on diphtheria and fever in the Grays Sub-district of the Orsett Registration District in 1889, gives an account of the disgraceful manner in which rustics who "made up a party to go hopping" at Cobham

were provided for, though this was probably only a normal case:—

"They crossed the Thames at Gravesend, and walked thence to Cobham on September 1. There they were housed, with other parties, fourteen families in all, in a large barn in a farmyard. They say that they had to lie on old dirty straw on which a company of harvesters had lain, some of whom stayed to the hopping, that there was no separation between families or sexes, except what they contrived for themselves by heaping up the straw between them, and that all their meals had to be taken on the straw. There was no privy accommodation; water was obtained from a well in the farmyard."

A second portion of the report deals with the state of the drainage in the Grays Thurrock Urban Sanitary District. The report says:—

"The Board were made acquainted in 1884, by the report of Mr. John Spear, with the want of sewerage in the town of Grays, then under rural administration. This want still remains unsupplied. The two old drains on the east and west sides of High-street (already mentioned) which discharge behind the sluice at the head of the dock, and a newer private drain which serves a number of houses belonging to one owner in the eastern part of the town, and which discharges into a ditch communicating by a sluice with the Thames, are the only provision for the conveyance of sewage out of the town. The general plan is to lead the house drainage to cesspools which are sunk through 10 ft. or 12 ft. of gravel down to the chalk, as described by Mr. Spear on page 3 of his report. Some of the surface drainage is disposed of in a similar way. In a new cesspool the chalk at first allows percolation of the fluid, but after two or three years the solid matter seals the pores of the chalk with an almost impervious coating. The newer cesspools are provided with inlet ventilators, but these are almost invariably plugged by the tenants.

In the northern part of the town there is great want of proper surface drainage. A large piece of waste ground is converted into a swamp by the accumulation of rain, for which no available escape is provided. A tramway embankment appears to be the main obstacle to the escape of this surface water. It is proposed to fill up the hollows in which the water lies. Care should be taken that the material employed for this purpose is not putrescible.

The want of sewerage is especially apparent in the southern part of the town, where the dwellings have been pushed forward on to the alluvial marsh land which lies below the level of high water in the river."

**ALTHOUGH** the system of cremation has certainly made progress during the last few years, burial is still likely to hold its own; and even if burial in churchyards, *i.e.*, sepulture in the neighbourhood of large towns, may at a date not so very far hence be done away with, these churchyards will only be replaced by a catacomb, or rather mausoleum system of high standard. That this latter system is already coming to the foreground will be seen by referring to the "Kijewlanin" of Russia, or to the "Journal of the Franklin Institute" of the United States, both of which happen (on very nearly the same date) to bring forward reports on such systems as have just been proposed in the respective countries. Whilst, at Kiew, the city architect has laid before the municipal authorities a design for an extensive burial place in the shape of a pyramid, divided up into galleries and cells, showing such dimensions as would give accommodation to the dead of the city for at least a century to come, but not having any special features from the hygienic point of view; Mr. John Meyers, of Washington, has laid before the Committee on Science and Arts of the Franklin Institute of Pennsylvania a design for a system of sanitary entombment for the dead of New York, in the form of a mausoleum system on a large scale, so equipped as to make the contamination of the air surrounding all but impossible. According to the report of the sub-committee, this system depends for its operation upon the enclosing of bodies in receptacles (or sarcophagi) made of concrete, and the circulating of pure dry air through such receptacles; this dry air being discharged into a closed conduit leading to a furnace, where after passing through burning fuel, it is divested of all noxious or offensive properties, and is discharged through a chimney. The design

\* Hence Bloombury: from the dyke which one William Bloomund, temp. John, made here through the Ruggens. Monmouth, latterly Dudley, street, and Crown-street, have been absorbed in Shaftesbury-avenue and Charing Cross-road.



embraces the construction of a group of large buildings, having several floors and ample corridors with tiers of "receptacles" of concrete, each provided with a proper air-inlet and outlet separate from the ventilation of the buildings themselves.

A PROPERTY, known as Markyate Cell Priory, by Market-street, Bedfordshire, is offered for sale, consisting of an estate of about 410 acres, situated near to Luton and Dunstable, and a manor house, which was mainly rebuilt some sixty years ago, but retains portions of the ancient priory. This we take to be the religious house whereof Leland writes:—

"Markyate was a nunnery of late tyme. It standeth on a hill in a faire woode hard by Vethaling-strete, on the east side of it. Humphrey Boucher, base sonne to the late Lord Berners, did much cost in translating of the priore into a maner place: but he left it nothing ended."

The priory was valued in 26th Henry VIII. at 114*l.* 16*s.* 1*d.*, according to Dugdale. Speed's valuation is 143*l.* 18*s.* 3*d.* In 1145 Dean Ralph and the chapter of St. Paul's, as lords of the soil, gave a site with lands to Christina, first prioress, when Alexander, Bishop of Lincoln, consecrated the church at Markyate nunnery to the Holy Trinity. Matthew Paris says that Geoffrey, Abbot of St. Alban's, rebuilt the nunnery, and endowed it with the tithes of Cashio. Dugdale gives a list of the eleven prioresses, Joane Zouche being the last. In 38th Henry VIII. it was granted to George Ferrers, from whose descendant it passed, 1640, to the Coppin family, and thence to the Howells.

NORBURY PARK, near Dorking, a fine property covering about 860 acres in a favourite part of the county, was put up for sale at the Mart on Tuesday last, by order of trustees under the will of the late Mr. Thomas Grissell.\* It is bounded upon three sides by the Mole; Mickleham Church, and what are locally known as the river "Swallows," lying to the south. The park is well timbered. In a wood upon the estate stands the Druids' Grove, composed of yew trees, many of which have attained to a great age. Norbury Park was held, 8 Edward II., by William Husee of Gilbert Earl of Clare at service of half a knight's fee; his daughter and heir, Isabel, brought it in marriage to William Wymeldon. From the Wymeldons it passed, 14 Henry VII., to Thomas Stodewolfe. Having devolved, in 1691, upon the Tryons, it was sold for 35,000*l.* to one Anthony Chapman, in 1766, who cut down many of the famous walnut trees. Eight years later it was bought by William Lock, who pulled down the old house in the meadows by the river, and built for himself the new house on the higher ground, whence the prospect extends to distances remote both north and south. Some of the sitting-room walls were painted by Cipriani and George Barret, the ceiling and the sky effects being by Pastorini. The property includes two farms and three separate residences, known as Foxbury, the Priory, and Cowslip Castle.

WE are glad to see that the question has at all events been asked, whether the Constitution-hill arch is ever to be surmounted by a quadriga group, or something of the same nature, in accordance with the intention of its ill-used architect, Decimus Burton. The reply of the First Commissioner of Works was that it would cost a great deal, and that he was not prepared to make that demand upon the Treasury. This, however, is the stereotyped reply in the House of Commons to all appeals in favour of a work of art, in the first instance at all events. A little persistence in asking the question will perhaps elicit something more, by degrees.

\* We are informed that, having been withdrawn at the sale, it was afterwards purchased by private contract.



TRULY we live in an age of competition. Even "professional services" are put up to tender. A reliable correspondent sends us the following list of tenders:—

"WEST HAM.—For designing, planning, and superintending the erection of Poor-law schools, for the West Ham Union, Essex, including all attendances, travelling expenses, and all charges:—

A. & C. Harston .....	5 per cent.
J. T. Newman .....	5 " "
J. M. Knight (accepted) .....	2½ " "

This, as our correspondent says, is "cutting it fine." The successful competitor, we understand, is Surveyor to the Mile End Vestry.

#### OLD COTTAGES, GLOUCESTERSHIRE.—V.

THE farmhouse at Humphries End lies close to More Hall, illustrated on July 19. It is an instance of the latest revival of mullion windows, since it is dated on the north side 1696. The style has become more formal, however, than the earlier work, and the usual return gables are not present. The dormers lit small spaces in the roof that, as I mentioned in writing of Surrey, were doubtless thought sufficiently good sleeping-benches at the time they were built, but are now closed up. It is probable, however, that the shutters that fill many of the windows are original, and that the windows were never glazed. The ground floor is kept well up and good cellar windows provided. The chimney "sets off" are of a usual form. The old houses in Church-street, Stroud, were built in 1642, as is narrated in the delightful "Notes and Recollections of Stroud," written by Mr. P. H. Fisher. They were very infirm, and I was told last November were shortly to be taken down to allow of the street being widened, so probably they do not now exist. The house shown in the distance, I learn from the same authority, was built in 1633 by Thomas Webb, a member of one of the principal weaving families. Other houses of this family are Egypt Millhouse that I have already illustrated, Gydynap, and the Hillhouse, Wickridge, close to Stroud, built by this same Thomas Webb in 1634.

The sketch at Stonehouse is at the back of a house that, as shown by a mutilated projecting window, once possessed importance. The arrangement of chimney and gable is picturesque and instructive.

At Stonehouse is a fine Elizabethan house, of too important a character for my work. It has

ROYAL ASSOCIATION FOR THE PROMOTION OF THE FINE ARTS IN SCOTLAND.—On the 30th ult. the annual meeting of this Association was held in the Society of Arts' Hall, 117, George street, Edinburgh. Sir Thomas Clark, Bart., presided. In the unavoidable absence through illness of Mr. H. W. Cornillon, the Secretary of the Association, Mr. Ramsay, the clerk, read the fifty-sixth yearly report by the committee of management. The subscriptions for the present year amounted to 5,529*l.* Out of the sum placed at the disposal of the Committee during the year they had purchased from the recent Exhibition of the Royal Scottish Academy, and from the Exhibition in Glasgow of the Royal Scottish Society of Painters in Water-Colours, at a cost of 495*l.* 12*s.*, works of art consisting of twenty paintings and nine water-colour drawings. The presentation work for this year consisted of a volume of reproductions of several of the best works of Sir Henry Raeburn, containing also a biographical sketch of the artist, and descriptive notices of the persons represented. The report was adopted.





At Stonehouse.



Owlpen Manor-house, Gloucestershire.

the central porch and other features of the period, and inside a mantelpiece carved with the royal arms. This has been illustrated by the Gloucestershire Archaeological Society, and it is thought to commemorate Queen Elizabeth's visit here.

In the churchyard at Stonehouse are a number of "coffer" tombstones, most elaborately carved, and well worthy notice. One, at least, has very beautiful carving of a florid character, and must have been done by a first-class artist.

R. N.

#### SCOTTISH OPINION ON THE TRAINING AND REGISTRATION OF PLUMBERS.

A CONGRESS of the Scottish District Councils, acting in conjunction with the Worshipful Company of Plumbers, was held on the 31st ult. and 1st inst. at Edinburgh, under the presidency of Dr. Alexander Crum-Brown, Professor of Chemistry, Edinburgh. There was a good attendance of representatives from the several District Councils in Scotland, and the Clerk of the Plumbers' Company was also present.

The subjects discussed included the question whether any steps should be taken to enlarge or enforce the by-laws of municipal authorities with reference to plumbers' work in new dwellings and other buildings, and it was mentioned that in Aberdeen, where a set of by-laws had been framed by the co-operation of plumbers, architects, and other members of council, the result had been most beneficial to the community. Some reference was made to

the question of registered against unregistered work, but the general feeling appeared to be that the power of the registered plumbers would certainly increase as their number increased.

The next question considered was the desirability of obtaining Parliamentary powers. It was very strongly urged that plumbers of all grades should be made to recognise the vital influence of their work upon the health of the community. It was necessary that there should be an Act of Parliament to ensure that none but thoroughly skilled and competent men should undertake plumbers' work. "Can certificates be cancelled or suspended under the present voluntary system?" was the next question dealt with, and, after full discussion, it was answered in the affirmative. A resolution was passed to the effect that the best way to get plumbers to take practical interest in the movement was to promote technical education among members of the trade by the maintenance and extension of the plumbers' classes, and by affording inducements to plumbers to attend—at the same time impressing upon public authorities, architects, master plumbers, and the public generally the advantages of employing none but registered plumbers.

The Clerk of the Plumbers' Company described a graded syllabus of instruction in the principles and practice of plumbing which the Company were preparing, together with model indentures, with the object of identifying the systematic training of apprentices with the conditions of their apprenticeship. A resolution was passed expressive of the opinion of the Congress that a graded scheme of education for plumbers, including workshop practice, was feasible and desirable; that the scheme of the Worshipful Company of Plumbers should be considered by the District Councils; that all apprentices should be indentured, and that master plumbers should interest themselves in the education of their apprentices.

It was further resolved that it would be desirable that a general as well as a district list of all registered plumbers should be issued, that the laws of all district councils should be framed after one model, and that pocket certificates should be issued to registered men.

A long discussion took place as to whether it was desirable to have a Central Board in Scotland for the management of the business of the Scottish Councils, but the general feeling was against the suggestion, and it was decided instead to have a similar Congress annually, Glasgow being fixed upon as the next meeting-place.

The Chairman, in closing the proceedings, said the Congress had more than answered his expectations, and that was saying a good deal. It was a great pleasure to him to listen to the frank and full discussions which had taken place, and he was especially pleased to note the remarkable unanimity in the opinions elicited from the representatives of the several Scottish Councils.

#### ARCHÆOLOGICAL SOCIETIES.

##### CAMBRIAN ARCHÆOLOGICAL ASSOCIATION.

—The forty-fifth annual meeting of this Association will commence at Holywell, Flintshire, on Monday, August 18, and will be continued on the four following days.

DERBYSHIRE ARCHÆOLOGICAL SOCIETY.—On the 26th ult. the members of the Derbyshire Archæological and Natural History Society made an expedition into East Derbyshire. They arrived at Dronfield about noon, and inspected the church under the guidance of Mr. J. B. Mitchell-Withers, F.R.I.B.A., who had prepared a paper upon it, and which he read to the visitors assembled in the chancel. First dealing with some of the changes which had been impressed upon the fabric, he observed that it was not certainly known by whom it was erected, but in all probability it was by one of the family of Brailsford soon after the Norman conquest. Early in the reign of Elizabeth, commissioners were appointed to survey the chancel and the parsonage house, and to certify to the decays thereof; how long they had been in decay; by what occasion, and who had made any waste, and by whose default the same remained un-repaired. They were also to estimate the cost of the repairs, and what the parishioners would contribute towards it. The commissioners reported that the east window of the chancel had fallen down, and was in great ruin and decay; that other windows were in decay for

THE ROYAL ITALIAN OPERA HOUSE, COVENT GARDEN.—In the course of this autumn will be offered for sale, at the Auction Mart (unless previously purchased) the ground-lease, for fifty-seven years unexpired, of the Royal Italian Opera House. The sale will extend to the library of music, the wardrobes, costumes, and furniture, together with a varied collection of theatrical "properties."



want of glass and iron, and that the roof and other parts of the fabric were out of repair; but no lead or timber or other matters had been taken away. The parishioners undertook to provide all stone, lead, and other things for the repair of the church. In 1818 the church was struck by lightning, and the spire and other parts of the building were much damaged, and it had to undergo extensive repairs. Coming to the architecture of the church, as it exists at the present time, Mr. Mitchell-Witbers said the remains of the Norman period were small, and consisted of the piers of the tower arch, the base of a buttress at the west end of the north aisle, and the bases and capital of the nave piers. The latter had been recut and altered at different times, but still retained some of the elements of their original sections. The south aisle is of the Early Decorated period simply treated, its windows being of the class called intersecting tracery. The north aisle had been of a similar class of work, but evidently rebuilt, probably after the damage by lightning in 1818. The result was unsatisfactory and weak. The chancel is of a later period, probably about 1300, and is a fine example of Geometric work, with touches of transition to the next or Curvilinear style, seen in the ogee form of the canopies of the sedilia. The east window is denuded of its tracery, but retains its original jambs and arch. The tracery of the other windows is of excellent design. The ancient stained-glass in the windows is of a fragmentary character; but the whole is beautiful in colour, and contains exquisite bits of design, and he trusted it would never be replaced by modern work. The remains of the stalls are simple and massive, and are ornamented with a four-leaved flower and poppy heads, and they were not much later, he believed, than the chancel itself. The vestry and room over are of the same date. The square-headed window in the south aisle is of the Curvilinear or Late Decorated period, and must, he thought, have been inserted to give more light to the altar of the Blessed Virgin, which was situated below it. The remains of the piscina still exist behind the boarding, and Perpendicular work occurs in the tower and spire. In the chancel are two interesting brasses, one to the memory of the Fanshawe family, dating from 1573; the other representing two ecclesiastics, former rectors of the church, one Thomas Gouffrey, who died 1399, and the other Roger Brailsford, who died 1396. A bugle horn is suspended between the two, having reference to the Foresters of Wormhill, to which family Gouffrey belonged. The upper portion of the pulpit is English Renaissance, and is a very fine specimen. It is similar to those in Chesterfield, Rotherham, and other neighbouring churches. After luncheon, the visitors proceeded to Beauchief, in order to inspect the Abbey. The party having taken seats within the Abbey Church, Mr. J. D. Leader, F.S.A., read a short paper on the history of the Abbey, and explained the position of the monastic buildings. The Abbey was founded by Robert Fitz Ranulph, between 1172 and 1176, and dedicated to St. Thomas the Martyr. It was given to the white canons of the Order of Premonstré, and was made a daughter of Welbeck. The only remains now standing are the west tower and a portion of the nave of the church; but on the south side of the church it is easy to recognise the site of the monastic buildings. Mr. Leader pointed out the position of the chapter house, the refectory, the guest chamber, and the abbot's lodgings, all standing around the cloister garth. Beyond these, round an outer court, were the domestic offices, brewery, bakehouse, barns, stables, &c., occupying the site of the present farm buildings. The church has been long without aisles, but with north and south transepts, and an aisleless choir and presbytery. At the intersection of the nave and transepts stood a tower, the ruins of which now form a grass-covered mound. Large portions of the ruins have been taken away for the erection of modern buildings; but in a meadow lying south-east from the church there are indications of buried foundations, which Mr. Leader suggested might be the site of the infirmary. Subsequently the visitors proceeded to Norton, and at Norton Church Mr. Francis Westby Bagshawe, J.P., described the principal features. He said that the church probably was built by the founder of Beauchief Abbey, on which it was dependent, as were also Dronfield Church

and churches at Edwalton, in Nottinghamshire, and Wymeswold, in Leicestershire. The chancel was, he thought, erected about the year 1490, and the Blythe Chapel was also of the same period. This latter was built by one Blythe, who was Bishop of Lichfield and Coventry, and the chapel was put up by him in memory of his father and mother, as also was the monument of his parents, in full effigy, still in the church. This monument is in alabaster, and is exquisitely carved, and at one time had been beautifully painted. On the roof of the bosses, on which were carved roses, the monogram, D. and I.H.S., were in a good state of preservation. A door, just below the chapel step, was closed up during the late restoration. After leaving the church Mr. Bagshawe entertained the party at tea at The Oaks, where he had placed for inspection in one of the ante-rooms an interesting series of early charters and deeds. The excursionists, after leaving The Oaks, drove to Sheffield station, whence they returned to Derby after a pleasant expedition.

NEWCASTLE SOCIETY OF ANTIQUARIES.—At the monthly meeting of this Society, held on the 30th ult., Dr. J. Collingwood Bruce, F.S.A., read a long and interesting paper on the life and antiquarian labours of Mr. John Clayton, whose death was recently recorded in our columns. Subsequently, Dr. Hodgkin read some "Notes on the discovery of twelve bronze vessels on the site of Prestwick Carr," and Mr. Boyle read a paper "On the materials, printed and unprinted, for the history of Northumberland."

WILTSHIRE ARCHEOLOGICAL SOCIETY.—The annual meeting and excursions in connexion with this Society were held at Devizes on Wednesday, Thursday, and Friday last week. The business meeting was held on the first day at the Town-hall. On the motion of Mr. Story-Maskelyne, M.P., General Pitt-Rivers was elected President of the Society for the ensuing year. The Rev. F. H. Goddard, one of the general hon. secretaries, read the report of the Committee. This showed that the total number of members on the books was 373, or a decrease of four. Reference was made to the loss by death of the Right Hon. E. P. Bouverie, the Rev. Prebendary Scarth, Sir Daniel Gooch, and the Rev. H. Brown-Cave. Profound regret was expressed at the resignation of the Rev. A. C. Smith as hon. secretary and editor of the magazine, and a warm tribute was paid to his valuable services. The report also referred to the work done by General Pitt-Rivers in excavating Wans Dyke and Bokerley Dyke. The report was adopted and ordered to be printed. The President, General Pitt-Rivers, then delivered his inaugural address, which was descriptive of the excavations that he had made during the past ten years in the two Romano-British villages of Woodarts and Rotherley. The address was illustrated by diagrams and models. At the close of the paper the Rev. C. U. Plenderleath took the opportunity of referring to a curious mistake which had been made during the meeting of the British Archaeological Association at Devizes ten years ago, and which had been allowed to pass uncorrected ever since. It was stated at that meeting that Devizes Castle was built by "Roger Poore, Bishop of Salisbury." Now it was a fact that no such person as Roger Poore was ever Bishop of Salisbury, but it was evidently a mistake for Roger the Norman. He thought it was advisable, in the interests of correct history, that the mistake should be mentioned and put right. The members then adjourned to the churches, which were explained by the Rev. Dr. Burges, and by the kindness of Sir Charles Rich the grounds of Devizes Castle were visited, and the principal points of interest were shown and explained. On the following days there were excursions to various places of interest in the locality, including Fotherne, where the Ven. Archdeacon Buchanan described the old church, pointing out that it was built in the early part of the thirteenth-century. The party then proceeded to the Old Porch House, the property of Mr. W. B. Richmond, R.A., of which Mr. Walter Buchanan gave an interesting account. Various ideas were hazarded as to the date of the building, but it was generally agreed that it was Elizabethan. The floors were originally of mud and rushes, but now Mr. Richmond has had them laid with tessellated pavements. After inspecting the museum of curiosities, the party proceeded to Market Lavington, where Mr. C. E. Ponting, Diocesan Surveyor, read an interesting and comprehensive paper, saying that formerly a

Norman church stood there, and was rebuilt in the fourteenth century. A very interesting feature of the church was that the floor originally sloped with the natural level of the earth. This was levelled in the fifteenth century. The staircase to the tower is only 16 in. wide, and is in perfect preservation. The tower is fifteenth century. The roof of the chancel is the original fourteenth-century roof.

## Illustrations.

### ILLUSTRATIONS OF OXFORD.

THE illustrations in this and the next number have all been selected in reference to the annual excursion of the Architectural Association, which takes place this year to Oxford and its neighbourhood. The illustrations in the present number are all taken from Oxford itself.

Mr. Fulleylove's sketch gives the first near view of Oxford as seen on entering it by Magdalen Bridge, with Magdalen tower and buildings on the right. Views of two of the most remarkable ecclesiastical structures in the city follow: St. Mary's spire and the interior of Christ Church Cathedral. Three views of Mr. T. G. Jackson's buildings are illustrated: part of the interior of the Examination Schools, the exterior of the same building towards the quadrangle, and the new buildings of Corpus Christi. Mr. Champneys's Indian Institute, and Messrs. Bodley & Garner's new buildings at Magdalen, form the subjects of two other plates, and another one gives various sketches made for this occasion from Merton College and Christ Church Cathedral.

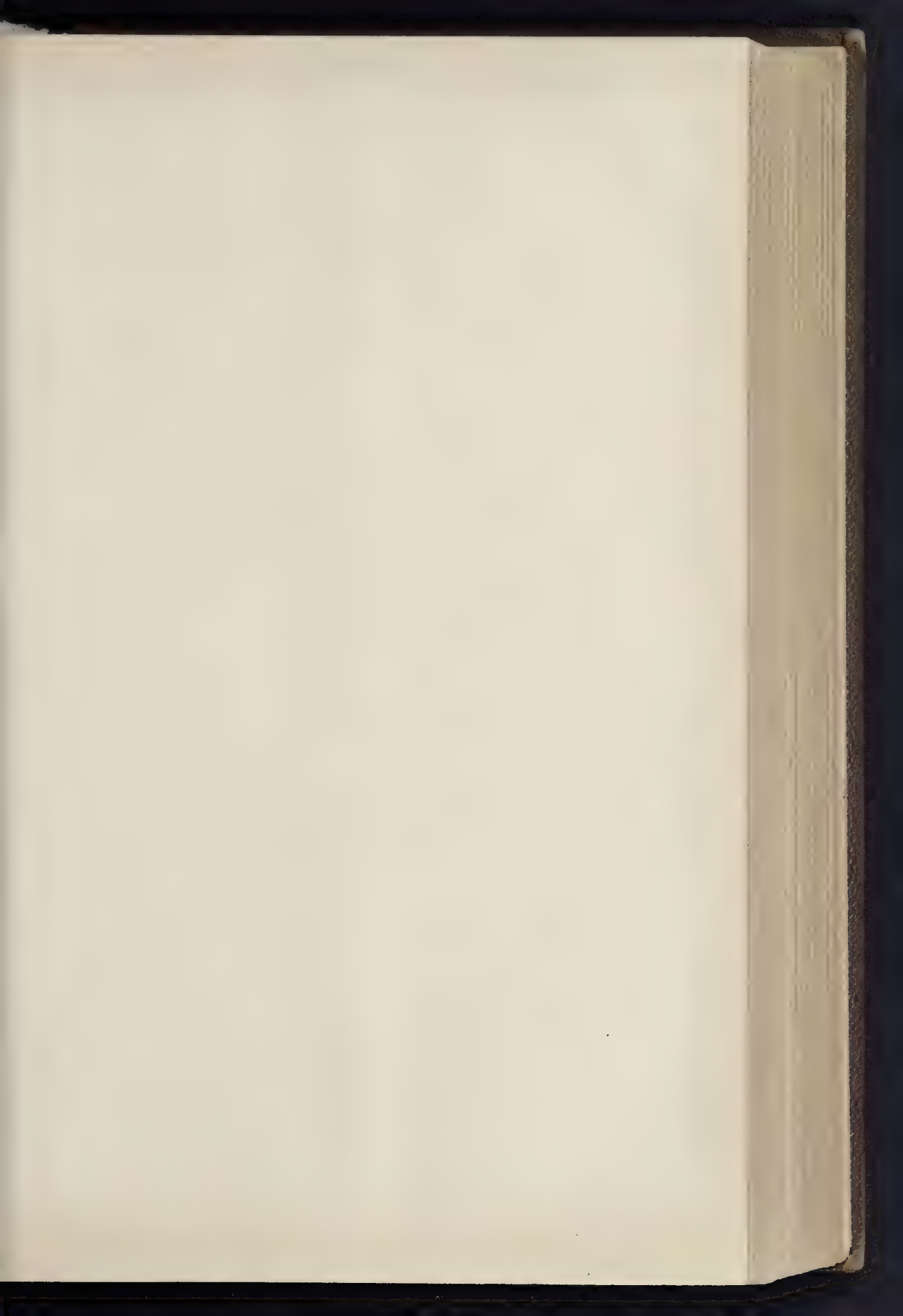
All the illustrations are further commented on in an article on another page, but in regard to one or two of the new buildings we have received some special information from their architects.

Begun in 1876, the main building of the Examination Schools was finished in October, 1882, and inaugurated by a concert, at which H.R.H. the Prince of Wales was present. The building was completed in 1888 by the addition of the building at the corner of Merton and of High-street, containing a library for the unattached students, and various delegates' offices. The materials used are Clapham stone for exterior dressings, Caen stone within. The body of the walls is of stone from Headington, and where not faced with ashlar, facings of Gibraltan stone, hammer-wressed, are used. The marble work in staircase and angle halls is chiefly Italian, and in some cases consists of antique fragments from the ruins of the baths of Caracalla at Rome. The cost of the whole block, including the schools proper, and the non-collegiate building, including lighting, heating, and ventilating, and all structural decoration, such as the moulded plaster ceilings, marble work, chimney-pieces, chandeliers, &c., door-cases, and carving, of which every detail was studied and designed by the architect, was about 106,000*l.*, which is rather less than 1*s.* 2*d.* per cubic foot on the entire work.

The Indian Institute is built in Teynton stone. Messrs. Symm, of Oxford, were the contractors. The present building includes rather more than half of the entire scheme, the museum and library being at present little more than one-third of the length of those designed. It is intended ultimately to extend it some 40 ft. along the "Broad," and the additional site has been secured. The present portion was erected in 1883-4.

THE ANCIENT ARCHBISHOP'S THRONE, CANTERBURY.—As reported in the *Times*, Mr. Cavendish-Bentinck last week asked the Vice-President of the Committee of Council on Education whether he was aware that the Archbishop's throne which was presented to Canterbury Cathedral by Archbishop Tenison, and which was designed and executed by Grinling Gibbons, had for many years past been stowed away as lumber in a damp cellar adjacent to the Cathedral cloisters, and whether he would, on behalf of the Department of Science and Art, apply to the Dean and Chapter for the loan of this beautiful and interesting work in order that it might be rescued from its present unsatisfactory position, and preserved in the Kensington Museum. Sir W. Hart Dyke said that he was much obliged to Mr. Cavendish-Bentinck for calling attention to the matter, and would be glad to act upon his suggestion as soon as possible. How does it come about that such an artistic relic has been for so many years treated as lumber? Some one of those concerned ought surely to have known better.





THE BUILDER, AUGUST 9, 1890.



OXFORD: NEW BUILDINGS, MAGDALEN COLLEGE.—MESSRS. BODLEY & GARNER, ARCHITECTS.

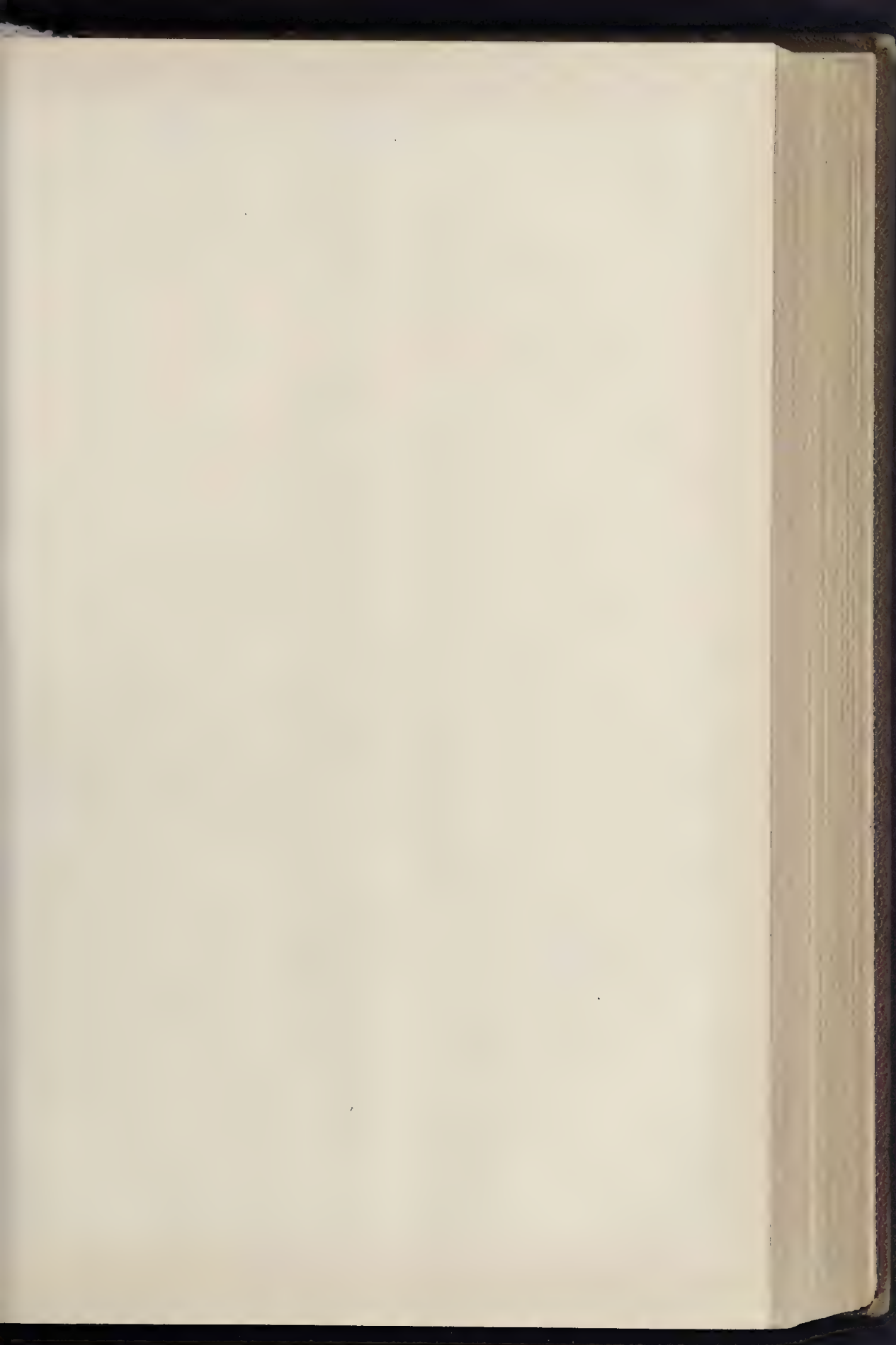


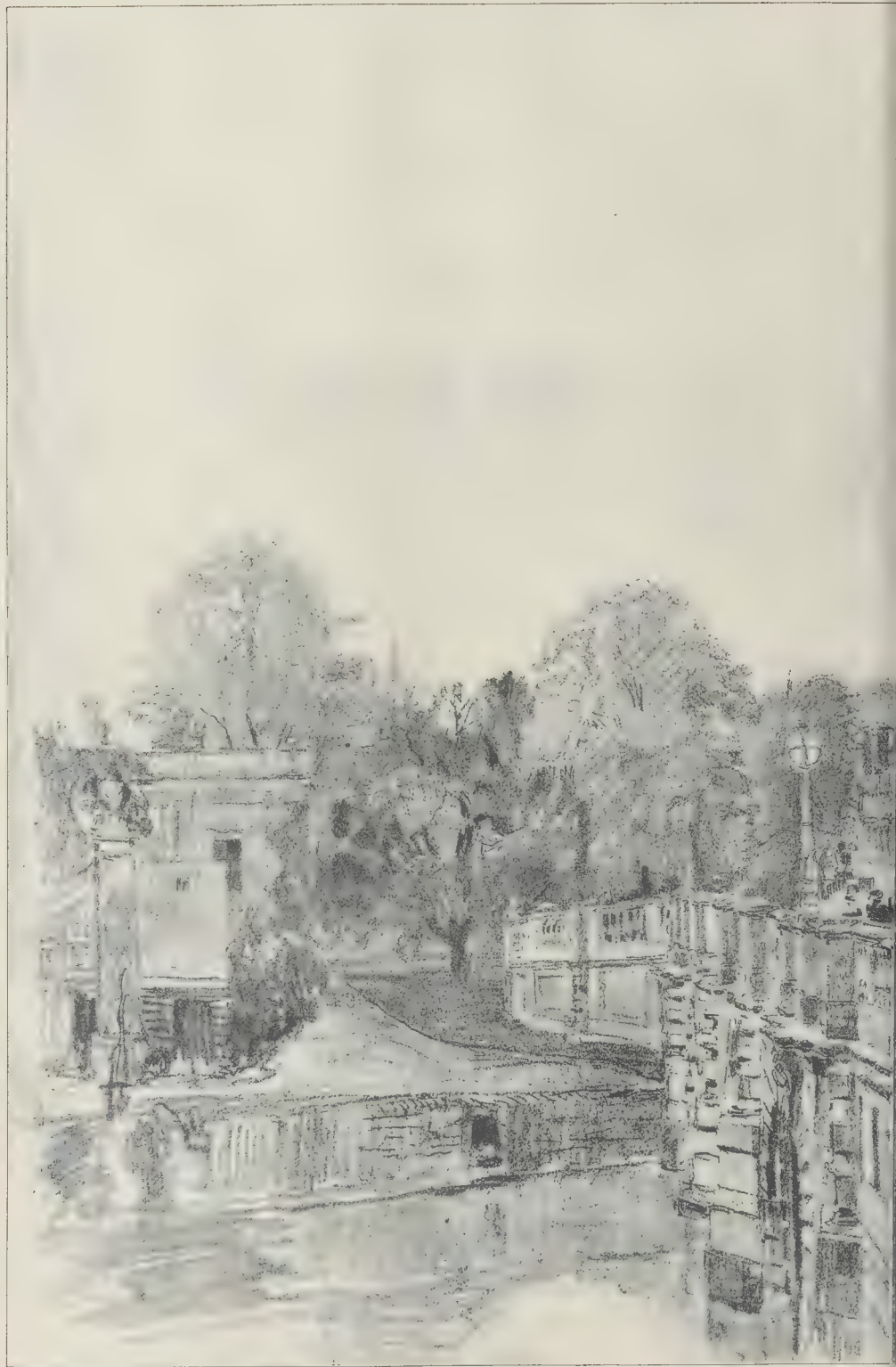




OXFORD. NEW BUILDINGS, CORPUS CHRISTI COLLEGE.—MR. T. G. JACKSON, ARCHITECT.







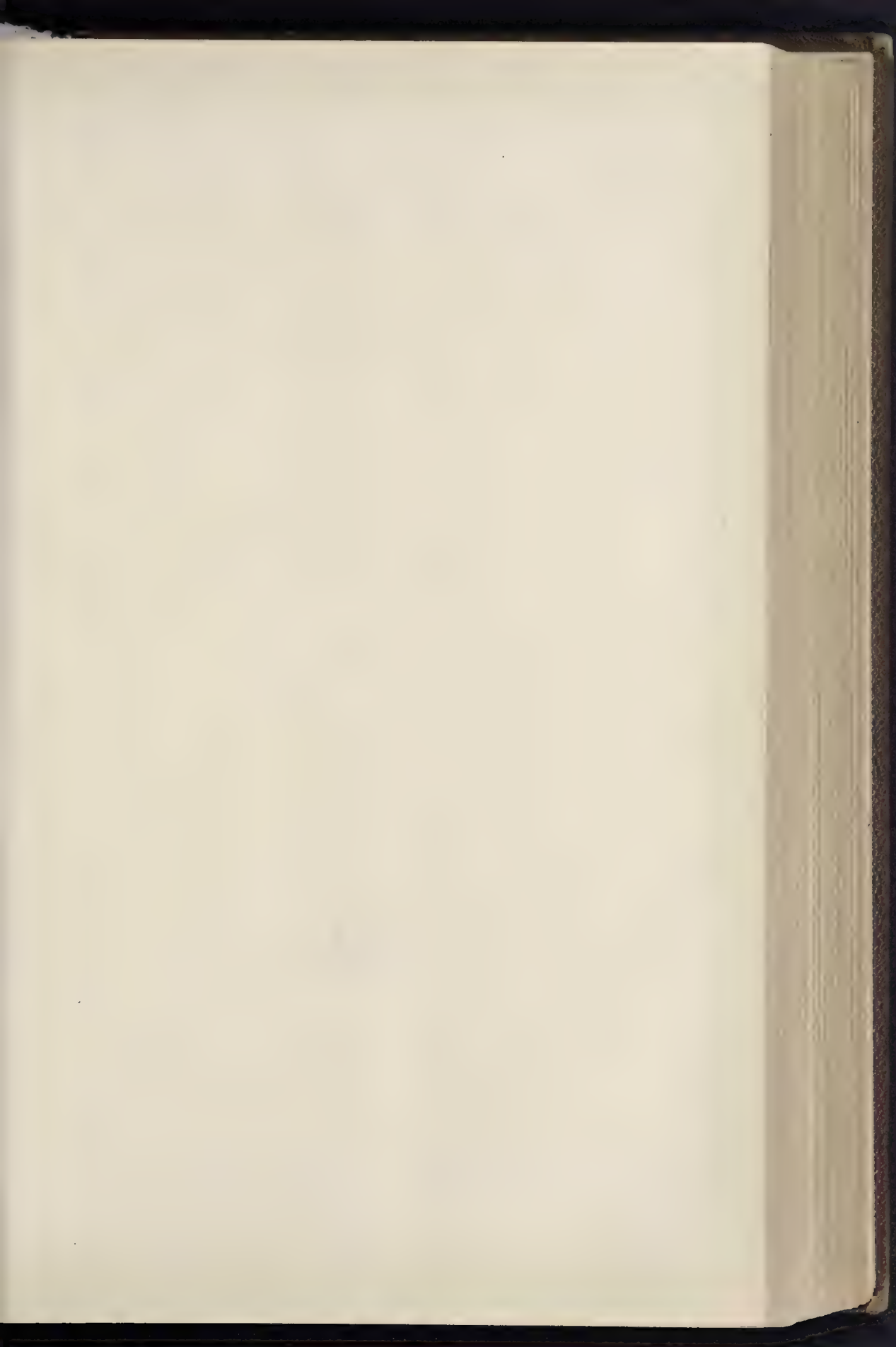
OXFORD: MAGDALEN TOWER FROM

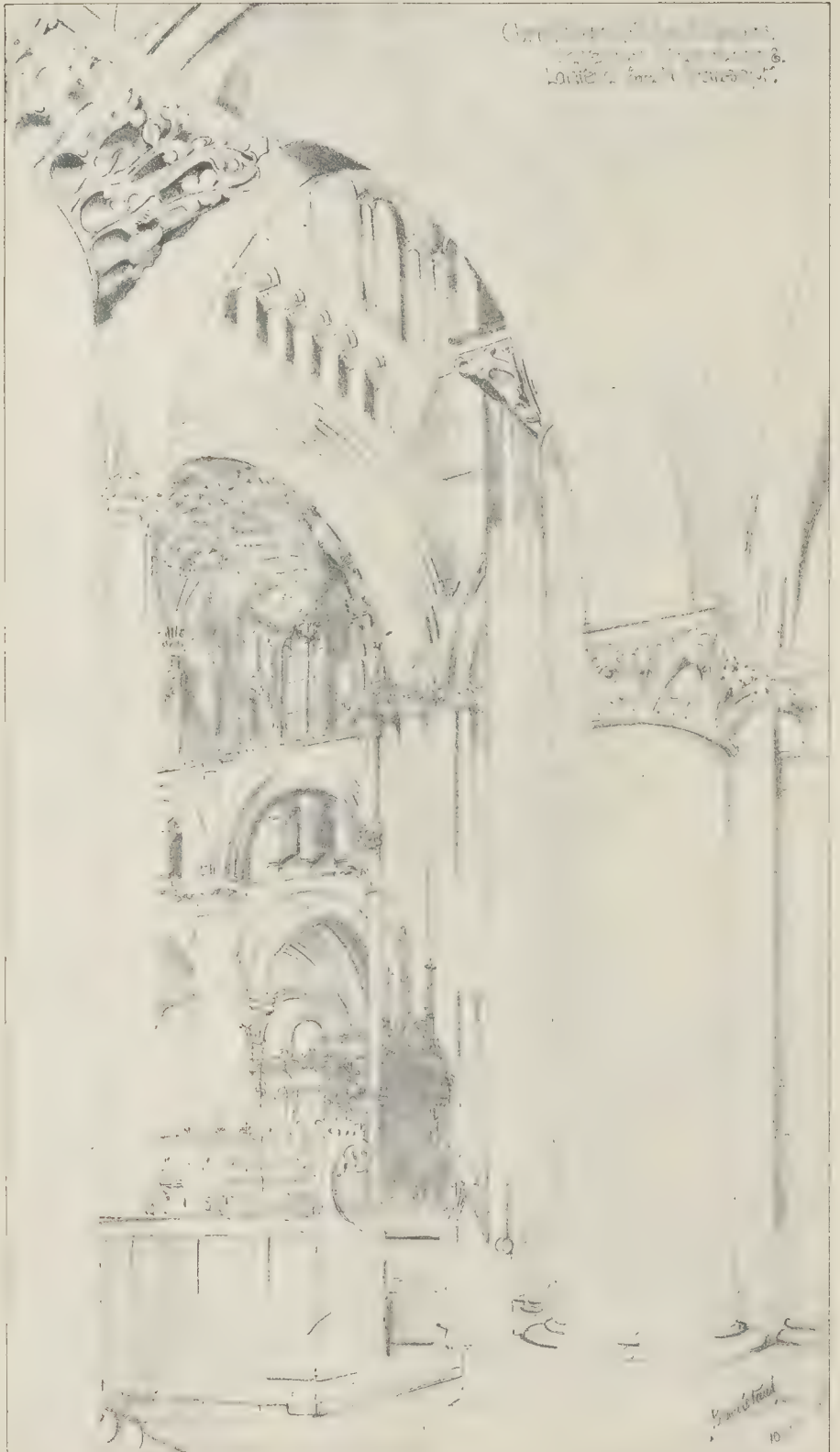














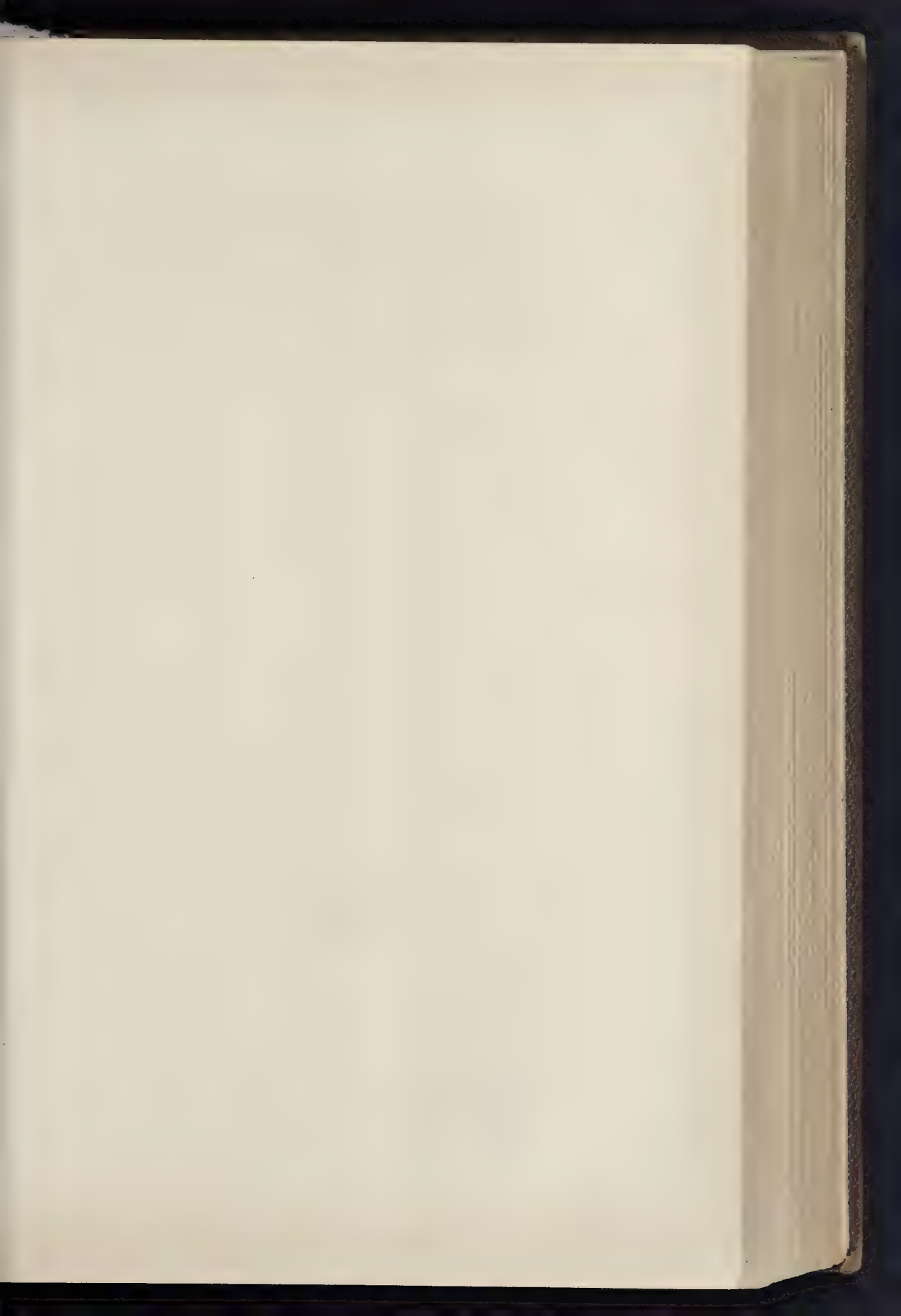


Oxford

Church of the Virgin  
N. View









OXFORD: NEW EXAMINATION  
UPPER HALL



1890.



—MR. T. G. JACKSON, ARCHITECT  
—MR. J. H. CASE.







OXFORD: NEW EXAMINATION SCHOOLS.—MR. T. G. JACKSON, ARCHITECT.  
CENTRE FEATURE FACING QUADRANGLE.





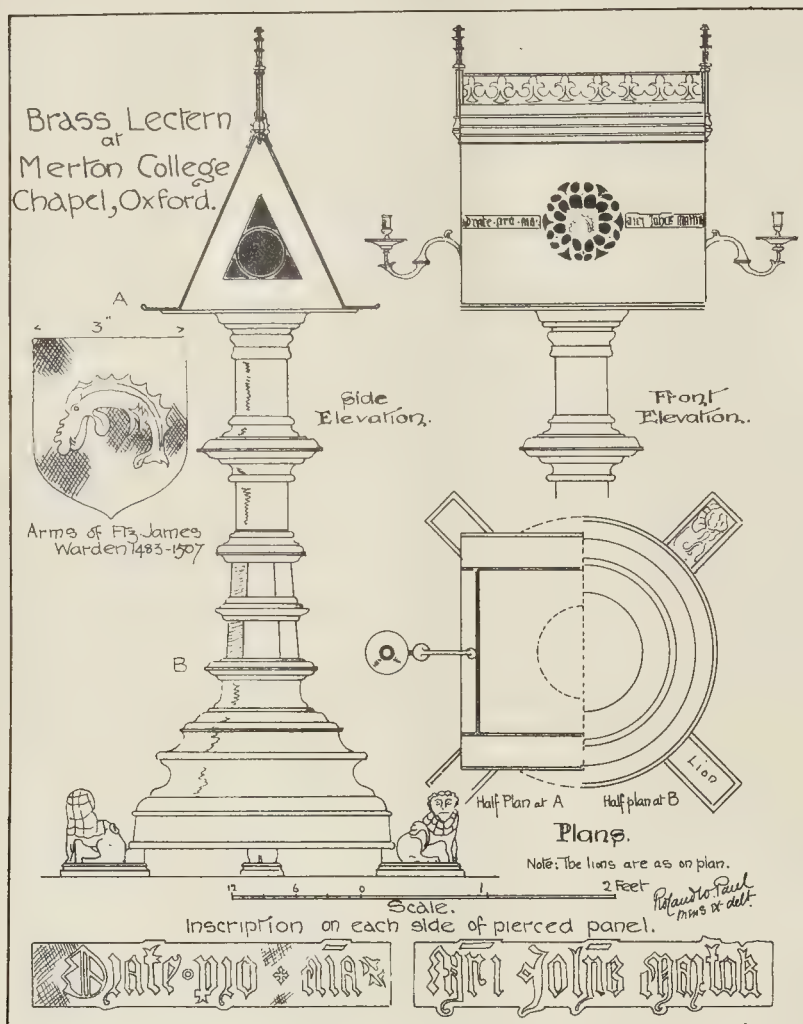


OXFORD THE NEW INDIAN INSTITUTE. - MR. BASIL CHAMPNEYS, ARCHITECT.

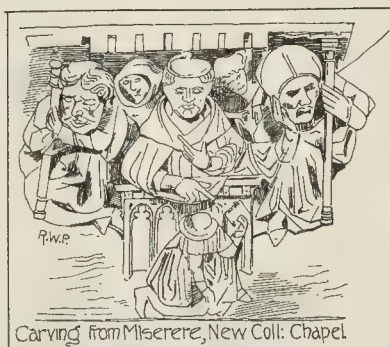








The  
Architectural  
Association  
Excursion  
to Oxford.  
and Neighbourhood



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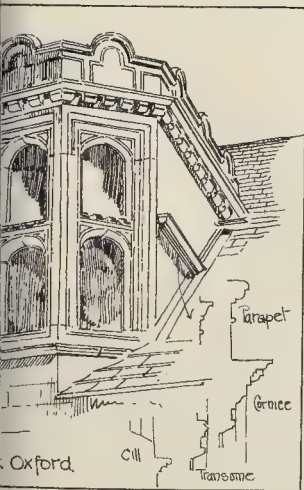
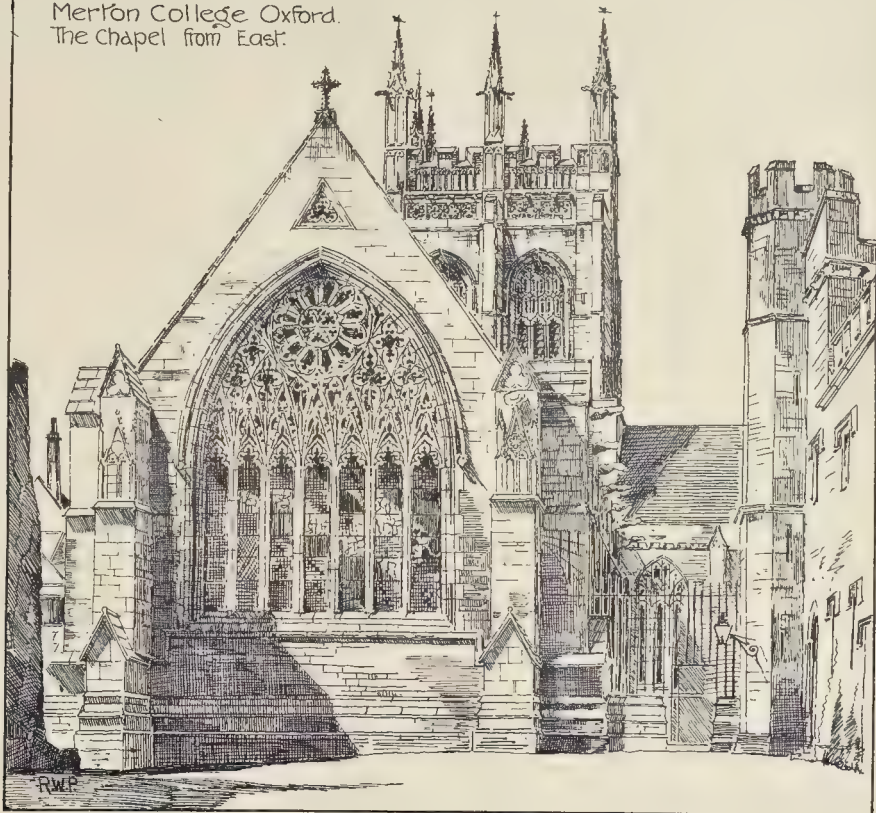




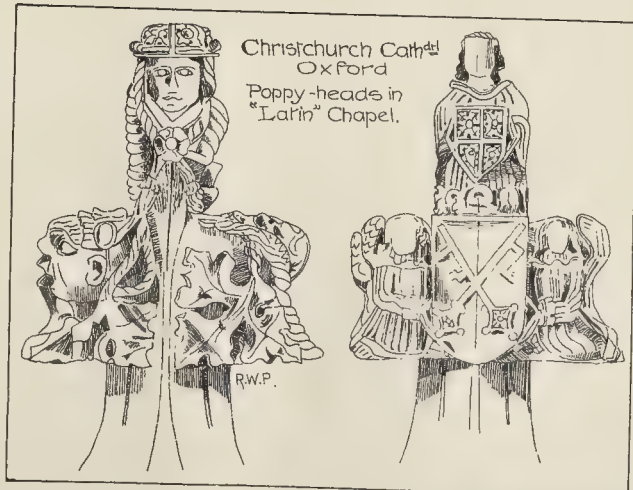
Mass  
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Marlock  
well Ch:  
omerset.

Marlock  
in the year  
have mercy

Merton College Oxford.  
The chapel from East.



Christchurch Cath<sup>l</sup>  
Oxford  
Poppy-heads in  
"Latin" Chapel.







## BOYLE'S PATENT VENTILATORS.

MR. ROBERT BOYLE, of the firm of Robert Boyle & Son (Limited), has, with characteristic enterprise, just made his third circuit of the globe, with a view, we are informed, of "awakening an increased interest in sanitary science and securing the adoption of improved sanitary measures and appliances,"—especially, we make no doubt, Boyle's ventilators. "The first country visited" (we quote from an account which has been sent to us) "was Egypt, where Mr. Boyle surveyed the Palace of the Khedive at Cairo, furnishing plans and estimates for the ventilation of it. At Bombay, India, he made an examination of the drainage of that city, and submitted plans for its ventilation. The Boyle system has also been adopted at the military barracks and officers' quarters, Bombay. In China, he surveyed the French Cathedral at Canton, supplying plans for the ventilation, also the Summer Palace of the Emperor at Peking." A scheme for the improvement of the sanitary condition of the capital has likewise been submitted to the Chinese Government through Li Hung Chang, the famous Viceroy and virtual ruler of China, whom Mr. Boyle had the honour of meeting at Tientsin. When in Shanghai Mr. Boyle tested his system of ventilation as applied to the Shanghai Club, said to be the finest club in the East, and the following report from the architect, Mr. J. Cory, F.R.I.B.A., testifies to its success:—"The application of your system of ventilation to the Shanghai Club has proved so successful and given such satisfaction that I purpose using it exclusively in my practice here. Your latest improved air-pump ventilator has successfully withstood the trying conditions of this climate, where open pipes and other such arrangements have proved useless." The Chinese Merchant Steamship Company, Shanghai, have adopted the Boyle system of ventilation for their vessels, several of them being already fitted with air-pump ventilators. In Japan Mr. Boyle surveyed the new Imperial Houses of Parliament, also the Imperial University of Japan, for the ventilation of which buildings plans have been sent in. Mr. Boyle returned to England via the United States and Canada, important contracts being pending in San Francisco, and a scheme of ventilation having been sent in for the Canadian Houses of Parliament, Ottawa." We are informed that it is Mr. Boyle's intention to publish shortly in book form his experiences in the East.

Last year we mentioned Mr. Boyle's visit to Salt Lake City, Utah. In the course of his three journeys round the world he seems to have surveyed mankind "from China to Peru," and if he continues at this rate he will soon be signing, like Alexander, for other worlds to conquer.

THE ENGLISH IRON TRADE.—The English iron market is firm, and the trade doing, though moderate on the whole, shows more life. Pig-iron is in a rising tendency, although so far the advance has not been much, showing itself chiefly in the greater stiffness of makers. Middlesbrough No. 3 is quoted at 53s. 6d. per ton dearer. The Glasgow warrant market has also been stronger, and there is more inclination to buy. Scotch makers' iron is likewise in more request, at firm prices. Although business is rather slow in Lancashire, a steady tone is maintained. In the Midlands there is a fair current of activity. A slight rise has taken place in the North-west for hematite pig, makers now selling at 53s. 9d., the figure quoted for warrants. The demand for manufactured iron is somewhat brisker, at unchanged rates. Steel continues rather quiet, but steady, and even stiffer. Shipbuilders continue to receive fresh orders, and engineers remain active.—*Iron.*

PROPERTIES FOR SALE.—(1) Duirinish, comprising the lands of Skindin, Colonsay, and Glendale, at the head of Loch Pollart, in the west of the Isle of Skye, a sporting estate of 25,000 acres, and divided into several holdings, all yielding a net rental of about 1,000l. a year. (2) By auction, at York, on September 13, Bossall Hall, in the North Riding, lying on the western side of Derwent-valley. This estate, being nearly 500 acres, possesses many historical associations, and has been held during five centuries past by the ancestors of its present owner.

SCOTCH ESTATE FOR SALE.—The Invermay Estate, situated in the valley of the Earn, on the south-eastern confines of Perthshire, will be exposed for sale at Edinburgh on September 10 next, at an upset price of 95,000l. It extends over nearly 3,900 acres, whereof 2,620 are under cultivation, with 690 acres of woodland. The house stands on the western slope of the Ochil Hills, overlooking the vale, and in the policies are the Invermay birks, watered by the river May, a tributary of the Earn. The free rental, exclusive of the mansion and shootings, is stated to be 2,642l. a year.

## Books.

*Kelly's Directory of the Building Trades.* London: Kelly & Co., 51, Great Queen-street.

THE sixth edition of this excellent Directory has just appeared. It purports to comprise "every trade and profession in any way connected with architecture and building throughout England, Scotland, and Wales, and the principal towns in Ireland." The volume extends to nearly 2,000 pages, and is well printed and arranged. So far as we have tested it we have found it to be reliable and up to date in most respects. We may point to one omission in the list of Metropolitan Vestries and their officials. The office of Surveyor to the Vestry of St. Martin-in-the-Fields is indicated in the Directory as vacant; but the appointment of Mr. Charles Mason to that office was mentioned in the *Builder* of March 1 as having taken place in the previous week. The preface contains some interesting statistics as to the number of persons to whom the building trades give employment. The number for London alone is stated at 125,619, a total which is thus made up:—Architects, 2,067; surveyors, 1,173; builders, 7,333; carpenters and joiners, 38,143; bricklayers, 23,231; mason paviours, 7,514; plumbers, 7,503; painters and glaziers, 28,181; plasterers, white-washers, &c., 6,706; paperhangers, 1,808; sculptors, 328; and wood-carvers, 1,632. These figures are stated to be taken from the last published "Occupations of the People." If the description "mason paviours" means masons and paviours, the figures given, 7,514, seem to us to be of doubtful accuracy, for the use of stone in London buildings has largely increased of late years, and we should have thought, would give employment to more than 7,514 people. It is true, on the other hand, that stone paving is not so much used in London as it used to be. The Directory includes lists of County and Borough Surveyors, and other official information; but, as we pointed out in our review of the fifth edition in 1886, the Directory would be improved in usefulness by the addition of a few pages devoted to lists of the Architectural Societies, the Master Builders' Associations, and the principal trade unions connected with the building trades, with names of the principal officers and statistics of membership. Some of this information is given in scattered fragments under different towns; but these fragments form a very incomplete whole, if we may be allowed the expression. We trust that in the next edition of the Directory our suggestions under this head may be adopted.

*Electric Light Fitting: A Handbook for Working Electrical Engineers, embodying Practical Notes on Installation Management.* By JOHN W. URBHART. London: Crosby Lockwood & Son. 1890.

THIS book is addressed to intelligent men already engaged in the work of electric lighting or training for it, and it more especially refers to the branches known as 'fitting' or 'wiring.' The opening chapter deals with central-station work, and it is when considering the means which have to be adopted to overcome the sparking at the commutator of a dynamo machine, that Mr. Urquhart first regards his subject in the light of science. In a paragraph headed "Lead" in the Adjustment of the Brushes, the author says: "It will be found, notwithstanding the calculations of several eminent electricians to the contrary, that even in dynamos with no iron in the armature, as in Siemens's alternator or the Ferranti dynamo, 'lead' must be given to the brushes." Mr. Urquhart ought to be truly grateful to all eminent scientific men for giving him, as they almost invariably do, opportunities of showing the superiority of his own methods. When one of the author's "eminent" men makes a calculation the result is hopelessly wide of the truth; if a consequence of theory is given it agrees in no way with fact. These little peculiarities, however, do not in any way detract from the value of the work, for we need hardly say that in every case Mr. Urquhart is able to give the true solution or explanation by virtue of his own experiences. The rough-and-ready tests suggested in the next chapter, for the discovery of faults which are likely to occur, may prove useful to those who are unable to use the more accurate methods generally employed by electrical engineers. But the author seems astonished to find that

instruments designed to measure quantities of a certain magnitude will not do equally well to measure others one hundred or a thousand times as great, for he remarks:—"It is curious that scarcely any of the instruments that have been hitherto employed for measuring purposes in the laboratory or class-room have been found useful for the practical work of the dynamo-room."

The descriptions of various pieces of electric-lighting plant and apparatus are good, though telling nothing that is new and cannot be found in the illustrated catalogues of manufacturing firms. An important exception, however, must be noted in connexion with accumulators where 0.5 volt is given as the limit to which the electromotive force may be allowed to fall during discharge; unless this figure is to be taken in a "scientific" sense, it is obviously a misprint.

On the subject of "The 'Dangers' of Electricity," we find ourselves able to agree entirely with the author. His views may be summed up in his own words as follows:—

"... a good deal of discreditable work in the form of wiring has been done by unscrupulous contractors. . . . There is one leading maxim for a contractor putting in electric light, and it is to avoid contracts that do not allow of the best class of material and labour being used throughout."

As the men for whose special use the present volume is intended will be engaged for many years to come in laying underground mains, it might reasonably be expected that a chapter or two should be given up to this most important branch of "fitting," more especially as very little indeed has been published about it and become public property. It has possibly something to do with this fact, that the reader may look in vain for the sadly needed information throughout Mr. Urquhart's pages.

*L'Exposition Universelle.* Par HENRI DE PARVILLE. Paris: J. Rothschild, 13, Rue des Saints-Pères. (1890.)

THIS book, which forms the twenty-ninth annual volume of the series known as "*Casernes Scientifiques*," is a compendious record of the Exhibition of 1889. It is preface by a letter to the publisher from M. Alphand, who, having perused the proof-sheets of the work, says it gives "une idée exacte de la grande manifestation nationale qui vient de se terminer, en jetant sur notre pays un si glorieux éclat." He adds that he deems his own participation in the Exhibition to be the greatest honour of his long career, and goes on to say that "Le talent de M. de Parville s'affirme une fois de plus dans cette œuvre, à laquelle il a su donner une forme attrayante, et je pense que son livre fournira des informations utiles à tous ceux qui se sont intéressés à notre grande Exposition du Centenaire, véritable revanche expulsive des malheurs immérités de la France." M. Alphand's encomiums appear to be fully deserved. The book is pleasantly and clearly written, and the author seems to have availed himself of the best sources of information, for he expresses his thanks to the leading architects and engineers associated with the Exhibition for having placed at his disposal documents, drawings, sketches, photographs, &c. The book is well printed, and copiously illustrated by 700 engravings. Many of these are devoted to the constructional details of the Exhibition buildings, including, of course, the large Palais des Machines and the Eiffel Tower; others consist of general views of the Exhibition buildings and their contents. Some of these engravings, it is true, —notably those showing the construction of the vast roof of the Palais des Machines,—are too small to give more than a reminiscence of the construction, which is perhaps sufficient in a popular book of this kind; those who want more than this can revert to the French and English engineering journals. The book is divided into seventeen chapters, the first of which not only details the preliminaries of the Exhibition, but describes and illustrates previous great international exhibitions, including those held in London in 1851 and 1862. The second chapter is devoted to a description of the site, or rather sites, of last year's Exhibition, and the disposition of the various buildings on the Champ de Mars, the Quai d'Orsay, the Esplanade des Invalides, and in the grounds of the Trocadéro. Succeeding chapters are devoted to the means of locomotion to and from and within the Exhibition; to the



gardens and terraces; to the Palais des Machines, the Palais des Industries Diverses, the Palais des Beaux-Arts, and the Palais des Arts Libéraux; to the mechanical, electrical, and hydraulic services, including the luminous fountains; to the Eiffel Tower; to the Pavillon des Travaux Publics; to the Pavillon des Forêts; and to the Pavillons de la Ville de Paris. Many of the most representative of the contents of these pavilions, illustrating public and municipal works of great importance, are figured and described. The sanitary administration of the City of Paris is treated of at some length, and is not the least interesting topic of this very interesting book.

**The Works Manager's Handbook of Modern Rules, Tables, and Data for Civil and Mechanical Engineers, &c.** By WALTER S. HUTTON. Fourth Edition. London: Crosby Lockwood & Son, Stationers' Hall Court. (1890.)

THIS excellent handbook has been noticed by us at some length on the occasion of the appearance of earlier editions, particularly the second (see the *Builder* for September 5, 1885). The book is well printed, and contains upwards of 150 illustrations. This edition, we are assured on the title-page, has been carefully revised and partly re-written, and we are glad to see that the author has acted upon some of the suggestions made by us, and has inserted a variety of new matter relating to steam-engines and gas-engines, further information as to pumps, and useful practical data for water-supply. The work will be found exceedingly useful for reference.

"Waterworks Statistics," 1890, edited by Charles W. Hastings (London: Hazell, Watson, & Viney, Creed-lane, E.C.), is a very useful compilation. This, the tenth edition of the book, contains more information than any previous edition, columns having been added for "storage capacity" and "daily consumption per head of population." But it must be added that the figures recorded in these two columns are few and far between. This is evidently not the fault of the editor. The figures regarding the London water companies are of special interest just now, and they will be found in this book.

"Gas-works Statistics," 1890 (same editor and publishers as the foregoing work), has now attained to its twelfth edition. It is very carefully compiled, and gives not only the quantity of gas made and the dividends paid, but the number of consumers, the quantity of coal carbonised, the price charged to private consumers and for public lamps, the number of street lamps, the illuminating power of the gas, and other information relating to the gasworks of Great Britain, Ireland, and the Continent.—*The Antiquary* for August (London: Elliot Stock) is a good number. Its contents include an article on "A Recent Visit to Pompeii," by Prof. Frederick Halbherr; some interesting accounts (from MSS. by Sir Edward Pytts, Knt., 1588-1618) of the cost of labour and materials in building the Manor House of Kyre Park, Worcestershire (edited by Mrs. Baldwin-Childe); a paper on Monumental Brasses in Yorkshire, by R. H. Edleston; and several other articles of interest.—*Cassell's Magazine* for August (London: Cassell & Co., Limited) has a short article calling attention to "Two Little-known London Libraries," viz., the Patent Office Library and the Ronalds Library of the Institution of Electrical Engineers. "Few persons" (remarks the writer) "outside the circle of inventors and patent-agents are aware of the existence of an excellent scientific library in the very heart of London,—namely, the free library of the Patent Office, in Southampton-buildings, Chancery-lane. Still fewer know of another which is also open to the public at certain times, and contains the best collection of electrical books in the kingdom. This is the Ronalds Library of the Institution of Electrical Engineers, at 4, Broad Sanctuary, Westminster Abbey. The former is open every week-day from 10 a.m. to 10 p.m.; and the latter is free to visitors unconnected with the Institution from 10 a.m. till 8 p.m. on Mondays, Tuesdays, Wednesdays, and Fridays, and on Thursdays and Saturdays from 10 a.m. till 2 p.m." This collection, the well-known late Sir Francis Ronalds, the well-known telegraph inventor, to the Society of Telegraph Engineers, now the Institution above named, and it has been further enriched by a large donation of rare and valuable works belonging

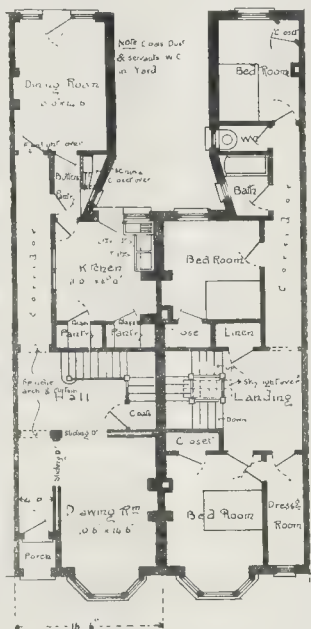
to Mr. Latimer Clark, F.R.S."—*The Sunday at Home* for August (London: 56, Paternoster-row) contains an engraving and description of Archbishop Whitgift's monument, in Croydon Parish Church.—*The Boy's Own Paper* (published at the same address) contains two illustrated articles on "Figure-heads of Famous War-ships." One of the illustrations to these articles is an engraving of the picture by Mr. H. S. Marks, R.A., entitled "Old Friends."

## Correspondence.

To the Editor of THE BUILDER.

### AN AMERICAN SUGGESTION FOR THE IMPROVEMENT OF EIGHT-ROOMED HOUSES.

SIR,—I have seen with much interest the letters on, and improved plans for, an eight-roomed house. While in England I lived in a suburb not far from London, on the London and North-Western Railway, where miles of the "everlasting" type of house were constantly going up. I can therefore fully realise the necessity for improvement. I send you the



enclosed plans of a house, showing what an American would do under the same conditions. The house contains the usual feature of the drawing-room, entering from the hall with sliding-doors, and as the dining-room would be only used for meals, I have placed it at the back and connected it by a butler's pantry (containing sink and china-cupboard over) to the kitchen, which contains two glazed earthenware laundry-tubs in lieu of the usual copper. The bedrooms have a closet to each in the usual way.

ARTHUR CLAPTON.

46, Eagle-street, Albany, N.Y.  
July 8, 1890.

### "THE BERMONDSEY PUBLIC LIBRARY COMPETITION."

SIR,—On February 3 last the Vestry of Bermondsey approved the plan submitted by myself showing the land proposed to be appropriated for the Public Library. I did not at that time contemplate the opening of any windows on the north and east boundaries. The fourth condition of the Instructions, which were approved by the Commissioners prior to being issued, is equally explicit to the same effect, nor up to the present moment has any sanction been given by the Vestry conferring a right to open such windows.

With reference to the awards, I can only

state that they were not made in accordance with my recommendations.

GEORGE ELKINGTON.

95, Cannon-street, E.C., Aug. 6.

SIR,—It may interest some of your readers who sent in designs for the above to know that we wrote to Mr. Harrison, Clerk to the Commissioners, asking whether windows might be opened on the boundaries adjoining the Town-hall, and were informed that they could not. Also that on the morning the designs were to be delivered the Commissioners held a meeting, and proceeded to examine the designs which had already arrived.

Do not the conditions of competition constitute an agreement between the Commissioners and the competing architects? If so, would not some combined action on the part of the latter be advisable?

The conditions state that the Commissioners reserve to themselves the right of selecting the design to be adopted, but do not confer on them the right of selecting a certain number, and awarding the premiums, without first submitting the matter to them for their assent.

Briefly, the competition has been conducted in a most irregular and unfair manner, the Commissioners having repudiated the most important conditions, and arrogated to themselves powers they were not at liberty to assume.

This is not a question of person but of principle, and it is quite time the members of the profession took measures to secure fair play.

GIBSON & RUSSELL.

34, Craven-road, W., August 6.

SIR,—I was a competitor in this, and received my drawings back (minus the specification and report) just prior to receiving the *Builder* of last week.

I have read with interest Mr. Cole A. Adams's letter on the subject in your issue of the 2nd inst. (p. 92), and I have again looked over the "Instructions to Architects" issued by the Commissioners. No. 4 was a subject to which I paid great attention, as the property belonging to the Commissioners and that of the Town Hall are as separate and distinct as any other adjoining owners, and as such I treated.

Note the last paragraph but one of the Instructions: "Any design," &c., &c., "or which does not comply with the other conditions and instructions, shall be excluded from the competition!" Plain, certainly. Again, in the last paragraph but four of "Instructions," it is stated that if tenders do not come within 10 per cent. of architect's estimate, then another design may be selected, and so forth. To be brief, fifty-four architects have lost time and money. What other profession or business throws away so much time and money on such work? And many can ill afford it! Can this sort of thing last?

HARRY T. PERCIVAL.

97, Mill Hill-road, W., Aug. 4.

### SUB-CONTRACTING IN THE BUILDING TRADE.

SIR,—With reference to the report published in your issue of June 28 (pp. 468 and 469), also Mr. Robbins's letter in your issue of July 3, and Mr. Mr. Graham's letter in your issue of 12th ult. (p. 29), we would be glad if you would permit us to add a few remarks to same.

We cannot agree with the general tone of the arguments of the deputations of the building operatives, because architects' specifications are generally very rigidly drawn; the best materials and finishes are invariably specified. A clerk of works is generally appointed to see that the specification is faithfully carried out. When this is done, and the contract finished to the satisfaction of the architect or engineer, a certificate to this effect is given and payment made to the contractor on production of same. Now it follows that if the clerk of works and architects (or engineers) pass and give certificates for "scamped" work or improper materials, they are as much to blame as those who put in these things. Evidently, then, if the arguments be true, it is necessary for the profession first of all to "set their houses in order," and then to do business under the same will perforce do likewise.

The old question of wages is a very trying one. We cannot agree that any employers of labour should be compelled to pay the "union" rate of wages. Our experience of "union" men is, that they consist (like all other men) of good, bad, and indifferent. If they are to be paid the "union" rate, either the better men will be paid too low, or the worst men too high. Hence the good man, finding he receives no better wage than the inferior one, at once takes things easy, reducing his day's work down to about the level of the slow, or careless, or indifferent (possibly drunken and dissolute) hand, instead of the latter striving to attain the abilities of the former, which, in the millennium of the union, would mean harder work for each, and no extra pay. Or, looking at it in the abstract, it seems no matter what are the man's capabilities, he has only to join a "union" and his wages are assured at the highest rate, and one day he may be paid less! Such an idea must present itself



as both impracticable and impossible to all right-thinking men.

Now as to "sub-letting." It is possible this may be carried to an undue extent, and that "scamped work," or inferior (and sometimes totally different) material may be used to what is specified, but it would seem the profession and their clerks of quarry should have such practical knowledge as to prevent all this. But assuming not, then surely there cannot be any objection to respectable, proved, established firms, of good repute (possibly "specialists," as it were, in their particular line), still doing their work as quarry-contractors, "as hitherto." If this system is carried to an undue extent, the remedy appears to lie not in architects and others prohibiting "sub-letting" in toto, but in approving of the firm to whom the contractor proposes to sub-let the work. Being large employers of quarry labour, we may be forgiven if we add that, in our opinion, no better firm could be than quarry-owners, because they not only have a reputation for good work to maintain, but are very jealous to see that only the most suitable stone is used, as specified, having the further interest in maintaining the good reputation of their stone, as well as labour, and it will be at once seen that by so doing the circumstances are improved. But weighill alludes, viz., "so that when people thought of a Portland stone, the front it often happened that other stone was mixed with the Portland," are omitted, and the proper material is assured, as no Bath stone quarry-owner could attempt to palm off say Weldon stone, or a Portland quarry owner endeavour to pass the inferior "Bath" stone. Mr. Weighill's experience of machine-worked stuff is very original, but putting aside the fact that machine-worked stone is as much a necessity nowadays as machine-worked wood, particularly to compete against terra-cotta, which, we believe, cuts against masons more than anything else alluded to by the various speakers, we have there are not a few turned balusters in London of machine-worked stone, and machine-worked stone equally well with perhaps the hand-worked plinth, dies, and capping to same. We allude to these, not as in any sense the only examples of machine-worked stone,—because there is that which comes from the ordinary planing and moulding machine,—but because every inch of face of anything turned upon the machine-tool and is exposed, whereas in a cornice or string-course, one of the faces only is seen that has passed through the machine. We may add, however, that, assuming Mr. Weighill's statement to be correct, viz., "when such machine-worked stuff was new and wet, it was often possible with one's thumb-nail to scrape off the surface to the extent of an eighth of an inch, owing to the pulverisation of the surface by the machinery"; it is also equally possible to do so from under the "stuns" of a mason's chisel; but where the precaution is taken to rub the surface of all stone, whether machine or hand worked, the matter of which Mr. Weighill speaks is thus removed, and we may add, further, that, if properly managed, the pulverisation which, over occurs, or can be detected, either with one's thumb-nail or any other medium, as can be daily proved in our yard.

Mr. Weighill's experience as to quarry-worked stone also appears to be very unique. Indeed, so much, that some time seems to have elapsed before he comforted himself to the remarks, which appear so entirely contrary to facts, that we cannot permit to endeavour to rectify his apparent incorrect statements. Having stone worked at the quarries does not mean employing "cheap labour." At least, in our district we pay as high a rate as we believe is paid anywhere in the provinces, and higher than obtains in many parts of the country where there are no quarries. The secret of the cheapness of quarry-worked stone lies in the fact that the quarry people, having (1) a large stock to select from, are able to select blocks to cut with a minimum of waste; (2) they have to pay carriage upon the net weight of the stone only, whereas worked, instead of upon waste as well; (3) the stone is delivered in its finished state direct from the quarries to site, instead of as is the case with block stone, delivering it first to the builder's yard to be cut and worked, and thence to the site,—double cartage; and (4) the quarry people lay themselves out for the best and quickest manipulation of their own stone, using the most modern and most effective machines or sawing, rubbing, turning, planing, moulding, &c.; and their masons, who are constantly working upon their particular stone, are able (as can be readily understood) to do more work upon that stone than a mason could in a builder's yard, who in turn has, perhaps, to work Portland, Bath, and (for the sake of variety), perhaps a little marble (of all sorts), then some granite, after which he has to turn his hand to some Caen, Ancaster, Jam Hill, Mansfield, or Dunfriess, &c.; after which he may be sent on to a job to chip down some badly-made or badly-fitting terra-cotta. A builder's quarry, too, let it be ever so good and extensive, that is, that is to be used upon, perhaps, some of these stones, cannot be more so effective upon any particular material as a quarry-owner, whose machines are, from year's end to year's end, constantly engaged upon the same stone, and specially made and adapted for the same, the grit used is the most suitable, and even the speed regu-

lated to be the most effective upon their particular stone.

As we have said, quarry-owners having also a reputation for the durability of their stone to maintain, would, and do, see the quality they work up and send out is not only well finished (not scamped), but that the stone is of the most durable quality, of the sort specified, possibly, and most certainly not substituting for, or mixing with, an entirely different stone, as Mr. Weighill says other (not quarry) sub-contractors do.

Mr. Gregory's lamentations, we think, can easily be explained, not by the stone being worked out of London so much, as the large quantity of brick and terra-cotta now used, which has been brought about to a considerable extent by masons (or the leaders of masons) themselves, owing to their unreasonableness and the great strike in which they were engaged some time since, when the new Law Courts were building. We observe, however, that he attributes the proclivity to "slavery" over the stone to the London sub-contractor, whereas Mr. Weighill (in his after-thought) says this is a quarry sub-contractor's trick! Either Mr. G. or Mr. W. is incorrect, or both are right, perhaps; then, if so, why need Mr. Weighill complain of what his London friends are as guilty of, apparently? Mr. Gregory's remarks are evidently directed to soft stone, in which it is perhaps possible to resort to the scamping he mentions with advantage, but not so in the harder stones, and if his statements be true, the quarry-worked stone becomes the more necessary, because, as stated earlier, presuming the workmanship to be as bad as the London work is stated to be, the architect is at least sure of getting the quality of stone he wishes, whereas he is not sure of even that much from the merciless London sub-contractor, according to Mr. G., who says, "Needless to say that one kind of stone was often substituted for another with impunity, the substitution never being discovered by the clerk of works or the architect."

Mr. Macvicar Anderson's reply seems to us very much to the point. And we believe that if the North of England method were more generally adopted, a much better result would obtain. Professor Aitchison seems afraid this may entail more work on the architect; but if so the result were better; architects would not object to the extra work we feel sure.

Following the line of argument used by the members of the deputation quoted, we countryfolk might as strongly protest against the using in the country of stuff manufactured in London, and if the objection were practised on both sides, commerce would receive a severe check. And again, a hue and cry has long been made against country people flocking to London; but if their means of living is to be still further taken from them here, then London will have a still larger crowd of these people to contend with.

Mr. Robin's letter in your issue of the 5th ult. (p. 3) hardly calls for comment from us, except that we observe our recent remarks second his replies to Mr. Anderson's and Professor Aitchison's remarks.

Mr. Graham's letter in your issue of the 12th ult. quite agrees with our view, and we may add that, although our operations do not go further into the building trade than the quarrying, sawing, working, and where required, fixing of stone, we have been long trying to devise a means of co-operation with our workmen, and although we have not yet been able to do so, we trust we shall soon be in a position to admit them on similar lines to the Co-operative firm at Brixton to which he draws attention.

July 30, 1890.

Although "Quarry-Owners" have been somewhat tardy in their rejoinder to some of the allegations made by the deputations to the Institute of Architects, we print their letter, on the principle of "*Audi alteram partem*." The matter is also commented upon in our first "Note" this week.

#### THE VENTILATION OF CHURCHES.

SIR,—The statement in Mr. Standage's opening remark on page 92 that a discussion upon this subject in your columns would do good, is quite right, but his own remarks show that if a proper practical remedy for the bad air in churches is to be got, we must have some real knowledge of the cause of this bad air.

Mr. Standage blames the carbonic-acid gas exhaled from the lungs, which, he says, is very heavy, and so "it sinks down to the ground;" and, therefore, he wishes some process that "would lift off from the ground this heavy poisonous gas and clear it away." Now if it were really true that the carbonic-acid gas was so "very heavy" and that it "really fell down to the ground," the best way to get rid of it would simply be by boring, making, or leaving holes in or near the floor to let it run away like water. When we do try this, however, we find that instead of this "very heavy"  $\text{CO}_2$  running down these holes in the floor, it is the ordinary air, fresh or otherwise, that blows up! The law of gravitation would, therefore, appear to be set at naught here. Carbonic acid gas is half as heavy as ordinary air, but the energy involved in the law of the diffusion

of gases prevents the carbonic acid gas sinking to the ground, as Mr. Standage says, and causes it to be equally distributed. It is owing to this that the proportion of  $\text{CO}_2$  at the top of a mountain is the same as at its base. When the  $\text{CO}_2$  is exhaled with the expired air from the lungs to the extent of 100 times more than is inhaled, it is warm, being heated to 97 deg., and so it rises with the other air towards the ceiling, and seeks to get out there; but, on account of either no provision, or inefficient provision, being made to let it out, it gets cooled, and then falls, and all the more so as it is displaced by the warmer air continually rising.

We want, therefore, simply in the ceiling of a church one or more sufficiently large openings properly fitted to let this warm, vitiated air out, and to carry it off as it rises upwards. This can, generally speaking, quite easily be done by automatic means, and without the continuous expense of a fan, if a good wind-acting exhaust ventilator is set up above the ridge, and with a large enough pipe. Further, as the down-draught at times through a large pipe would be a nuisance, a proper self-acting anti-down-draught appliance should be used; and when this is done, with proper fresh-air inlets, complaints of bad air in churches from the persons assembled would cease. When architects and others put up only 10 or 15 in. pipes in place of 24 in. or 30 in. diameter (or their equivalent), it is no wonder that bad and short-allowance systems of ventilation in churches give disagreeable results.

W. P. BUCHAN.

Glasgow, August 2, 1890.

### The Student's Column.

HOT-WATER SUPPLY FOR BATHS, LAVATORIES, ETC.—VI.

INDEPENDENT BOILERS: continued.

INDEPENDENT boilers can be fixed in any position where convenient for stoking, in a basement or cellar, or at the side of the kitchen range, and the smoke-pipe can be connected into the kitchen range flue. If a vertical shape is selected, it will occupy but little room.

Independent boilers can be had in every conceivable design and size, but there is not one yet made that is worthy of any particular recommendation for this work. There are great numbers of excellent boilers so far as their ability to heat water is concerned, but as hitherto they have hardly ever been used for other than heating purposes only, manufacturers have not been called upon to consider the "fur" question; this is the drawback to all the existing patterns, as there is hardly one which will admit of easy cleaning.



FIG. 10

Fig. 10 represents in section a vertical domestic top cylindrical boiler, one occupying little space and having every convenience for stoking, &c., but a circular boiler of this sort is most difficult to clean out, and it should have at least two manholes and three or even four macho-holes (holes, about 1½ in., at the lowest point for scraping out the loose "fur," as the hand cannot be inserted); this illustration shows a boiler having the waterway terminating at a level with the fire-bars, and an improvement is effected (but at a little more expense) by having the waterway continued to the bottom



as fig. 11, the greater portion of the fur is then found below the fire-level, where no harm can

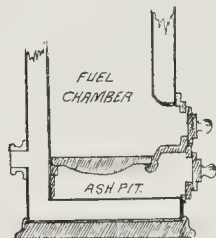


FIG. 11.

be done, and what adheres to the flat boiler-plate surface around the fire is more easily removed than from the angle as in fig. 10.

The fuel used with these boilers is usually coke, an economical and clean fuel, and if the boiler is filled up to the top the charge is sufficient to last a number of hours, varying with the size of the boiler and the way the dampers are set or regulated. The speed of combustion is regulated by a valve at the furnace front, and it can be further regulated by having a valve damper fitted in the smoke nozzle or pipe. The coke fuel must be broken small, about walnut size, otherwise it will wedge or "bridge," and the fire burn hollow by reason of the fresh fuel not falling as the lower portion of the charge is burnt away.

A better shape for cleaning purposes is as

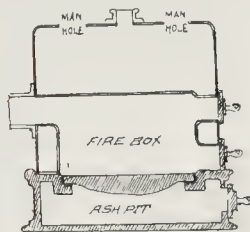


FIG. 12.

fig. 12, as it can have one large or two ordinary lids fitted at the top with mudholes below, but unless fitted with a "hopper" top to take a charge of fuel, it cannot be kept burning for long without attention, and another slight objection is that this shape occupies more room than the cylindrical pattern.

It remains for some one to introduce an independent boiler for hot-water supply of a character nearer perfection than we have at present, as, for instance, all small or medium-sized vertical boilers, when fitted with man-lids, have the objectionable wrought-iron plates secured by a number of set screws, and several other little difficulties present themselves owing to the necessity of removing the fur, an operation that was not anticipated when they were designed.

In ordering an independent boiler the following information is required before the maker can proceed:—State the position that the smoke-nozzle is required in, whether on top or whether projecting from the back or either side (the furnace and stoking-doors are always situated in front); state what size pipe is being used, and indicate where the return-pipe is to be connected (the flow-pipe should always start from the top); indicate where the man-lids should be put, so as to be easily accessible for removal; state whether  $\frac{1}{2}$  in. or  $\frac{3}{4}$  in plate is required (the latter is about one-fifth more expensive than the former), and it is much the better to mention that a valve-damper is required in the smoke-nozzle, as few makers provide this unless specially ordered.

Before proceeding to treat the various fittings, tanks, pipes, &c., used in this work, it will perhaps be best to describe the two most common forms of apparatus in general use, as by this means the explanation devoted to appliances will be rendered more clear.

#### THE TANK SYSTEM.

This is the style of apparatus that succeeded the simple arrangement described in the first paper. Strange to say, it has never had any distinguishing name given it, and the term, "tank system," is only now applied to distinguish it from the cylinder system.

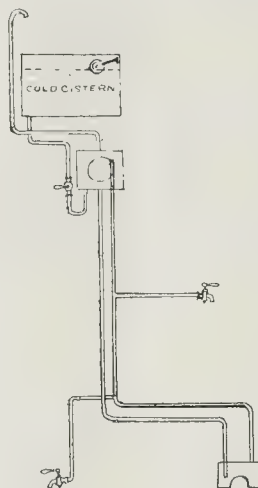


FIG. 13.

Fig. 13 is the general arrangement of this system, and one of the chief features about it, as the name implies, is the tank, which is always fixed somewhere above the highest draw-off service, commonly in the bath-room, or an upstairs linen closet, or in the roof. If the tank is fixed anywhere below the draw-off services, it practically converts the apparatus into the cylinder system, as will be understood from the next paper.

As to the position of the tank, this needs some consideration; in the first place it must be below the cold water cistern; occasionally it is fixed on a level with this cistern, but in principle this is bad and should be avoided, as the least shortness in the cold water supply interferes with the hot water, and, what is worse, fixing the tank on a level with the cold water cistern means necessarily that it is to be fixed in a cold position, in the roof or in a cistern-room. This is one of the strong objections to this system, viz., that the tank being at the top of the building must be in a cold situation, and the efficiency of a hot water supply apparatus is in ratio to the amount of heat it can keep within the water, not the amount of heat it can dissipate, or be robbed of by cold surroundings, which is the aim and object of a heating apparatus.

To make this system at all economical as well as successful, the tank must be kept warm, or in a warm position. This can be done either by having the tank within a closet or in a warm room, or much better by casing and packing it with some poor conductor of heat,—sawdust, hair, &c.; the insulation of tanks, pipes, &c., will be more fully treated in a later paper.

When the position of the tank is located, a service-pipe, known as a "flow"-pipe, is carried from the highest point in the boiler to the tank, where it is connected near to the top, either through the side, or through the bottom and projecting up inside, as shown in the illustration. This is the pipe up which the water finds its way from the boiler immediately heat is applied to it. To allow of the corresponding volume of cold water coming down to replace the hot, a second pipe, called the "return" pipe, is provided, starting from a low position in the tank, either from the bottom, as illustrated, or from a low point in the side, and from there it is carried down to near the bottom of the boiler, usually through the top, projecting down inside as shown. It should be noted that it is customary to speak of the "flow"-pipe as proceeding from the boiler to the tank, and the "return"-pipe as from tank to boiler.

The flow-pipe should always be connected

from the very highest point in the boiler, and on no account must it be screwed through the boiler-plate, so that it projects down inside in the least degree, otherwise an air-chamber will be formed. It will be readily understood that if this pipe project through the top plate, as in

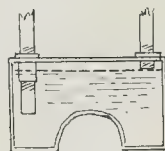


FIG. 14.

fig. 14, the boiler cannot be filled beyond the end of this pipe as shown, as the air cannot be expelled. As an example, supposing an ordinary glass tumbler has a hole drilled in its side, and the tumbler was then inverted and lowered into a vessel of water. The result would be that the tumbler would have the water rise up within it as far as the top edge of the hole, but little further (only so far as a certain compression of the air will allow), and the air in the upper portion of the glass cannot be expelled except by having another hole made at the top (or by shaking the glass violently). This formation of an air chamber in the boiler is a very prolific source of trouble, and it occurs with the greatest frequency either through carelessness or ignorance on the fitter's part. It frequently happens that the fitter connects the flow-pipe into the side of the boiler, one of the worst of practices, and only to be tolerated under some very special circumstance: when this is done the air is got out of the top of the boiler by packing the manlid, but only partially securing it; so that when water is allowed to run into the boiler, the air is driven out and the lid then finally tightened up.

The particularly ill results experienced from the cause under discussion are that it is accountable for the violent noises and shaking that is sometimes experienced with new work (noises in old work are generally accounted for by furred pipes) as when the boiler is heated the flow pipe, the violence exhibited cannot be wondered at. A further annoyance and source of trouble arising from this cause, and which is quite as objectionable as the noises, is the fact that as the water is not always in contact with the upper boiler plate, the manlid packing quickly gets destroyed and wants renewing, and this particularly with india-rubber manlid collars.

#### OBITUARY.

MR. CHARLES ROACH SMITH, F.S.A.—We hear with great regret of the death of this veteran antiquary and author, which took place at his residence, Temple-place, Strood, on Saturday last, at noon. Only a week or so before, he was presented with the medal struck by the Society of Antiquaries of London in recognition of his life-long services to archaeology. The presentation was made privately, consequent upon the critical state of the recipient's health. Moreover, a surplus of over 100 guineas accompanied the medal, the presenting of which was entrusted to his intimate friend, Mr. G. Payne, F.S.A., on behalf of the subscribers. His decease is a national loss; but in Strood, where, according to the *Maidstone and Kentish Journals*, he has been the means of aiding many young men to rise in life, he will be missed by all classes of the community. He was a prolific writer, the chief of his works being published by subscription. At the time of his death he was engaged on the closing volume of his "Retrospections—Social and Archaeological." He was justly regarded as the greatest modern authority on Roman antiquities in Britain. Only two or three years ago he took part in a controversy as to the walls of Chester, and in former years he was a valued contributor to the columns of the *Builder*. According to "Men of the Time," he was born at Landguard Manor, in the Isle of Wight, early in the century, had written "Collectanea Antiqua," seven vols., 1845-60; "The Antiquities of Richborough, Reculver, and Lydney," 1850, with supplements on Lyme and Pevensey, 1852-3; "Illustrations of Roman London," a work based on the author's personal researches made during his residence in the City of London, when he formed the collection of local antiquities described in his



"Illustrated Catalogue of the Museum of London Antiquities," 1854. This collection was transferred to the British Museum in 1856. Mr. Roach Smith's earliest antiquarian papers were printed in the "Archæologia;" and he contributed to the earlier volumes of the British Archaeological Association, and to the *Gentleman's Magazine*, in which he wrote the monthly article called "Antiquarian Notes." With Mr. T. Wright he founded the British Archaeological Association, the forerunner of the numerous archaeological societies, and many of his contributions are in its "Journal." In 1856 he edited the "Inventory of the British Museum," by Bryan Faussett. Mr. Roach Smith had devoted much attention to pomology, and especially to the culture of the vine in the open ground; and in 1893 he published a pamphlet, which had a large circulation, "On the Scarcity of Home-grown Fruits in Great Britain, with remedial suggestions" (second edition 1893). In 1868 was printed privately "Remarks on Shakespeare, his Birthplace," &c.; and in 1870 was published "The Rural Life of Shakespeare, as illustrated by his Works." Mr. Roach Smith also edited the Catalogue of the Anglo-Saxon antiquities discovered at Faversham, Kent, and bequeathed to the South Kensington Museum by Mr. Gibbs. Since his retirement from London to Strood, Mr. Roach Smith has actively assisted the Kent Archaeological Society, and he has contributed many papers to its *Archæologia*. He has also been a member of the Society. He has received the first Medal of the London Numismatic Society, of which, for some years, he was secretary. He assisted in editing the "Dictionary of Roman Coins," by the late Seth W. Stevenson.

#### GENERAL BUILDING NEWS.

**PROPOSED MUNICIPAL BUILDINGS FOR COVENTRY.**—The Coventry City Council were on the 29th ult. occupied for some time in discussing the scheme for new municipal buildings. The Estates Committee brought up a report recommending St. Mary's street and the adjoining back site, and that the provisional order be applied for to carry out the work. The adoption of the report was proposed by the Mayor and seconded by Alderman Marriott, the latter being the author of the scheme. On being put to the vote, the scheme, no hint of the cost of which was given by its advocates, was approved by a large majority.

**CHURCHVILL, HANTS.**—Repairs and to some extent restorations are being carried out at Christchurch, under the supervision of Mr. E. Burton, architect, of Bournemouth. The roof over the Lady Chapel, which has been for some years in a very decayed, and in consequence dangerous, condition, has just been restored, with the adjacent screen and aisle roof over. There is a large room over the Lady Chapel which was formerly used as a schoolroom, and the above-mentioned roof is therein exposed to view. The roof is of very massive wrought oak, and is slightly moulded, and as nearly as possible an exact reproduction of the old roof taken down. The tie-beams are 10 in. x 14 in. wide, and all the other timbers are correspondingly large. Great difficulty was experienced in obtaining these tie-beams without defects. The roof over the south nave aisle has also just been restored with oak, and corresponds with the old roof taken down and the new one on the north side of the choir. The restoration of the south nave aisle roof, the lath and plaster screens, put up as a protection against the cold occasioned by the bad state of the old roof, have now been removed, and the triforium is once more open. It is proposed to open the arches on the north side when funds are forthcoming.

**NEW CORRIDOR AT THE BIRMINGHAM COUNCIL HOUSE.**—The *Birmingham Gazette* says that the grand corridor at the Council House has now been connected with the Art Gallery by an ornamental iron corridor, which was found extremely useful at the Mayoral reception on Wednesday evening in last week. This corridor is 99 ft. long by 10 ft. 9 in. wide, and 14 ft. high from the lowest point of roof. It is constructed of iron and glass, with lean-to roof, and is carried on two columns 34 ft. high from courtyard below, with a lattice girder, 2 ft. 10 in. deep, spanning the whole length of 99 ft. The side is formed of cast-iron stanchions and panels, with ornamental sashes glazed with double muffled glass. The roof is formed of wrought-iron rafters glazed on Heliwell's patent system. The rafters are supported by semicircular arches, filled with foliated ornament—similar to that in the industrial hall of the Art Gallery. The whole of the work has been designed and carried out by Messrs. Hart, Son, Peard, & Co., under the direction of Mr. Wheeldon, of the City Surveyor's office.

**GAS OFFICES, WESTMINSTER.**—The Gaslight and Coke Company are making extensive additions to their offices in Horseferry-road. The roof of the strong room is on Fawcett's fireproofing system.

**MEMORIAL CHAPEL, TOTNES CEMETERY.**—A memorial chapel is about to be erected in Totnes Cemetery. Mr. F. J. Reeves, of Totnes, is the architect, and Mr. J. H. Foaden, of Ashburton, is the builder.

**BOARD SCHOOLS, POULTON-CUM-SEACOMBE.**—The School Board of this place has decided to erect a school for 1,200 scholars. A large site has been selected after an examination of six local schools by various architects the Board has selected Mr. T. Mellard Reade, of Liverpool, as the architect for the school.

**DEVELOPMENT OF BARRY, SOUTH WALES.**—On the occasion of the recent visit of the members of the Merthyr Chamber of Trade to Barry Dock, Mr. Lewis Lewis, estate agent, made a statement to the effect that about a quarter of a million of money was about being spent upon house property, public works, &c., in the Cadoxton and Barry district. The announcement was received with a certain amount of surprise, not to say incredulity; but after entering minutely into the details of the calculation, the *Western Mail* says that it is highly gratifying to find that the estimate is greatly under-estimated. The Local Board have already passed plans for the erection of buildings on the Brooks Estate representing 100,000% in value. On Messrs. John James & Son's estate plots have been arranged for 500 houses to cost 3000 each, representing another 150,000. In Dockview-road and Thomas-street (Barry Dock) buildings of the value of 80,000, are in course of erection or about being commenced. The Kingland Building Company have decided to expend 27,000, upon houses on their estate, and the Weston Syndicate are actually building houses to cost upwards of 20,000. Mr. John James, contractor, has commenced an hotel in Weston-street which will cost fully 10,000, while plans have been passed for house property to the value of 10,000, on the Mai Estate. The Holton Land and Building Company, too, are laying out the sum of 6,000, upon houses on their property, while at the last meeting of the Local Board plans were submitted for the erection of 180 houses on a portion of the Wenwoc Castle Estate, representing an outlay of over 30,000. Mr. Alderman John Cory, J.P., Chairman of the Local Board, has also just arranged to pay 7,500, for thirty acres of land in the parish of Cadoxton for building purposes. After mentioning the main sewerage scheme, which the Local Board are carrying out at a cost of 25,000, the construction of the new graving dock at an outlay of at least 50,000, and other items, the *Barry Dock News*, summarizing the various items, says:—"We have thus a clear total of half a million of money, the whole of the work in connexion with which will be in hand within the next three months."

**PROPOSED NEW POST-OFFICE, BRENTWOOD.**—The *Essex Chronicle* says that the plans of Mr. A. T. G. Woods have been accepted for a new post-office to be built in the High-street, at the corner of St. Thomas's-road, and Mr. Woods has been appointed architect. The building will comprise the post-master's house, an office 21 ft. by 19 ft., a spring room 35 ft. by 20 ft., instrument, and other rooms.

**PROPOSED NEW RAILWAY-STATION AT ABERDEEN.**—On the 4th inst. the Aberdeen Town Council, on the recommendation of the Improvements Committee, agreed to entertain the revival of the question of a passenger station at Schoolhill in connexion with a proposal submitted by the Great North of Scotland Railway Company for placing a turn-table near Union Bridge.

**THE PROPOSED ST. MICHAEL'S BELL TOWER, COVENTRY.**—On the 1st inst., the working men's committee, which has canvassed Coventry for signatures in favour of a bell tower for St. Michael's church, waited on Mr. George Woodcock, at the King's Arms, to present the memorial to him. Mr. Woodcock has promised 5,000, towards the proposed work, and the memorial of 8,500 house-holders was intended to give support to his advocacy of a new tower for the bells. Mr. Woodcock said Coventry would have the bell tower and as hand-some a campanile as could be found either in England or on the Continent.

**PROPOSED HANDEL COSHAM MEMORIAL INSTITUTE, BRISTOL.**—It has been resolved at a meeting held at Bristol to raise funds for the erection of a mechanics' institute in East Bristol, as a memorial of the late Mr. Handel Cosham, M.P.

**A NEW LECTURE-HALL AT COGGESHALL, ESSEX.**—was opened on the 29th ult. The buildings externally are faced with yellow stock bricks, with white brick arches and bands. The work has been carried out by Messrs. Gardner & Son, builders, of Coggeshall, at a cost of about 7000. Mr. Charles Pertwee, of Chelmsford, was the architect.

**ST. PETER'S CHURCH, BOWDON, CHESHIRE.**—The Building Committee have accepted the tender of Mr. James Hamilton, contractor, Altrincham, for the erection of St. Peter's Church, Bowdon. The architects are Messrs. Tate & Poppelwell, of Mosley-street, Manchester. The work is to be commenced at once and pushed on at all speed.

**BOTHWELL PARISH CHURCH, N.B.**—On the 3rd inst. Bothwell Parish Church was re-opened, after being closed for four months for alterations, consequent on the erection of an organ. The instrument, enclosed in an oak case, has been built by Foster & Andrews, Hull. Various structural improvements in the building have been carried out by Messrs. Bruce & Hay, architects, Glasgow. The cost of the organ and alterations, excluding personal gifts, is 1,200.

**SCHOOLS, BABBACOMBE, DEVON.**—The corner stone of a new day-school for infants was laid at Babbacombe, South Devon, on the 2nd inst. The cost of the schools, which are being erected by Mr. Sampson Hunbury, J.P., as a memorial of his daughter, Helen Marguerite, will be 7000. Mr. F. Mathews, of Babbacombe, is the contractor.

**PROPOSED COTTAGE HOMES AT LLANTWIT VARDRE, SOUTH WALES.**—The *Western Mail* says that the Pontypridd Board of Guardians have decided to erect cottage homes for pauper children, and that with that and in view they have purchased a very eligible piece of ground in Llantwit Vardre, facing the main road from Llantisant to Pontypridd, about ten acres in extent. After several consultations with the Local Government Board, and studying the arrangements of somewhat similar establishments elsewhere, plans have been prepared by Messrs. Seward & Thomas, of Cardiff. The contract has been let to Messrs. Turner & Sons, of Cardiff, for 7,432.

**NEW BUILDINGS, CHELMSFORD GRAMMAR SCHOOL.**—A meeting of the Governors of the Chelmsford Grammar School was held on the 31st ult. The subject for building on the Broomfield-road site is now well in hand, and the *Saver Chronicle* understands that the architect will be communicated with at once.

**NEW COUNTY BUILDINGS FOR SURREY AT KINGSTON.**—The *Survey Comet* gives a description of the new County Buildings to be erected in St. James's-road, Kingston. The elevation will face St. James's-road. The length of the building will be about 160 ft., its depth about 130 ft. The cost of erecting the buildings is estimated at about 35,000. The architect is Mr. C. H. Howell, the County Surveyor.

**SHED ACCOMMODATION, &c., DUNDEE HARBOUR.**—On the 31st ult., at a meeting of the Works Committee of the Dundee Harbour Board, the Engineer reported the completion of the shed erected on the north-west quay at Camperdown Dock, and recommended various improvements to facilitate the working of the traffic, including the removal of the causeway setts with which the area of the new shed is laid, and the substitution of a granite setts pavement. The estimated cost of the work is 4000, but the stone setts taken up will be sufficient to pave all the adjoining parts of the quay. The matter was remitted to a sub-committee, with powers.

**PROPOSED NEW BOARD SCHOOL AT LARGS, N.B.**—The School Board of Largs are now taking steps to procure plans of a new school, for which a site was acquired the other day in the Scots Field, Largs. Accommodation for 700 children is to be provided, and the building will be in two stories. The total cost of erection, including boundary and division walls of play-ground, is not to exceed 5,500.

**THE THEATRE ROYAL, GLASGOW.**—The Theatre Royal, Glasgow, was re-opened on Monday evening last, after having been internally reconstructed under the supervision of Mr. C. J. Phipps, architect, London. The gallery and the upper circle have been lowered 7 ft., and the roof brought down to a corresponding extent by the removal of the old topmost gallery, which was closed three years ago by desire of the authorities. The private boxes at the stage ends of the upper circle have been taken away, and this portion of the house has now been brought more into a horse-shoe shape than formerly. Perhaps the most important improvement has been effected in the dress-circle tier, the boxes at the rear of which have been removed, and a new part formed, called the family circle. It comprises 133 half-crown seats, which can be booked beforehand. The theatre will now accommodate an audience of about 2,600 persons, 1,100 of whom can be seated in the gallery, 800 in the pit, 200 in the upper circle, 170 in the dress circle, 160 in the orchestra stalls, 133 in the family circle, and the remainder in the twelve private boxes, six of which are on each side of the stage.

#### SANITARY AND ENGINEERING NEWS.

**HAYES DRAINAGE.**—The Rural Sanitary Authority of Uxbridge Union have selected the plan submitted by Mr. F. Beesley, C.E., of Westminster, for the drainage of Hayes. The "international" process for dealing with the sewage is to be adopted, and the sludge to be dried by means of presses. According to the engineer's report, the cost of the work is estimated at 8,500, or with the outlying extensions, 10,500.

**A NEW DRAIN-CLEANER.**—Messrs. Merryweather & Sons, of Long-acre, have just brought out a patented drain-cleaning apparatus which they call their "Microbolizer," or "destroyer of drain poisons." We have had an opportunity of seeing the apparatus in action, and it seems calculated to be very effective in cleansing the interior surface of house drains which can readily be brought under its action. There is a great deal of force in Messrs. Merryweather's remark that "disinfectants as at present applied to drains by simply pouring them down are delusions, as the liquid simply runs down the drain, touching in its course the bottom part only." It is claimed that the "Microbolizer" is capable of pumping ten or twelve gallons per minute



of disinfecting fluid with great force over the internal surface of the pipes, removing the impure matter, and washing it away into the main sewer or cesspool. It is made entirely of copper and gun-metal, so as to be free from rust and chemical action, and is fitted with a novel form of jet distributor, with spigots which, being flexible, can be passed through any drain pipe or winding drain. Shortly described, it consists of a length of tubing having at its far end the jet distributor mentioned. The jet distributor is circular on plan, with the jet holes pierced all round it. By means of a small pump, water mixed with disinfectants is forced through this tube and through the holes in the jet distributor, the liquid being thus caused to impinge on the whole surface of the interior of the drain. Messrs. Merryweather & Sons have also, we understand, patented and are constructing a steam-worked "Microbolizer." This machine, although developing 6 indicated horse-power, is on wheels, and easily removable by one man. It is intended for operating on large sewers of any size. The hose pipes or spigots are on movable carriages inside the sewers, and the jets operate work in and back and forward motion, thus securing the thorough cleansing and deodorising of the whole surface of the sewer. If, however, a high pressure water service is available from a hydrant, the steam-worked "Microbolizer" may be dispensed with, and a patent and specially-constructed hydrant standpipe with a "sucker disinfectant ejector" may be used. The pressure of the water causes the disinfecting fluid to mix in the proper proportions with the water, when the operation in the sewer is the same as with the steam "Microbolizer."

#### STAINED GLASS AND DECORATION.

**THE CANTERBURY MUSIC-HALL, WESTMINSTER BRIDGE-ROAD.**—The interior of this music-hall, otherwise known as the "Canterbury Theatre of Varieties," has been entirely re-arranged and re-decorated, at a cost of 5,000*l.*, under the superintendence of Mr. F. Matcham, architect. The alterations comprise a new promenade along each side of the stalls, with fresh tiers of boxes next to the proscenium, in lieu of some private boxes removed from the sides of the balcony; the sliding roof retained. The decorative work has been done by Messrs. Campbell Smith & Co.

**THE BROOKE MEMORIAL WINDOW, ROTHERHAM PARISH CHURCH.**—On Saturday last the memorial window erected by Mr. James Brooke, of Scarborough, in memory of his wife, was unveiled. The window, which is 18 ft. 6 in. wide and 31 ft. high, is of the Perpendicular period. The central subject is illustrative of Our Lord's majesty, the lights on the right and left being representations of apostles, prophets, Virgin, holy church, and St. John the Baptist. The idea has been obtained from the "Te Deum Laudamus." The three middle lower lights are occupied by the Adoration of the Infant Christ, Virgin and Child being in the centre, and the adoring Magi and shepherds on the right and left respectively. The first (counting from the left), second, sixth, and seventh lower lights in the same division illustrate the Annunciation, the Nativity, the Baptism, and the Transfiguration of Christ, each subject having its Old Testament type below, namely, angels appearing to Abraham, the birth of Isaac, the passage of the Red Sea, and Moses descending the mountain. The upper tracery is filled with cherubim and angels, bearing scrolls, musical instruments, and emblems of the Passion. The work, which has cost over 1,000*l.*, has been executed by Messrs. Clayton & Bell, of Regent-street, London. The stonework has been placed in thorough repair under the direction of Mr. E. I. Hubbard, architect.

**THE EFFINGHAM MEMORIAL WINDOW, WHISTON CHURCH.**—On the 27th ult., a new stained-glass window, being the east window of the south aisle, was unveiled in Whiston Parish Church, in memory of the second Earl of Effingham and Lady Charlotte Howard. The window has been placed there by Mrs. Wm. Howard, widow of the Hon. and Rev. Canon Howard, late rector of Whiston. It is the third largest window in the church; and contains three lights. Christ enthroned in glory is the subject illustrated in the top of the centre light; angels with emblems of the Passion are represented in the upper side-lights; below, in the centre light, are male saints, St. Jerome being conspicuous. Virgin saints are represented on the right, and widow saints on the left side. The work has been carried out by Messrs. Burlison & Grylls.

#### FOREIGN AND COLONIAL.

**FRANCE.**—The Société des Amis des Arts of Versailles has just opened its annual exhibition. This society, founded forty years ago, is one of the most important in the provinces, and the present exhibition (the thirty-seventh) includes about 800 pictures. The curator of the museum at Cherbourg gave notice some time ago of the unaccountable disappearance of a small picture by Clouet, a portrait of a lady. This work, valued at 25,000 francs, has been found at Paris, by a painter, M. Frérot, at a carver and gilder's, in rue Tailbourg,

who had bought it for 40 francs from a stranger. The picture has for the present been deposited at the Direction des Beaux-Arts. It is announced that the municipal museum at Roubaix has been transformed into a national museum, and will become an annexe to an "Ecole Nationale des Arts Industriels" which the State has founded in that town. The new museum will be inaugurated in October. The jury commissioned to examine the competition designs for a Savings Bank to be built at Troyes have unanimously awarded the first premium to M. Henry Schmidt, architect, of Paris. They have not awarded the second premium, but third premiums have been given to MM. Collier (Paris), Mony & Vernot (Troyes), and Guyon (St. Maurice). MM. Mignan, Forest, Bungas, Fauconnier, Mathien, and Pergot have obtained honourable mentions. Some days ago, at a meeting held at the Mairie of Alger, it was unanimously resolved to hold a universal exhibition there. Some curious mural paintings of the seventeenth century have been recently discovered in the church of the Ponce, near Le Mans. According to the *Semaine des Constructeurs*, the Municipal Council of Paris has passed votes for the requisite sums for four new "Casernes des sapeurs-pompiers." The Council has also adopted the conclusions of the report of M. Charles Lament, in favour of mortuary deposits near the principal cemeteries, to relieve the dead of poor families living in small houses, until interment. A small morgue is to be built near the Canal St. Martin, at a cost of not above 3,800 francs. The Council has adopted the "projet de délibération," presented by M. Santon, which invites the administration to examine the utility and the consequences to Paris generally of the projected railways, and the modifications which their construction would necessitate in water and gas service, drainage, &c.

**DURBAN WATERWORKS EXTENSION.**—The Corporation of Durban, Natal, are taking steps to push forward with their new waterworks extension as rapidly as possible. Mr. J. Fletcher, C.E., the local Borough Surveyor of Durban, has drawn out a preliminary scheme for taking a large supply of water from the Umlaas River, in the neighbourhood of Durban. Mr. W. H. Radford, C.E., Nottingham, is the consulting engineer for the scheme, and the scheme was arranged for execution in two sections. The estimated cost of the first section was 65,767*l.*, and of the second section, 54,625*l.*, making a total of 120,392*l.* The intake for the first section will be situate on the Umlaas River, ten miles from Durban. The water will be conveyed several miles down the river in 18-in. iron pipes to the pumping-station, where a portion of the water will be utilised to work turbines which will pump the remainder of the water to a high summit reservoir and filter-beds. From the summit reservoir and filter-beds the water will flow by gravitation through four miles of 15-in. iron pipes, delivering into three local town distributing reservoirs. When the second section is carried out, the 18-in. iron pipes will be carried eight miles farther up the river to a water intake, at a sufficiently high level to supply the town by gravitation. When the scheme is finally completed, the works will deliver 2,000,000 gallons per day. As consulting engineer, Mr. Radford designed all the details of the special castings required, and calculated all the strains and thicknesses to perform the work intended. The greater number of the pipes will be turned and bored, with a keyed space outside for lead or cement. Each casting will be tested at the iron works by hydraulic pressure to 500 and 700 ft. head respectively; for working pressures of 250 to 350 ft. All castings will be heated in stoves and dipped in Dr. Angus Smith's composition at a temperature of 300 deg. Fahr. Tenders were invited by advertisement, and there was a good competition. The Durban Corporation have let the contract to the Staveley Iron Works Co., Erewash Valley, England. The contract amount for the pipes delivered on board at an English port is 16,854*l.* The special castings are to be paid for by schedule of prices. There will be about 5,000 iron pipes in 9 by 12 ft. lengths, and weighing about 3,500 tons. The sizes of the pipes are 16 in., 15 in., 12 in., 8 in., 5 in., 4 in., and 3 in. The pipes are now being made.

**THE STOCKHOLM INDUSTRIAL EXHIBITION.**—Active preparations are in progress for the industrial exhibition to be held in Stockholm in a year or two.

**STATUE OF THE LATE MR. FORSTER.**—On the 1st inst., Viscount Cranbrook, Lord President of the Council, unveiled a statue of the late Right Hon. W. E. Forster, which has been appropriately placed in the Embankment Gardens, immediately opposite the offices of the London School Board. The statue, which is the work of Mr. H. Edward Pomeroy, is in bronze, and represents Mr. Forster standing in an attitude of rest in the interval of a speech. The right arm is bent behind and rests on the top of the hip towards the back; in the left hand is held a book, and the head is erect. The statue is on the scale of most of the other statues on the Thames Embankment, being about 9 ft. high, and the pedestal on which it stands is about a foot less.

#### MISCELLANEOUS.

**THE ADDITIONS TO WESTMINSTER HALL.**—It appears that this in every sense unfortunate structure is already showing signs of decay. In reply to a question asked in the House of Commons on Tuesday night, the information was elicited from the First Commissioner of Works that,—"Some interesting stones which were taken from the old buttresses have been re-used in corresponding positions in the new buttresses, and these, having been covered up in the old buildings for many years, are, now that they are again exposed to the atmosphere, showing signs of decay on the surface, but this, after a time, will probably cease to a great extent. With respect, however, to the new stonework which has been used as a facing to the main wall in the interior of the hall, I regret to say that from some reason which cannot at present be explained certain patches of the work are undoubtedly decaying on the surface, and, strange to say, in the same places as the decay had principally occurred in the old stonework before the repairs were effected. The architect, Mr. Pearson, is quite unable to account for this mysterious decay, and assures me that the stone selected for the work (Ketton) is the best for the London atmosphere, and this opinion would appear to be borne out by its standing well on the outside of the building. It is believed that there must be some peculiarity in the mortar of those parts of the old wall where the decay is taking place." The building seems disposed in various ways to revenge itself on its originators.

**KIRKSTALL ABBEY.**—The *Leeds Mercury* reports that at a meeting of the Sub Corporate Property Committee, Ald. Sir E. Cairns in the chair, a report by Mr. J. T. Micklethwaite, of London, was read as to the progress of the proposed scheme for the restoration of the Abbey, according to the instructions of the committee, and it was decided that with a view to the carrying out of the necessary works of preservation the services of an experienced clerk of works should be obtained, as recommended in the report. A letter was also read from Mr. W. H. St. John Hope, M.A., Assistant Secretary of the Society of Antiquaries, London, in which he states,—"Your excavations at Kirkstall have opened up things of the greatest interest, and by the time you have done Kirkstall will certainly equal Fountains in archaeological interest. When all is done I shall be glad to undertake for the Corporation a proper descriptive history of the abbey."

**FEDERATION OF CARPENTERS AND JOINERS.**—A conference of carpenters and joiners was held on Monday last at the "Hen and Chickens Hotel," Sheffield, for the purpose of forming a federation in connexion with this branch of industry. Representatives attended from Birmingham, Liverpool, Sheffield, Leeds, Hull, Burnley, Bury, and Newport. A scheme was drawn up and agreed upon, whereby in case of disputes any of the federated towns will immediately receive the moral and pecuniary support of the whole federation. In addition to the towns before mentioned, a number of other large towns have already signified their approval of the scheme. Birmingham was fixed as the headquarters of the federation for the coming year.

**CONSTABLE'S SKETCHES.**—The *Portfolio* for August contains an interesting article by the Editor on Constable's sketches, with some facsimile reproductions giving examples of the great landscape painter's manner of rapid sketching in chalk and in brush monochrome. The value of these is as examples of methods of rapidly seizing an effect on the spot.

**A NEW METHOD FOR VENTILATING RAILWAY CARRIAGES,** and preventing dust from entering with the air, is said to have appeared in France. The more quickly the train moves, the more rapidly the apparatus works. The air is made to traverse a receptacle containing water, which cools it and relieves it of dust, after which it goes through another filtering before entering the carriage.

**MEETING OF ROAD SURVEYORS IN DUNDEE.**—The sixth annual general meeting of the Road Surveyors' Association was held in the Royal Hotel, Dundee, on the 31st ult. There was a good attendance, and Mr. W. Rankin, Thornhill, presided. It was arranged that the next meeting should be held in Aberdeen. Mr. Alexander Hogg, Alford, was elected President, and Mr. Thomas Johnston, Hurlst, and Mr. A. B. Smith, Annan, Vice-presidents. Mr. Stevenson, Ayr, was reappointed Secretary. Mr. Hogg, Alford, read a paper on "Roads and Traffic," in which he said the road required for the traffic of the time must be stronger and more consolidated than the road of the old coaching days. It must also be smooth and clean, and to secure this the material must be from the best stone, and consolidated with heavier appliances. A road to stand locomotive or heavy traffic of any sort must be consolidated with a uniform pressure as great or greater than the traffic it has to sustain, and finished with a smooth surface which will not rattle, so as to accommodate the passage of the tender class of vehicles. Ten years ago there were only one or two steam rollers in Scotland; now there are about thirty, and the number is still increasing. In many districts there would not be sufficient work in rolling alone to warrant the outlay, and the way to overcome this difficulty was to combine either steam breaking or haulage, or both.



JULY 31.—By *R. W. Scobell*: f.g.r. of 72L, with reversion in 74 yrs., The Grove, Ealing, 1,805; f.g.r. of 32L, with reversion in 76 yrs. Manly, 750L.—By 4



**Richards:** "The Anchorage," Eillet-lane, Walthamstow, L. r. 381, 360L. "Elm Lodge," L. r. 212, 230L; 23, Kentish Town-rd., Camden-rd., u. 30 yrs., g. 51. 58, r. 461, 305L; 10, Provost-rd., Havestock-hill, u. 53 yrs., g. 54, 450L; By **Weatherall & Green:** 19, Litchfield-rd., Alto Road, u. 61 yrs., g. 1. 18, r. 304, 385L. By **Thompson & Co.:** "Furdon Farm," near Okehampton, Devon, and 535a. 2c. 16p., 3,600L. "Shorridge Farm," near Bedford, 33a. 1c. 13p., L. r. 52, 1,935L. "East Church Farm," 169a. 1c. 1p., L. r. 1,850L. "Little East Church Farm," 17a. 0c. 1p., 1,300L. "Higher Dornford Farm," near Okehampton, 135a. 1c. 3p., L. r. 910L. By **Wood & Kirby:** 19 to 24, Lower Richmond-rd., Romford, u. 80 yrs., g. 231, 601L. By **R. Tiley & Son:** 1 and 11, Thorpe-dale-rd., Holloway, u. 20 yrs., g. 32, r. 681, 365L; 2 and 3, Derby-rd., Kingsland, u. 23 yrs., g. 81, r. 230L. By **Newson & Harding:** 49, Colebrook-rd., Islington, L. r. 876L; 8 to 19, Dunston-rd., Kingsland, u. 23 yrs., g. 30, 3,000L; 19, 21, and 23, Arvon-rd., Highbury, u. 16 yrs., g. 251, r. 120, 945L; 25, 27, and 33, Arvon-rd., u. 95 yrs., g. 252, r. 120, 945L; f.g.r. of 20L with reversion in 90 yrs., Pedro-st., Clapton, 405L; 20, Medina-rd., Holloway, u. 70 yrs., g. 10, 365L; 21, Wilton-st., Hoxton, u. 25 yrs., g. 41, 44, r. 241, 250L. By **E. Stinson:** 249, Brixton-rd., Brixton, u. 62 yrs., g. 104, r. 70L, 690L. "The Wrotham Arms Hotel," Broadstairs, u. 17 yrs., g. 104, r. 301, 800L; 45, Chapel-rd., Norwood, u. 24 yrs., g. 111, r. 311, 45L; 1 to 7, "Rose Cottages," u. 24 yrs., g. 242, 425L; No. 33, Dore-lane and goods, 13, a barrow, Bishopgate-st., Without, 310L; 6, 13, and 14, Lambeth, u. 80 yrs., g. 7, 1, 400L; 5, 6, 13, and 14, Tenison-st., u. 32 yrs., g. 301, r. 180L, 1,470L; 20 and 21, Sutton-st., u. 2 yrs., g. 101, r. 945L; 10, Manner-st., u. 4 yrs., g. 51, r. 201, 401L. By **Debenham, Tesson & Co.:** the residence called "Chambers," Hampton, L. r. 250L; f.g.r. of 40L with reversion in 90 yrs., Avenue-rd., Chesham, 900L; f.g.r. of 12L 12s. with reversion in 16 yrs., 320L. By **Herman Bros.:** 71, 73, and 77, Tyrwhitt-rd., Lewisham, u. 82 yrs., g. 252, 4s. r. 1,651, 1,650L; 10, Scarborough-rd., Holloway, u. 88 yrs., g. 7, 1, r. 381, 375L; 74, Upper Tollymore-pk., u. 88 yrs., g. 101, r. 601, 600L. By **Worsfold & Haywood** (at Dover): 19, Beach-st., 7, 5, and 10, Middle-row, 16, Seven Star-st., 5 to 8, Funchill, and 3, Clarendon, u. 21 yrs., 1,470L; nine leasehold houses in Oxendon-st., Lime Kiln-st., Bulwark-lane, Oxendon-lane, Paradise-st., and Round Tower-lane, 462L; f. cottage and 2 acres River, near Dover, 430L.

**August 1.**—By **H. Newson:** i.g.r. of 62L, u. 16 yrs., g. 151, Euston-rd., 405L; i.g.r. of 70L 8s., u. 16 yrs., g. 101, Mable-rd., Burton-cree, 400L. By **Topple & Harding:** 1 to 25 (old), Newman-st., Battersea, u. 56 yrs., g. 601, 1,400L; 39, Braman-rd., Brixton, u. 35 yrs., g. 51, 58, r. 301, 300L. By **J. H. Bethel:** f. land, 4, 1, Barking-rd., West Ham, 1,350L; f. land, 1a. 3r. 35p., Regent-lane, Custom-house, 1,100L. By **A. Williams:** enclosures of f. land, 78a. 0c. 21p., Binsted, Hants, 2,885L; enclosures of meadow-land, 11a. 3r. 3p., L. r. 360L.

(Contractions used in these lists.—F.g.r. for freehold ground-rent; i.g.r. for leasehold ground-rent; g.r. for improved ground-rent; g.p. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u. for unexpired term; p. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.)

## PRICES CURRENT OF MATERIALS.

TIMBER.	£.	s.	d.	£.	s.	d.
Greenheart, B.G. ....	ton	6	10	0	7	10
Teak, E.I. ....	ton	11	0	0	14	0
Sequoia, U.S. ....	foot cube	0	2	0	8	0
Ash, Canada, ....	ton	8	0	0	10	0
Birch, ....	ton	8	0	0	5	0
Elm, ....	ton	3	10	0	4	16
Fir, Dantsic, &c. ....	ton	2	10	0	2	10
Oak, ....	ton	2	10	0	10	0
Canada, ....	ton	5	10	0	6	10
Pine, Canada red, ....	ton	2	10	0	8	10
Yellow, ....	ton	2	0	0	0	0
Lath, Dantsic, ....	fathom	6	0	0	6	0
St. Petersburg, ....	ton	6	0	0	7	0
Wainscot, Riga, &c. ....	log	0	0	0	0	0
Deal, Finland, 2nd and 1st std. 100 .....	ton	7	15	0	10	0
" 4th and 3rd .....	ton	7	0	0	7	10
Riga .....	ton	9	10	0	14	10
St. Petersburg, 1st yellow .....	ton	9	10	0	14	10
" 2nd .....	ton	7	10	0	9	0
" white .....	ton	7	0	0	10	0
Swedish .....	ton	7	0	0	16	0
White Sea .....	ton	8	0	0	17	0
Canada, Pine, 1st .....	ton	15	0	0	26	0
" 2nd .....	ton	10	0	0	16	10
" 3rd .....	ton	7	0	0	10	0
" Spruce, 1st .....	ton	8	15	0	11	0
" 3rd and 2nd .....	ton	6	10	0	8	10
New Brunswick, &c. ....	ton	8	0	0	8	0
Battens, all kinds .....	ton	0	0	0	10	0
Flooring Boards, sq. 1 in. prepared, first .....	ton	0	10	0	0	14
Second .....	ton	0	0	0	0	10
Other qualities .....	ton	0	0	0	0	7
Cedar, Cuba .....	foot	0	0	4	0	42
Honduras, &c. ....	foot	0	0	4	0	42
Mahogany, Cuba, &c. ....	foot	0	0	4	0	42
St. Domingo, cargo average ..	ton	0	5	0	0	61
Mexican .....	ton	0	0	4	0	61
Tobacco .....	ton	0	0	0	0	61
Honduras .....	ton	0	0	0	0	61
Box, Turkey .....	ton	5	0	0	13	0
Rose, Rio .....	ton	14	0	0	19	0
Bahia .....	ton	12	0	0	13	0
Satin, St. Domingo .....	foot	0	0	4	0	18
Porto Rico .....	foot	0	0	0	1	8
Walnut, Italian .....	ton	0	0	4	0	7

## METALS.

IRON—Bar, Welsh, in London tin at works in Wales	6	10	0	6	17	6
" Staffordshire, in London	6	0	0	6	10	0
COPPER—British, cake and ingot	62	0	0	62	10	0
Best selected	64	10	0	65	0	0
Sheets, strong	71	0	0	0	0	0
Chili, bars	67	10	0	0	0	0
YELLOW METAL	lb.	0	0	61	0	0
LEAD—Pig, Spanish	ton	12	17	6	13	0

METALS (continued).	£.	s.	d.	£.	s.	d.
English, com. brands	13	0	0	0	0	0
Sheet, English, 3 lbs. per square foot and upwards	15	0	0	0	0	0
Pipe	16	10	0	0	0	0
TIN—						
Straits	94	10	0	0	0	0
Anstralia	94	15	0	0	0	0
English Ingots	98	0	0	0	0	0
OILS.						
Linseed	23	17	6	24	5	0
Cocoonut, Cochín	33	0	0	0	0	0
Cocoonut, Ceylon	28	15	0	0	0	0
Palm, Lagos	22	0	0	26	10	0
Rapeseed, English pale	30	0	0	30	5	0
" brown	28	10	0	0	0	0
Cottonseed, refined	21	5	0	0	0	0
Tallow and Oleine	21	0	0	40	0	0
Lubricating, U.S.	5	10	0	8	0	0
" refined	7	0	0	12	0	0
TAR						
Stockholm	0	15	0	0	0	0
Archangel	0	14	0	0	0	0

## TENDERS.

[Communications for insertion under this heading must reach us not later than 12 noon on Thursdays.]

**ASHTON-UNDER-LYNE.**—For the erection of a Methodist New Connexion Mission School. Mr. J. H. Burton, architect, Ashton-under-Lyne:—  
R. Whittell, Manchester ..... £1,440 0 0  
Garfield, Barnes & Co., Stalybridge ..... 1,374 10 0  
Jos. Davidson, Manchester ..... 1,370 0 0  
Jos. Taylor, Dukinfield ..... 1,341 0 0  
Allen Holmes, Ashton-under-Lyne ..... 1,340 0 0  
Jabez Gibson & Son, Dukinfield ..... 1,309 0 0  
J. W. Williamson, Ashton-under-Lyne ..... 1,276 0 0  
Filton & Bownes, Ashton-under-Lyne ..... 1,250 0 0  
Underwood & Bros., Dukinfield ..... 1,244 12 6  
Henry Gardner, Ashton-under-Lyne ..... 1,230 0 0  
Rob. Robinson ..... 1,223 0 0  
\*Accepted subject to certain alterations.

**BOSTON (Lincolnshire).**—For erecting two pairs of semi-detached villas, residence, for Mr. Barwick. Mr. Jas. Rowell, architect, Boston:—  
Bricklayers, Masons, Slaters, and Plasterers' Work.  
J. Handley ..... £870 0 0  
W. Greenfield ..... 819 0 0  
H. W. Parker (accepted) ..... 890 0 0  
Carpenter's Work.

W. & H. Hinds ..... £470 0 0  
C. Jessop ..... 455 0 0  
J. Lense ..... 410 0 0  
Hill & Sons (accepted) ..... 310 0 0  
[All of Boston.]

**BRENTFORD.**—For erecting fire-escape protection, &c. at "The Cages" for the Brentford Local Board. Mr. J. H. Strachan, Surveyor:—  
W. F. Wickenden, Brentford ..... £137 16 8  
Jas. Barnes, Brentford ..... 120 0 0  
W. Barrett, Brentford ..... 118 8 0  
Surveyor's estimates ..... 119 10 0  
\*Accepted.

**CINDERFORD (Gloucestershire).**—For draining and making-up streets at Flaxley Meuse, Cinderford, for the Westbury-on-Severn Union Rural Sanitary Authority. Mr. Wm. Spence, Surveyor, Cinderford, Newham:—  
Sanitary and Economic Association, Limited, Gloucester ..... £2,304 10 7  
J. Coleman, Chaxhill ..... 1,777 0 0  
Jas. Dickson, St. Albans ..... 1,470 0 0  
S. Ambrose, Bath ..... 860 0 0  
L. Wilce, Cinderford (accepted) ..... 1,850 0 0

**CROYDON.**—For works at Bramley Hill-side, South Croydon, for Mr. T. Pickett:—  
T. Poltorakov (accepted) ..... £772 0 0  
[No competition.]

**DURHAM.**—For re-building property in North-road, Durham, for Mr. J. L. Wharton, M.P. Mr. Wm. Fox, architect, Durham:—  
Gradon & Son ..... £700 0 0  
Walton & Co. (accepted) ..... 687 0 0  
Mowbray Brothers (accepted) ..... 643 0 0  
Gibson ..... 642 0 0  
[All of Durham.]

**EGHAM.**—For additions to schools, Egham, for the Trustees of the Schools. Mr. A. G. Hutchin, Clerk to the Trustees:—  
S. Collar, Ashford ..... £276 0 0  
C. Searle, Egham ..... 219 0 0  
C. Oades, Egham (accepted) ..... 215 0 0

**GATESHEAD.**—For sewer, paving, cement, &c., Claremont South-avenue, Gateshead, for the Gateshead Corporation. Mr. J. Bower, C.E., Borough Surveyor, Town Hall, Gateshead:—

**Paving.**  
G. Smith, Newcastle ..... £212 0 0  
W. Lawton, Tyne-mouth ..... 211 0 0  
J. T. Simpson, Newcastle ..... 201 0 0  
G. Maughan, Jarrow ..... 188 0 0  
J. Wardlaw, Gateshead (accepted) ..... 181 0 0  
W. Cumming, Gateshead (accepted) ..... 175 0 0

**Cementing.**  
T. Rule, jun., Gateshead (accepted) ..... 82 0 0

**GREAT DUNMOW (Essex).**—For alterations to County Police-station, Great Dunmow, for the Standing Joint Committee of the Essex Court of Quarter Sessions and the Essex County Council. Mr. Henry Stock, County Surveyor, 9, Denman-street, London Bridge, S.E.:—  
A. Ansell, Hatfield, Broad Oak ..... £239 0 0  
H. Chappell, Bishop Stortford ..... 620 0 0  
J. Pepper, Dunmow (accepted) ..... 590 0 0

**GLoucester.**—For additions and alterations to Police-court, Lawford Gate, Gloucester. Mr. Robt. Phillips, County Surveyor, Shirehall, Gloucester:—  
G. Humphreys, Stapleton-road ..... £286 0 0  
C. J. King, Retton ..... 245 0 0  
Edwin Clark, Fishponds (accepted) ..... 240 0 0

**GUERNSEY.**—For erecting new premises, including arrangements for water supply, for the Capital and Counties Bank, Limited. Messrs. Kidner & Berry, architects, 23, Old Broad-street, London, E.C.:—  
E. A. de Putron, Guernsey ..... £5,159 12 3  
G. F. Peck, Guernsey ..... 4,572 0 0  
Woodford & Harris, Jersey ..... 4,649 0 0  
\*Accepted.

**HASTINGS.**—For lining and covering two reservoirs, and alterations to two filter-beds, &c., at the water-works, Hailton, Hastings, for the Hastings Corporation. Mr. P. H. Palmer, Engineer, Town Hall, Hastings:—  
P. Jenkins, Hastings (accepted) ..... £2,549 0 0

**HINCKLEY.**—For the supply of granite road-metal at Hinckley, for the Hinckley Local Board. Mr. W. W. Cooper, Surveyor, Public Offices, Hinckley:—  
delivered on the spot.  
Mount Sorrel Granite Co., Ltd., 6 broken granite, Loughborough ..... 3 broken chippings.  
delivered on roads.  
Enderby & Stoney Stanton 6 broken granite, Granite Co., Narnborough ..... 8 broken chippings.  
\*Accepted.

**KINGSWINFORD.**—For building class-room to Board School, Kingwinford, Staffordshire. Messrs. Hollinson & Beadley, architects, High-street, Brierley Hill:—  
Saml. Cook, Brierley Hill ..... £269 0 0  
Hemmingway & Whittaker, Brierley Hill ..... 330 0 0  
R. E. W. Patinson ..... 285 5 11 1/2  
John Bishop, Brierley Hill (accepted) ..... 282 17 0

**LONDON.**—For iron staircase as a fire precaution to the children's block at the Gordon-road, Workhouse, Peckham, for the Camberwell Board of Guardians. Mr. R. P. Whellock, architect, 46, Finsbury-pavement, E.C.:—

G. Smith & Co., Sun Foundry, Glasgow ..... £270 0 0  
Young & Co., Eccleston Iron Works, S.W. .... 220 0 0  
Radham & Co., Featherstone Buildings, W.C. .... 176 0 0  
Clarke & Sons, Moorgate-street, E.C. .... 169 0 0  
Robt. Crane, Binfield-road, Clapham, S.W. .... 160 0 0  
Constructional Ironwork Co., Race-road, Bow, E. (accepted) ..... 149 10 0  
Wheeler & Co., Crescent Works, Nunhead, S.E. .... 95 10 0  
Stevens Bros., Upper Thames-street, E.C. (informal) ..... 82 5 0  
St. Pancras Ironwork Co., London (informal) ..... 78 0 0  
[Architect's approximate estimate, £150.]

**LONDON.**—For the erection of a double cookery centre on the Haslegrave-road Site, Clapham, and for providing an entrance for the Boys' Department in Kenyon-road, for the School Board for London. Mr. T. J. Bailey, Architect:—

If brickwork in cement—add  
J. Mowlem & Co., £1,373 0 0 ..... £234 0 0  
Staines & Son ..... 1,164 0 0 ..... 23 0 0  
Dove Bros. .... 1,145 0 0 ..... 28 0 0  
R. W. Patinson ..... 1,157 0 0 ..... 30 0 0  
Kilby & Gayford ..... 1,129 0 0 ..... 30 0 0  
E. Lawrence & Son ..... 1,108 0 0 ..... 28 0 0  
G. S. Williams & Son ..... 1,105 0 0 ..... 25 0 0  
B. E. Nightingale ..... 1,063 0 0 ..... 23 0 0  
\*Recommended by the Works Committee for acceptance.

**LONDON.**—For the erection of a school to provide accommodation for 1,000 children, on the site in Ivydale-road, Nunhead, and for the erection of a school-keeper's house, with a technical class-room underneath, for the School Board for London. Mr. T. J. Bailey, Architect:—

If brickwork in cement—add  
W. Goodman ..... £23,659 0 0 ..... £520 0 0  
Colls & Son ..... 23,671 0 0 ..... 490 0 0  
Dove Bros. .... 22,993 0 0 ..... 493 0 0  
Kilby & Gayford ..... 22,454 0 0 ..... 498 0 0  
E. Lawrence & Sons ..... 22,064 0 0 ..... 498 0 0  
B. E. Nightingale ..... 20,327 0 0 ..... 537 0 0  
\*Recommended by the Works Committee for acceptance.

Withdrawn on account of error in estimate.

**LONDON.**—For the erection of a school to provide accommodation for 1,000 children, on the site in Church-street, Stoke Newington, and for the erection of a school-keeper's house, with a single cookery centre underneath, for the School Board for London. Mr. T. J. Bailey, Architect:—

If brickwork in cement—add  
W. Goodman ..... £23,556 0 0 ..... £290 0 0  
Dove Brothers ..... 23,410 0 0 ..... 370 0 0  
G. S. Williams & Son ..... 23,484 0 0 ..... 372 0 0  
Kilby & Gayford ..... 22,330 0 0 ..... 355 0 0  
R. W. Patinson ..... 22,286 0 0 ..... 356 0 0  
Charles Cox ..... 21,645 0 0 ..... 352 0 0  
\*Recommended by the Works Committee for acceptance.



COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Prize.	Designs to be delivered.
Swimming Bath	Hackney Union	Not stated	Aug. 15
Municipal Lodging House	London, C.C.	1000	Nov. 15

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Sewering Roads, Dartford.	Kent & Essex Land Co. Limited	G. R. Cobham	Aug. 21
New Quay in Inner Harbour.	Stornoway Pier, & Commission	Alex. Macdonald, C.E.	Sept. 1
Tenements	Magistrates & Council of Glasgow	do.	do.
Alterations to Workhouse.	Newcastle upon Tyne Guardians	W. H. Dunn	Aug. 22
*Erection of Board School	Reading School Board	S. S. Stallwood	Aug. 25
*Brick and Pipe Sewers, &c.	Essex Local Board	do.	Sept. 1
*Supplying Gravel	Croydon Corporation	W. Powell	Sept. 9
Excavations and Building a Culvert	Elgerton (Harrowshire) Highway Bd.	Official	No date
Business Premises, Hartford.	Brookfield & Windows	Geo. Wormald	do.
Alterations, &c. to Inn, Stafford	J. E. & H. S. Bunby	do.	do.
25 Cottages, Naudy Rhonda Fach	Rev. D. E. Key	Wm. Thomas	do.
Alterations, &c. to Church, Glasgow	do.	do.	do.
Works, Birmingham Church, ar. Barnard	do.	do.	do.
Sinking a Shaft, 60 fathoms	Edwicks (Newcastle) Coal Co.	J. P. Pritchett	do.

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Paving Sets, Iron Castings, Earthenware Pipes, &c.	Dewsbury Corporation	Henry Marks	Aug. 11
Pipe Sewers, &c.	East Ham Local Board	W. H. Sayce	Aug. 12
Read Road, Bridge, &c.	Carlton (Nottingham)	do.	do.
Hospital Ward	Local Board	R. Whitbread	do.
Dwelling-house, Carlisle, &c.	Cardiff Corporation	W. Hapton	Aug. 13
Works at Rathach Church, Dublin	Rev. J. Fulham	Wm. H. Byrne	Aug. 14
Alterations to Public School, Egha, N.B.	A. W. Reid	Wilson, Son, & Co.	Aug. 15
Boundary Wall, Drainage, &c.	St. George-in-the-East	Wickie	do.
New Police Station, Merton, Durham	Standing Joint Com.	Wm. Crozier, C.E.	Aug. 16
New Sewers and Outfall Works	Workington U.S.A.	Wm. H. Eaglesfield	do.
Read Road, Bridge, and Paving	East Ham Local Board	do.	do.
Cast-iron Pipes (270 tons), &c.	Stansfeld (Halsbury)	G. & G. H. Crowther	do.
Supply of Building Materials, Canterbury	Local Board	Official	do.
New Entrance Gates, &c.	Ledsa Corporation	Mr. Smith	Aug. 18
Condition for Refuse Destructor	Southborough Corp.	do.	do.
Schools, Kinson Village	Adm'd. (Wm. Bates)	do.	do.
additions, &c. to Guildhall, Plymouth	School Board	Lawson & Dunkin	do.
Drainage Works, Fitting, &c.	Brackley Guardians	H. & J. Ojler	do.
Condition for Refuse Destructor	Bath F.S.A.	Official	Aug. 19
few Schools	Covey City School Bd.	G. A. J. Stearns	Aug. 21

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Clerk of Works	Willesden Local Board	4 Guineas	Aug. 12
*Drainage (Engineering)	Wallall Corporation	do.	Aug. 18
*Clerk and Draughtsman (Surveying)	Civil Service Commrs.	Not stated	Aug. 26
Superintendent of Interception Dept.	do.	do.	Aug. 29
Barnham Corp.	do.	3500	Aug. 29

Those marked with an Asterisk (\*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. and vi. Public Appointments, xviii.

LONDON.—For removing the two iron buildings at present on the Halford-road site, Walham-green, and to one iron building from the Langford-road site, Uham, and for re-erecting them on the Little-road site, North End-road, Fulham, for the School Board for London. Mr. T. J. Bailey, Architect:—  
J. Humphreys ..... £700 0 0  
Norris & Luke ..... 645 0 0  
Covey & Drayton ..... 707 0 0  
J. Derry ..... 580 0 0  
G. H. Sealy ..... 525 0 0  
P. Cruwys ..... 450 0 0  
Cragdon & Co. .... 445 0 0  
Simmonds Bros. .... 425 0 0  
J. J. Richards \* ..... 360 0 0

Recommended by the Works Committee for acceptance.

LONDON.—For erecting a single cookery centre on the Inner-road site, North Hill, for the School Board for London. Mr. T. J. Bailey, Architect:—  
If brickwork in cement, add  
W. Mowlem & Co. .... £719 0 0  
J. Goodman ..... 707 0 0  
Kilby & Gayford ..... 675 0 0  
Dove Bros. .... 661 0 0  
Staines & Son ..... 649 0 0  
E. Lawrence & Sons ..... 649 0 0  
G. S. S. Williams & Son ..... 633 0 0  
S. & W. Pattinson ..... 621 0 0  
B. E. Nightingale ..... 598 0 0

Recommended by the Works Committee for acceptance.

LONDON.—For erecting a single cookery centre on the Sydney-road site, Hornetown, for the School Board for London. Mr. T. J. Bailey, Architect:—  
If brickwork in cement, add  
W. Mowlem & Co. .... £746 0 0  
Kilby & Gayford ..... 725 0 0  
J. Goodman & Co. .... 715 0 0  
Dove Bros. .... 713 0 0  
E. Lawrence & Sons ..... 699 0 0  
Staines & Son ..... 685 0 0  
Chas. Cox ..... 683 0 0  
G. S. S. Williams & Son ..... 673 0 0  
B. E. Nightingale ..... 660 0 0  
S. & W. Pattinson ..... 659 0 0

Recommended by the Works Committee for acceptance.

LONDON.—For the erection of a single cookery centre on the Hackford-road site, Brixton, for the School Board for London. Mr. T. J. Bailey, Architect:—  
If brickwork in cement, add  
J. Mowlem & Co. .... £743 0 0  
J. Goodman ..... 739 0 0  
Kilby & Gayford ..... 709 0 0  
Dove Bros. .... 688 0 0  
E. Lawrence & Sons ..... 679 0 0  
Staines & Son ..... 661 0 0  
Staines & Son ..... 659 0 0  
S. & W. Pattinson ..... 650 0 0  
B. E. Nightingale ..... 610 0 0

Recommended by the Works Committee for acceptance.

LONDON.—For erecting a single cookery centre on the Cobourgh-road site, Old Kent-road, for the School Board for London. Mr. T. J. Bailey, Architect:—  
If brickwork in cement, add  
J. Mowlem & Co. .... £806 0 0  
Kilby & Gayford ..... 754 0 0  
J. Goodman ..... 730 0 0  
Dove Bros. .... 707 0 0  
Staines & Son ..... 696 0 0  
G. S. S. Williams & Son ..... 684 0 0  
Staines & Son ..... 684 0 0  
S. & W. Pattinson ..... 685 0 0  
B. E. Nightingale ..... 640 0 0

Recommended by the Works Committee for acceptance.

LONDON.—For the enlargement of the Purrett-road school, Plumstead, by 200 places, for the School Board for London. Mr. T. J. Bailey, Architect:—  
If brickwork in cement, add  
W. L. Kellaway ..... £1,705 0 0  
W. Downs ..... 1,618 0 0  
Holloway Bros. .... 1,615 0 0  
Dove Bros. .... 1,614 0 0  
Lathey Bros. .... 1,608 0 0  
J. Grover & Son ..... 1,602 0 0  
Kilby & Gayford ..... 1,592 0 0  
J. Mowlem & Co. .... 1,557 0 0  
B. E. Nightingale ..... 1,531 0 0  
W. H. Lorden & Son ..... 1,336 0 0

Recommended by the Works Committee for acceptance.

LONDON.—For the erection of Divisional Offices on the site at the corner of Greenwich-road and Blackheath-road, for the School Board for London. Mr. T. J. Bailey, Architect:—  
If brickwork in cement, add  
Kilby & Gayford ..... £2,085 0 0  
J. Derry ..... 2,084 0 0  
Lathey Bros. .... 2,046 0 0  
W. Downs ..... 2,038 0 0  
J. Mowlem & Co. .... 2,007 0 0  
B. E. Nightingale ..... 2,030 0 0  
W. H. Lorden & Son ..... 2,025 0 0

Recommended by the Works Committee for acceptance.

LONDON.—For the enlargement of the Poocock-street School, Blackfriars-road, by 400 places, and for reconstructing a portion of the drainage, for the School Board for London. Mr. T. J. Bailey, Architect:—  
If brickwork in cement, add  
J. Mowlem & Co. .... £4,514 0 0  
S. & W. Pattinson ..... 4,021 0 0  
Chas. Cox ..... 3,920 0 0  
J. Tyerman ..... 3,893 0 0  
Wm. Downs ..... 3,829 0 0  
Holloway Bros. .... 3,697 0 0  
E. Lawrence & Sons ..... 3,693 0 0  
B. E. Nightingale ..... 3,520 0 0

Recommended by the Works Committee for acceptance.

LONDON.—For providing a new heating apparatus on the low pressure hot-water system for the new portion of St. Andrew's-street School, Wandsworth-road, which is now in course of erection, and also for providing a new boiler, for the School Board for London. Mr. T. J. Bailey, Architect:—  
J. Grundy ..... £314 0 0  
J. & F. May ..... 565 0 0  
Wontner, Smith, Gray, & Co. .... 559 0 0  
W. G. Cannon ..... 530 0 0  
T. Potter & Sons ..... 530 0 0  
Purcell & Nobbs ..... 486 10 0  
Conyn, Ching, & Co. .... 428 10 0  
Green & Son, Limited ..... 380 0 0

Recommended by the Works Committee for acceptance.

LONDON.—For alterations at the "Hand and Crown," 93, New Oxford-street, for Mrs. Ward. Mr. G. E. Niblett, architect and surveyor, Hackney, E.:—  
Burman & Sons ..... £1,615 0 0  
Spencer & Co. .... 1,550 0 0  
Todd ..... 1,160 0 0  
J. Conway (accepted) ..... 1,050 0 0

Recommended by the Works Committee for acceptance.

LONDON.—For erecting a single cookery centre on the Burchley-road site, Highgate-road, and for providing an entrance to the cookery centre, for the School Board for London. Mr. T. J. Bailey, Architect:—  
If brickwork in cement, add  
J. Mowlem & Co. .... £865 0 0  
Kilby & Gayford ..... 774 0 0  
Dove Brothers ..... 763 0 0  
W. Goodman ..... 764 0 0  
E. Lawrence & Sons ..... 749 0 0  
B. E. Nightingale ..... 734 0 0  
Staines & Son ..... 714 0 0  
S. & W. Pattinson ..... 711 0 0  
G. S. S. Williams & Son ..... 661 0 0

Recommended by the Works Committee for acceptance.

LONDON.—For repairing Beaufoy's schools, Lambeth, S.E. Messrs. Waring & Nicholson, architects, 55, Parliament-street, Westminster, S.W.:—  
W. B. Bryant ..... £895 0 0  
Higgs & Hill ..... 814 0 0  
Thos. Lott ..... 789 0 0  
B. E. Nightingale ..... 758 0 0  
J. Marland ..... 746 0 0  
Wm. Smith ..... 696 0 0  
J. F. Ford ..... 681 0 0  
Hy. Hall ..... 597 0 0

Recommended by the Works Committee for acceptance.

LONDON.—For road-making and paving works at Hammersmith, for the Hammersmith Vestry. Mr. H. Mair Surveyor, Vestry Hall, Broadway, Hammersmith, W.:—  
Craven Cottages.  
Tomes & Wimpey ..... £791 0 0  
E. Rogers & Co. .... 772 0 0  
Nowell & Robson, Warwick-road, Kensington\* ..... 754 0 0  
Hofland-road.  
E. Rogers & Co. .... 310 0 0  
Tomes & Wimpey ..... 301 0 0  
Nowell & Robson, Kensington\* ..... 287 0 0  
Hughenden-road.  
Nowell & Robson ..... 324 0 0  
E. Rogers & Co. .... 320 0 0  
Tomes & Wimpey, Hammersmith\* ..... 309 0 0  
Berestede-road.  
E. Rogers & Co. .... 305 0 0  
Nowell & Robson ..... 314 0 0  
Tomes & Wimpey, Hammersmith\* ..... 290 0 0  
Hebron-road.  
Tomes & Wimpey ..... 355 0 0  
E. Rogers & Co. .... 348 0 0  
Nowell & Robson, Kensington\* ..... 339 0 0

Accepted.

Barb Mews.  
John Williams, Hammersmith\* ..... 480 0 0  
\* Accepted.

LONDON.—For the formation of new road and sewer at Fulham Palace-road, Fulham, for Mr. H. George Smalman. Messrs. F. & W. Stocker, surveyors, 90 and 91, Queen-street, Cheshire, E.C.:—  
A. Boon ..... £707 0 0  
Kellett (too late) ..... 755 0 0  
Nowell & Robson ..... 749 0 0  
A. T. Giffey ..... 648 0 0  
Serf, Haile, & Co. .... 593 0 0  
Killingback ..... 585 0 0  
J. Bowles ..... 554 10 0  
Warner & Co. .... 569 0 0  
Mears ..... 540 0 0  
Tomes & Wimpey ..... 492 0 0  
W. Neave & Son, Paddington\* ..... 467 0 0  
S. Saunders ..... 403 0 0  
Rowland Bros. .... 427 0 0  
W. H. Wheeler ..... 367 0 0

Accepted.

LONDON.—For laying 5,000 yards yellow deal wood paving in the Balaam-road, Tooting, for the Wandsworth Board of Works:—

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a. d.	
Acme Wood Flooring Co. ....	10 6
Brunswick Rock Asphalt Paving Co. ....	9 8
Turner & Son. ....	9 6
Improved Wood Pavement Co., Queen Victoria-street (accepted). ....	8 9

LONDON.—For alterations at the "Crown and Sceptre," Brompton-road, S.W., for Mrs. Hollyman. Mr. G. E. Niblett, architect and surveyor, Hackney:—

W. and L. Ransom. ....	£1,200 0 0
Spencer & Co. ....	1,080 0 0
Todd. ....	1,017 0 0
Burman & Sons. ....	1,007 0 0

LONDON.—For alterations, &c., to the "Jolly Miller" tavern, Millbank-street, Westminster, S.W., for Mr. Edward Dickinson. Mr. H. J. Newton, architect, 49, Victoria-street, Westminster, S.W.:—

J. Tyerman, Walworth. ....	£243 0 0
H. Burman & Sons, Kennington-park* 333 0 0	

\* Accepted.

NEWCASTLE-ON-TYNE.—For extending premises at Pudding Churn, Newcastle-on-Tyne, for Mr. John C. Maundlin. Messrs. Plummer & Burrell, architects, Newcastle-on-Tyne:—

J. & W. Lawry, Newcastle-on-Tyne £312 0 0	
J. W. Wakinslaw, Gateshead. ....	248 0 5
James Horn, Heaton, Newcastle. ....	247 19 11
Anderson & Slater, Newcastle. ....	232 1 4
Middlemiss Bros., Newcastle. ....	225 10 0
Thos. Weatherill, Newcastle* 216 0 0	

\* Accepted subject to certain variations.

PAIGNTON (South Devon).—For the erection of new business premises, 13, Victoria-street, for Mr. Felix Haarer. Mr. Frank E. Haarer, architect, 18, Consort-terrace, St. John's-road, Leeds. Quantities by architect:—

E. Westlake, Paignton. ....	£705 0 0
W. A. Goss, Torquay. ....	740 0 0
Rabbich & Brown, Paignton* 732 0 0	

\* Accepted.

PRESTON.—For building warehouse, with galvanised-iron roof, at Preston, for the Steamship Company. Messrs. Garlick & Sykes, engineers, 33, Winckley-square, Preston:—

Wm. Clegg, Accrington. ....	£1,260 3 2
John Wainman, Preston. ....	1,098 0 0
Albany & Sons, Preston. ....	1,080 0 0
Isaac Dixon & Co., Liverpool. ....	1,055 0 0
Wm. Hotherhall, Preston. ....	990 0 0
T. Livesey, Ashton-on-Ribble. ....	986 17 9
John Christian, Preston (accepted) 951 0 0	

STOWMARKET.—For erecting new billiard room at "The Hill," Stowmarket, for Mr. A. H. Harrison. Mr. H. A. Alexander, architect, 72, Cannon-street, E.C.:—

Gooding, Stowmarket (accepted). ....	£427 12 0
--------------------------------------	-----------

TRURO.—Accepted for the erection and completion of a new shop and warehouse in King-street, Truro, for Mr. Edward Burton. Mr. Silvanus Treval, architect, Truro:—

M. & J. Clemens (masonry). ....	£1,450 0 0
W. J. Tippet (carpentry). ....	

[All of Truro.]

WALTHAMSTOW.—For erecting and completing a new school for boys, girls, and infants, on the site in Markhouse-road, Walthamstow, for the Walthamstow School Board. Mr. W. A. Longmore, architect, 7, Great Albion-street, E. Quantities by Messrs. J. & E. Goodchild, Finsbury-pavement, E.C.:—

Wallis. ....	£13,934 0 0
Watling. ....	13,388 0 0
Little. ....	12,979 0 0
Good. ....	11,576 0 0
Ward & Co. ....	11,440 0 0
Reed. ....	11,370 0 0
Dupont & Co. ....	11,139 0 0
Reed, Blight, & Co., Ltd. ....	10,962 0 0
Scott. ....	10,850 0 0
White. ....	10,556 0 0
E. E. Evans, Peckham, S.E.* 10,595 0 0	
Tags (withdrawn). ....	9,936 0 0

\* Accepted.

TIPTON.—For constructing a brick gas-holder tank at Tipton, for the Tipton Local Board. Mr. Vincent Hughes, Engineer:—

Holmes & King, Liverpool. ....	£3,000 0 0
E. T. Toppel, Leicester. ....	2,975 0 0
Geo. Law, Kidderminster. ....	2,957 0 0
H. Hughes & Son, Lower Gornal, near Dudley. ....	2,490 0 0
Thos. Vale, Stourport. ....	2,325 0 0
James Evans, Abbotford, London* 2,187 0 0	

\* Accepted.

WALTHAMSTOW.—For building new shop and premises, Walthamstow, for Mr. W. Horley. Mr. W. A. Longmore, architect, 7, Great Albion-street, White-chapel, E.:—

S. J. Scott. ....	£1,067 0 0
E. Fuller. ....	961 0 0
J. A. Reed. ....	929 0 0
Walling (accepted). ....	785 0 0
Baker. ....	769 0 0

[All of Walthamstow.]

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# The Builder.

VOL. LIX. No. 2450.

SATURDAY, AUG. 16, 1890.

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Church of St. John-the-Baptist, Burford, Oxon: Plan, and View showing South Porch, Spire, &c. ....	Single-Page Photo-Litho.
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### Around Oxford.



N a neighbourhood such as that surrounding Oxford, an excursion, limited in time as that of the Architectural Association is, has necessarily to be planned to give those taking part in it as good an idea of and insight into the architecture of the district as possible. In former years the mistake of including too many places in the programme has been somewhat apparent, and this year it is satisfactory to find that the list is shorter, and care seems to have been taken to choose places typical of the district, rather than to include everything that is worth seeing. Even as it is, there is a goodly list—upwards of ten churches, exclusive of the manor-houses and the two days devoted to the University itself. The only point, however, which we should like to criticise, was the inclusion of Burford and Minster Lovell in one day. Burford is essentially a place where a day should be spent,—and a long one,—and undoubtedly it would have been much better to have included Minster Lovell in the same day as Cogges.

Burford is not only interesting in itself, but also architecturally it forms a kind of connecting link between Oxfordshire and Gloucestershire. The Archeological Institute is visiting just now some of the notable Gloucestershire centres, and amongst them Cirencester and Northleach, both having many points in common with their Oxfordshire neighbours. As in the West (by which

we more particularly mean Somersetshire and Devonshire), the fifteenth century was a great era for the enlargement of the parish church, and in those buildings which the Association and Institute have been visiting, the century has stamped itself very clearly on the ecclesiastical work. To it we owe the extensive work in the western portion of Burford, and the grand churches of Northleach, Cirencester, and Fairford. The smaller churches, such as Kidlington, Stanton Harcourt, and Cogges have retained more of their earlier work. In their case probably the absence of a rich donor is the cause of their remaining much as they were in the thirteenth and fourteenth centuries, and highly interesting they are to compare with the larger buildings that have undergone the change. Even at Witney, which, compared with some of the other churches of its size, has been altered in a less degree, we find that clearstories have been added to transepts and nave, and the inevitable side chapel, which seems, in this part of the world, to have been expressly designed to swamp the porch, which, again, in one or two cases, has, in its turn, retaliated by growing up into a miniature tower, and not only looking down on the chapel, but contemplating a rivalry with the central tower itself. Among our illustrations of the Banbury Excursion, we gave an instance of this at Bloxham,\* but this is far inferior in size and elaboration to the fine porch at Burford (see lithographic plate), and the equally large examples at Cirencester and Northleach, over the border.

Before returning to the churches in detail a word should be said concerning the Domestic work. Its strength on the present excursion

is apparent rather in the University city than in the neighbourhood. Although few of the villages have not a manor-house of some interest, the work is not on that scale which the Association saw on its last Oxfordshire visit. But if there is no building of the importance of Compton Winyates and Broughton, there are two or three manor-houses of some interest, besides some smaller examples in the villages and towns. Taking them in order of date, the two oldest, the manor-houses of Minster Lovell and Stanton Harcourt, have suffered considerably. Both are in ruins, the former more than the latter, and both likewise date from the fifteenth century.

Minster Lovell is but a shell. Situated picturesquely by the side of the Windrush, in close proximity to the church, and well protected by a grove of trees, it appeals more to the eye of the artist, perhaps, than to that of the architect who wishes for an abundance of detail. The principal part now remaining is the Great Hall, raised above a low ground story, and with windows high up in the walls. A good vaulted passage is at the north-west angle, which might have been the chief entrance; and close by, against the hall, is a cloister with good windows, having four-centred rear-arches with pierced spandrels. A detached building with a good octagonal staircase stands nearer the river, but all between has been ruthlessly destroyed in making a road, the object of which is not quite apparent. No doubt much of the building pulled down has been re-used for the road, and there does not seem much likelihood that even excavation would reveal much more of the plan.

At Stanton Harcourt we have a better guide, as an old ground-plan is still in

\*See Builder, September 12, 1885.

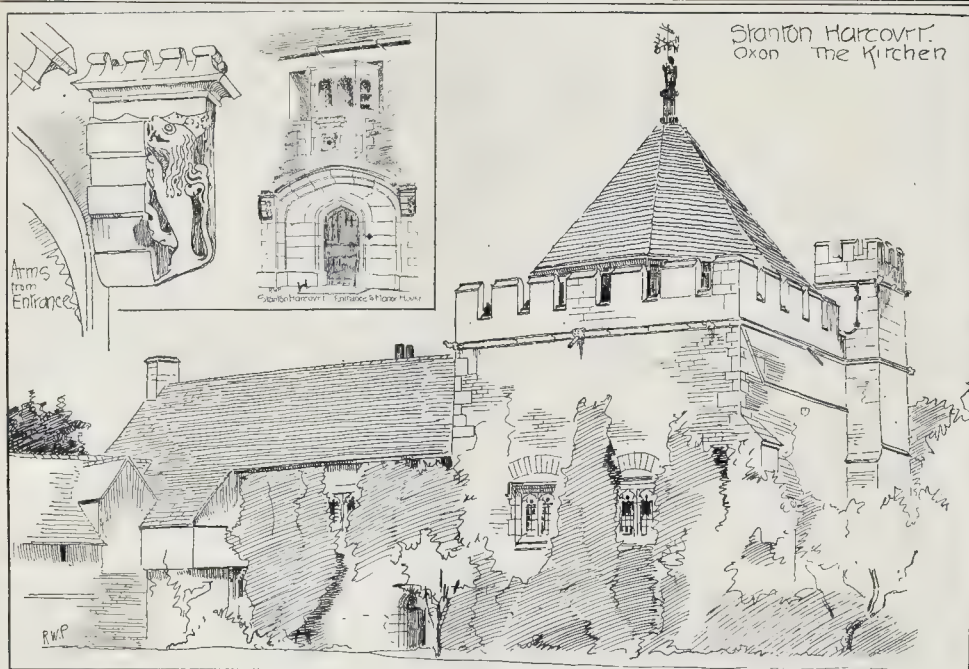


Fig. 1.



Fig. 2.



Fig. 3.



Fig. 4.

existence, — rough, but probably reliable. As in most of the houses of that date, the buildings were arranged round a quadrangle. In this case the north side was occupied by the great hall, with the "screens" and butteries on its west side, and the chapel and retiring-rooms on the east. The west side seems to have been taken up entirely with the great kitchen (fig. 1) and offices. How



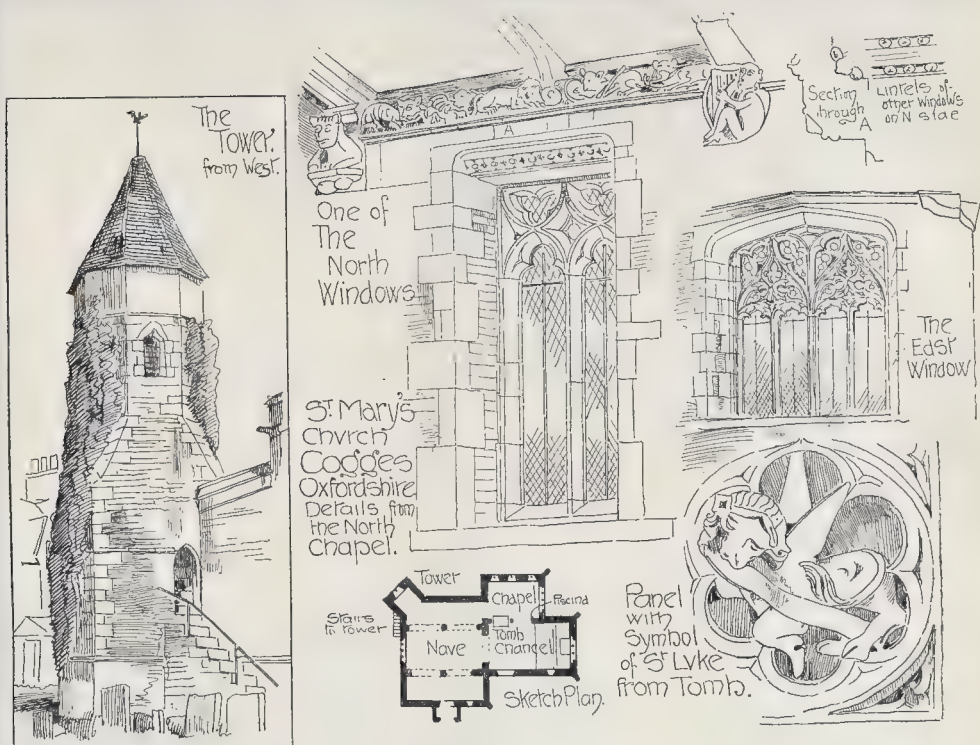


Fig. 5.



Fig. 6.

the east and south sides were filled up does not seem clear. It is probable that only a curtain wall existed on the south, with perhaps a moat. Further eastward, near the church, were the fish-ponds, which still exist.

A detached gatehouse stood north of the main block, its entrance being nearly opposite the entrance to the "screens." It has been incorporated into the later residence, which is still in use, and on its north side is the old four-centred arch, with a little oriel above, and the dripstone terminations with the arms of Harcourt impaling the crowned lion rampant of the Darrells (fig. 1). The kitchen before mentioned is a large square pile, with a low octagonal lantern, over which rises a pointed roof, and a good vane as a finish. Four sides of the lantern were glazed and four left open,

the draught being regulated by shutters or luffer-boards worked from below. Inside, the great fireplaces remain, and an old pair of fire-dogs and some kitchen utensils, which, if not coeval with the building, certainly testify to having done their parts for a century or two in ministering to the wants of mankind.

Hall and screen, parlour and bedroom, have all disappeared, and the only portion of the north side left is the chapel, with two stories over, one of which has been immortalised by Pope: he translated some of Homer here, and emphasised the fact by scratching it on the window. The pane is at Nuneham. The chapel itself is in a direct line with the church, its east window facing the west window of the latter. It has been decorated in recent times, and the sanctuary portion is

vaulted in stone with some good bosses. A general view of this and the church is given in fig. 2.

The next manor house is that of Water Eaton (see lithographic plate), a fine Elizabethan house situated on the banks of the Cherwell. The arrangement was very symmetrical. A quadrangle, with the house on one side and the entrance gate on the other, and outbuildings on either side at the extreme outer corners, made a picturesque group, and if we except the loss of the old garden, which existed south of the house, it may be taken as much the same in appearance as in 1585, —the date which is recorded on a doorway inside. The great gates have gone, it is true; and the broad drive, which either went direct to the house or curved round the quadrangle,

has disappeared. Its general design is extremely simple, as will be seen from the view, the arrangement of the two-storied bay on the left-hand of the porch reminding one somewhat of Woollass Hall, in Worcestershire. No carving appears on the front,—not even the usual panel with the arms and mantling, and general proportion and delicacy of moulding are left to play their part instead,—and excellently they do it. The interior is not remarkable for much except the quantity of oak panelling, and the odd "up and down" arrangement of the rooms. The chapel lies north of the house, and is interesting as being coeval in date with it.\*

A still later example is Burford Priory, built in the time of James I., and once the residence of Speaker Lenthall, who died here in 1662. It is now in ruins, like Kirby, which it somewhat resembles, although much smaller in scale. The front originally was twice the present length, for in 1808 the old front was partly demolished, the features left (the central porch and the extreme gables of the side wings) being brought close together and rebuilt. This to some extent accounts for the serious settlement to the right of the porch. The chapel is a curious little building at the end of a passage, which projects from the south end of the building. There is much delicate work, especially in the gallery, and the window tracery is extremely effective. In the house itself the drawing-room, with its plaster ceiling, and the principal staircase, with twisted balusters and considerable traces of inlay on the treads and landings, are the chief points. Burford town is full of old houses. A large building (now the Salvation Army Barracks, fig. 3) is in the main street, and was formerly the "Bear Inn." There is a pretty little oriel window in the middle of the front, but the house has been a good deal pulled about and later windows inserted. The house which is now occupied as the Vicarage is dated 1672, with a good front towards the street. Higher up the town is the Old Tolsey, and several fragments, of which one is given (see left-hand side of fig. 3).

Of the two places south of Oxford,—Dorchester and Ewelme,—little remains of



Font, Burford church

Fig. 8.

the abbey buildings at the former; but at Ewelme, adjoining the church, is a picturesque hospital or almshouse with some good brick-work, and wooden bargeboards in the court. We give a view of the entrance (fig. 6), and also a sketch of the Old Grammar School, a good brick building with mullioned windows, standing below the hospital on the main road.

To return to the churches. Most of those on the list retain traces of Norman work. Itley remains in its primitive form,—a well-known and interesting specimen. In the others little beyond a wall or a door remains, Burford being an exception, the central tower

\* We noticed a similar, but more elaborate example from Somerset, at Low Ham, in *Builder* for October 20, 1888.



Fig. 7.

being practically Norman work to the belfry stage. Norman windows still exist at Stanton Harcourt; and for some unaccountable reason the outer door of that date, on the north side of Witney, has survived many alterations and additions. Transitional work occurs at Cogges in the nave arcade, and Early English fully developed in the chancel of Stanton Harcourt and Witney. But the chief glory of thirteenth-century work in this district is Witney spire, of which we give an illustration amongst the plates.\* The Lady Chapel at Burford was of this date, but very little now remains,—that little being incorporated with the Sylvester aisle, and consisting principally of windows and a door. There are also traces of the chancel having been of the same style. Decorated work is very abundant. To this belongs the fine work at Dorchester Abbey, with its beautiful Jesse window and sedilia (see plates), the Shrine at Stanton Harcourt (see plate), and most of the church at Kidlington, except the tower, spire, and nave clearstory. Cogges is nearly all of this date, including the curious little tower set diagonally at the north-west corner (see plate and figs. 4 and 5). Our view of Kidlington (fig. 7) shows the two chief Decorated windows at the east ends of the aisles or chancel chapels. The one on the south is exceptionally beautiful. Perpen-

\* A measured drawing of this tower and spire was given in the "Proceedings" of the Institute of Architects, 1884, by Mr. W. A. Pite, whom we have to thank for the plans of this church and Burford.

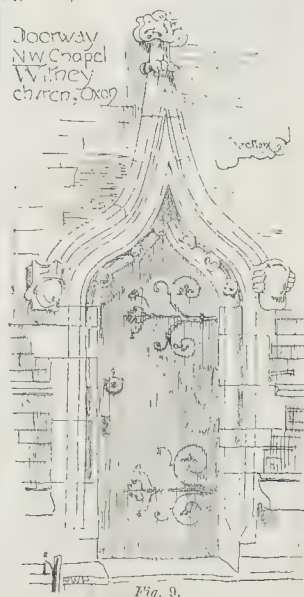


Fig. 9.





Fig. 10.

dicular work occurs in most of the churches. Ewelme and Minster Lovell are the only ones entirely in that style, the period being chiefly marked by alterations or additions to existing structures. The nave of Burford is the most extensive piece of work of this date, and there are also additions to Stanton Harcourt (the tower and chapel), Witney (the clearstories in nave and transepts), and Kidlington (nave clearstory). A word as to ground-plans. The simple Norman church is well represented by Ifley. Stanton Harcourt is perhaps the best of the Early English examples—a plain cross church without aisles, and a late chapel south of the chancel (fig. 13). Kidlington is also a cruciform church, with south aisle to the nave and chapels flanking the chancel. At Witney and Burford the original plan can still be made out, although both these churches have increased considerably. Witney has extensive transepts, and chapels attached to the north aisle. Burford, not content with chapels attached to the chancel, has one squeezed between the south transept and porch, and a still larger "aisle," which stands partly on the site of the old Early English detached chapel, and projects some feet further west than the nave. At Minster Lovell, an effective way of getting over the difference in width between nave and tower is shown in our interior view (see plate). Cogges has nothing unusual beyond its curious tower. Dorchester is a long Decorated church, with a south aisle to the nave, and two long aisles to the chancel; and Ewelme is an ordinary plan, with aisles running the whole length, as so often occurs in Devonshire.

The interiors of these churches are remarkable in many cases for the number of chapels and altars which either remain or of which considerable traces have been left.

Pre-eminent stands Burford, which had probably upwards of a dozen altars. One, St. Peter's Chapel, stands against the east respond of the north arcade, and occupies the entire bay. It is partly of stone and partly of wood, and is still in use as a side altar at the present time. In every possible position in this church we find the piscina, or the niche, retaining its colouring, besides a very large number of other points of interest,—a wooden pulpit, the font (fig. 8),\* with a series of niches in which are represented the Crucifixion, SS. Catherine, John the Baptist, Lawrence, Hugh of Lincoln. There are traces of frescoes in various parts of the building, and a series of tombs, some of those in the Sylvester and Tanfield aisles being of interest, although late in date. The addition of the spire on the Norman substructure was a work attended with some risk. Owing to



Fig. 11.

the low-lying ground near the river where the church stands, a serious settlement appeared on the north side, and in addition to inserting deep four-centred arches under the north and south sides, a flying buttress was built in the wall dividing the transept from

\* On the lead at the top are several names, amongst them "Anthony Sedley, 1649, Prisoner."

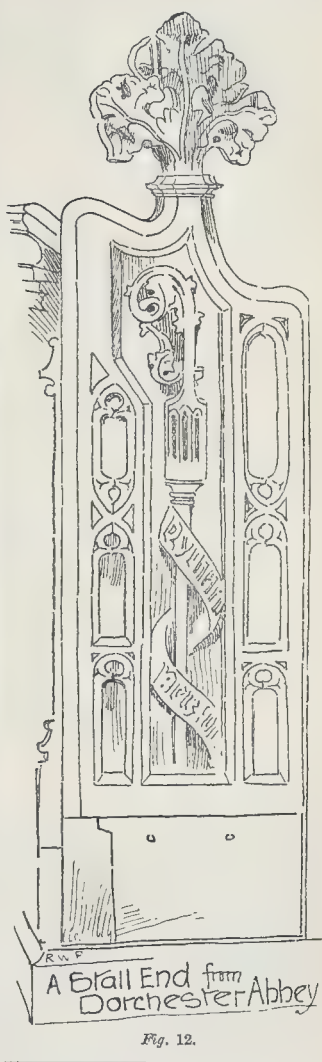


Fig. 12.

the Tanfield Chapel to resist the thrust. All this and the marks of the various roofs against the tower showing the gradual development of the nave, makes Burford a most interesting study,—it probably stands unique even in Oxfordshire. At Witney much of the dignity of the nave is marred by the lowness of the arcade, and the consequent large extent of wall between it and the clearstory. In the transepts will be found the chief points of interest. At the north end are two Decorated canopied tombs high up in the wall. Their somewhat unusual elevation is accounted for by the former existence of a crypt, of which considerable traces remain. This raised chapel has a counterpart at Burford in the "Burgess" aisle, which also has a crypt below. There are several traces of altars on the east wall, and at its southern end is an arch of wide span, now blocked, but formerly leading into another chapel. The tomb on the west side of this transept should be noticed. On the brass is an excellent representation of the Trinity. A curious little chapel has been placed between the porch and the north transept, and on the north-west side of the church is a larger one with a good doorway (fig. 9).

At Minster Lovell is a very fine alabaster

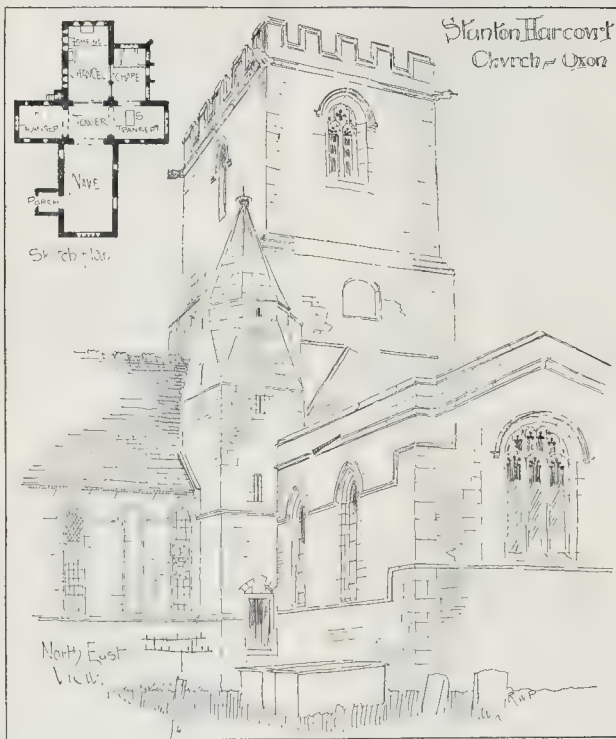


Fig. 13.

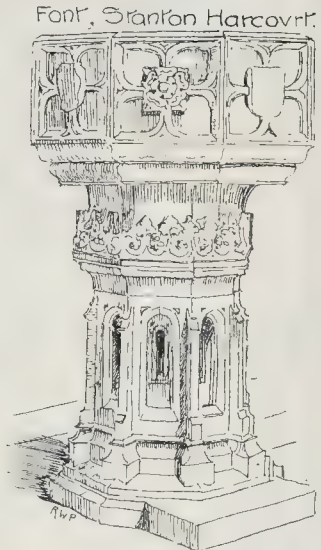


Fig. 14.

tomb, supposed to be that of Lord Lovel, who built the Manor House. The sides are panelled with shields and standing figures at intervals. Those of St. Christopher and the Virgin and Child (both shown in our lithographic plate) are especially beautiful, and noteworthy from the amount of effect which has been got out of them without undue projection from the sides. Altogether the figures project little more than  $2\frac{1}{2}$  in.\* The lion's head, too, on the tilting helmet, is a very delicate piece of work, and altogether this monument is worth some study. In Ewelme Church is another monument in the same material, but later in date, and decidedly inferior in execution. At Cogges is an interesting monument (see plate), in this case of stone, with some wonderfully bold representations of the Evangelistic symbols. We give one (fig. 5), and two others are shown in the view of the interior. The church at Cogges is an interesting Decorated building, and the north chapel has several bits worthy of notice. The windows are interesting, the east one retaining its old glazing in the tracery, and the carved cornices, with animals playing musical instruments, is very grotesque and effective. Continuous imposts in the arcading occurs in more than one place. The arches dividing the chapel under notice from the church at Cogges are good examples of Decorated work. Another type is exemplified in the nave arcade at Kidlington (fig. 10), which is, however, the more common one of the two orders of the arch dying into one in the shaft. In the nave arcade at Witney we have the same idea, but in this case the moulding,—two chamfered orders,—is simply carried round shaft and arch.

We have left Dorchester Abbey for the last notice, as it altogether differs from the others. Being partly monastic and partly parochial, it was saved and used for parochial purposes at the Dissolution. It was

\* Some similar work, perhaps by the same hand, occurs on the tomb in the chapel of Berkeley Church.

once cruciform, but the transepts have gone, and likewise the central tower. To Richard Bewforrest we owe the preservation of the building, it having been bought by him and presented to the parish in 1554. In its present form it is a long building, with nave and chancel of equal height. A side aisle to the nave had evidently an important altar, and some idea of the elaboration may be gathered from a bracket projecting from one of the columns of the arcade about 5 ft. from the ground (fig. 11). This might either have been a support for figures, or a portion of the rood screen which formerly must have existed in the parochial church. The east end was, however, that portion on which the fourteenth-century designer lavished his ideas and labour. Three fine windows light the sanctuary, a Jesse on the north, with figures both in stone and glass. On the south is a series of sedilia with the backs pierced and glazed near the top. In the south aisle is a remarkable door in the south-east angle and a double piscina adjoining (see lithograph), and some good monuments, that supposed (from the arms) to be to one of the Segraves being the finest (see plate). The stalls in the choir are of Bewforrest's time; one of the ends bears his name on a scroll accompanied by a pastoral staff (fig. 12), and another has the cross-keys of S. Peter, alluding to the dedication—SS. Peter and Paul.

Not much woodwork remains in the churches under notice compared with the richness of the rood-screens of such places as Charlton-on-Otmoor and others, but Stanton Harcourt retains an Early English chancel-screen of great interest, and there are screens of late date at Ewelme. To some of the fonts we have already referred. Dorchester has a valuable example of a leaden one, and Stanton Harcourt (fig. 14) and Minister Lovell Perpendicular specimens, the former now denuded of its heraldic shields, which have been barbarously cut off and placed in a frame on the adjacent wall. It is pleasing

to note, however, that vandalism has not been at work in the district to the same extent as in other places. Churches have been in most cases carefully restored, and are in good hands. We would draw attention, however, to the arrangement at the east end of Dorchester, which can scarcely be considered satisfactory. There is a tawdriness about the general appearance which is not in keeping with the thorough and good work surrounding it, and, apart from its colour, it does not look as if made for its position. It may be open to doubt what the arrangement here was. The treatment of the great east window, with its somewhat cumbersome central buttress, demanded a special form of reredos.

In conclusion, we may say that few districts will repay the student and the sketcher for the time spent on them better than that which the Architectural Association is visiting this week, and any of the places, even taken singly, will be a profitable field; and perhaps the chief feeling amongst those at the present excursion will be that there was so little time in which to see so much.

#### MYTHOLOGY AND MONUMENTS OF ANCIENT ATHENS.

NO branch of archaeological literature is more fascinating to the student than that relating to mythology. It matters little what were the sources of the marvellous fables that so frequently bear an impress of truth enveloped in an impenetrable veil of allegory, or whether such fables were nothing more than the mental reflections of men influenced by external appearances, physical effects being mistaken for independent invisible powers. It is enough for us to know that myths of all ages and in all countries have been a source of inspiration to the poet, enabling him to clothe with imagery the hard dogmas of religion, and they have given the painter and the sculptor a field for the exercise of the imagination more fertile than any field in the pages of Bible narrative. The prevalent idea among earlier nations that all things inanimate were endowed with the same spontaneity of action as man supplies the foundation of many of the fictions of mythology, and consequently a close investigation of natural phenomena, and of the characteristics of animal and vegetable life, helps to a solution of many an old-world fable. Again, the history of a people is so



imately interwoven with early traditions, and the boundary-line between fable and fact is often so difficult to determine, that history, based on these traditions, is robbed of half its interest if we exclude the fable and record only the fact. Where record fails we have to fall back upon the remains of monumental art, either in the form of sculptured allegory or those mythical representations of gods and men that are familiar to us on the painted vases and clypees by Greek artists. "When literature and monument go hand in hand," is a modern critic has observed, "when the passage in classical authors concerning works of art and the existing remains confirm each other, the passage giving us definite information concerning the monument and the monument showing us that the ancient author is to be trusted, then we have a state of things that is most satisfactory."

It was a happy thought, therefore, on the part of Miss Harrison, in studying the monuments and mythology of ancient Athens\*, to take Pausanias as a guide for the purpose of elucidating the mythology with reference to the existing monuments. The question arises whether the selection of this old-world chronicler was a judicious one, in the presence of more trustworthy authors and more brilliant narratives. Of Pausanias we know but little beyond his travelling notes, which stamp him as a keen observer, a ready listener, and a patient student of everything relating to archaeology. Living in an age which was essentially an age of peace, when the Romanised Greek was kept in restraint under the pliable rule of Hadrian and the still gentler sway of the Antonines, travellers like Pausanias had better opportunities for quiet observation than in the more stirring time of the Caesars, or in the period approaching the dismemberment of the Roman Empire. But the impartial opinion on the merits of Pausanias, as the author of the best guide-book of his time, need not much concern us. In the eyes of critics like Scaliger he might have been *omnium intractabilium mendacissimus*, but the unprejudiced reader of his narrative will be inclined to agree with Miss Harrison that it is the careful, conscientious, and in some parts amusing and quite original narrative of a *bona-fide* traveller. A perusal of his studied phraseology, which has now received so able and scholarly an interpretation at the hands of Mrs. Verrall, gives indication of a certain bias in the mind of the traveller, which mars the value of many of his statements. As a stern believer in the gods of his country, and a loyal upholder of every myth and tradition that touched the borderland of his creed, he was too apt to regard every monument he saw as an exponent of a myth or endowed with a mythical personality. Faithful to his religion, and watching with a awakened interest the struggle then beginning between the decaying Paganism of the old world and the rising Christianity of the new, what wonder that Pausanias, in arranging his notes at a later period of his life in the quietude of his Asiatic home, should have given a religious, or, rather, mythographical, character to his narrative? It is this aspect of his writings, and not the descriptive qualities of his narrative, that has had special attraction for the author of this volume. "I shall pass with scant notice," says Miss Harrison in the preface, "all temples, buildings, statues of the decadence, before they ever so showy and spacious; I shall be sparing in details of Roman architecture and topography,—let those discuss them to whom they are dear,—but wherever Pausanias touches to tell some early legend, or to describe the rude image of some primitive faith, we will stop with him." We are unable to follow the author through the maze of allegory that necessarily pervades this work, but if we cannot stop by the way to analyse every local or foreign cult that Athens welcomed within her hospitable walls, we may at least offer

Miss Harrison a word of praise for the skill and clearness with which a difficult subject has been handled.

If we are to accept the testimony of Hesiod that there were in the Greek mythology 30,000 gods on earth, guardians of men, we may well pause before we enter the portals of Olympus to investigate the powers and duties of these celestial governors of the human family. For us there is no need to go further back in the history of Athens than the advent of the first civilised man that the Attic tribes recognised as a ruler. With Cecrops "the real live mythology of Athens begins," and, if we are to accept tradition, the two great events in Attic history,—the strife of Athens and Poseidon, and the birth of Erichthonios,—are intimately associated with his reign:—

"The legend of a strife between two gods for a favoured city was not confined to Athens. Hera and Poseidon, Pausanias tells, contended for Argos. The ancient dwellers in Argos, Phoroneus, Cophisus, and Asterion were, like old King Cecrops, arbitrators in the strife; they, like Cecrops, adjudged the prize to the goddess, and Poseidon in his vengeance took away their water from the city. The manner of the strife at Athens is always the same; the rival gods show their tokens; it is only the manner of arbitration that differs. Sometimes it is Cecrops, sometimes the Athenians, who decide by vote; later probably, when the Olympian system got the upper hand, it is the twelve orthodox Olympian gods. The rise of such a story seems easy enough; a queer crooked olive-tree, too strangely shaped to be quite of natural growth, and near to it a brackish spring and an old mark on a rock that might be a trident; these, with the rival worship of Athens and Poseidon, were enough material for a myth-making age. One point, however, deserves notice; there is, so far as I know, no trace of the myth earlier than Herodotus."

With such a foundation for Attic genealogy in a myth-loving age, we need not here pause to consider the legendary history of the immediate successors of Cecrops, of Erichthonios and Erechtheus, and the fabulous career of the daughters of Cecrops, who are traditionally associated with the three daughters of Erechtheus. Rather let us enter the gates with old Pausanias, and see whether, with the aid of Miss Harrison's lucid commentary, we can arrive at a solution of some of the doubtful problems connected with the chief monumental remains of ancient Athens.

A glance at the plans in the present volume shows how largely our knowledge of the topography of Athens has increased since the first issue of Stuart and Revett's great work in 1762. This result is due to the labours and emulation of various representative archaeological bodies, but mainly to the patient investigation and enthusiasm of so able a scholar as Dr. Dörpfeld. Entering the city by the Sacred Gate, better known as the Dipylon, we are confronted by the precinct of Dionysos, the stoa of Attalos and the Giants, and of other stoa, the sites of which, in the light of present investigations, must still be regarded as conjectural. Of Dionysos we know that he came into Attica as a wanderer, and that after a long sojourn in the country his deification was ultimately marked by appropriating to his worship a whole precinct within the city walls. The affection in which this youthful and effeminate god of wine was held by the ancient Greek is evidenced by the great and lesser festivals in his honour. As it was with the old Greek, so it is apparently with the new; for Mr. Theodore Bent notes in his book on the "Cyclades" that in Paros "there is a church dedicated to the Drunken St. George. On November 3, the Anniversary of St. George's death, the Paroites usually tap their wine and get drunk; they have a dance and a scene of revelry in front of this church, which is hallowed by the presence of the priests." Pausanias next takes us past the site of the Metron or sanctuary of the mother of the gods; the Bouleuterion or council chamber of the Five Hundred; and the Tholos, a circular building of doubtful purposes; then, skirting the foot of the Areopagus, brings us to the hill of the Pnyx, the site of which and the controversy as to its identification are matters of great interest:—

"The word 'Pnyx' is used in two senses,—a wider sense, in which it means an extensive hill

district; a narrower, in which it means the place of assembly for the Athenian people. In the time of Plato it clearly included in its wider sense the whole hill district to the south-west of the Acropolis and Areopagus, possibly the Areopagus itself."

The Pnyx, then, in its narrower sense, was in the form of a theatre, but arranged, as Pollux informs us, "according to antique simplicity, not with the complexity of a theatre," by which it is inferred that it had an altar and a space for spectators, but was not provided with a stage, or with stone seats and porticoes. "Beyond the Kerameikos and the stoa called Basileios," says Pausanias, "is a temple of Hephaistos." Recent investigations have clearly proved that this temple, the best preserved example of the Doric order in the world, is the one hitherto known as the Theseion, or Temple of Theseus:—

"Up to the year 1838 it went usually among travellers by the name of the Theseion, a title so time honoured that it will be necessary to set forth in some detail the reasons for its rejection. One traveller only up to that date,—Cyrus, of Ancona,—called it the temple of Ares. This name was revived in 1838 by Ross. Curtius inclined to the view that it was the temple of Herakles in Melite. Dyer calls it the Amazonium; Lange, the Temple of Aphrodite. To Pervanoglu is due the credit of first giving the temple its right name, the Temple of Hephaistos; and Dr. Dörpfeld supports this view by arguments which can scarcely be contravened."

Next to the Acropolis, no quarter of Athens has a greater interest to architects than that known as the city of Hadrian. This building-loving Emperor, who left memorials of his presence in every corner of the Roman Empire, showed his affection for the Athens of old days by a munificence that has no parallel in the history of nations. To associate his name with the completion of the Olympieion was a worthy ambition; and though it was never finished, we have the testimony of Pausanias that "the Temple of Zeus Olympios was dedicated by Hadrian, the Roman Emperor, who also set up the image of the god, which is worth seeing." He further informs us that "leaving out of account the colossal figures at Rhodes and Rome, it exceeds in size all other images. The material is gold and ivory, and the workmanship is good, considering the size. Outside this sanctuary are two statues of Hadrian in Thasian marble, and two in Egyptian marble; in front of the pillars bronze statues are set up, called by the Athenians, 'the Colonies.' The whole enclosed space round the temple is about four stades in circuit, and is completely filled with statues. For every city has presented a portrait statue of the Emperor Hadrian, and the Athenians have overtopped all the rest by setting up the remarkable Colossus behind the temple." The whole subject has given rise to much interesting discussion during recent years, and, thanks to Mr. Penrose in conjunction with Dr. Dörpfeld, we now know all that we are likely to know concerning this gigantic unfinished temple and the peribolos, of which a large portion is still visible. Respecting the so-called stoa of Hadrian, the seven remaining columns of which are familiar to every traveller, recent excavations confirm the description given by Pausanias of a building he saw in this part of the city, which he describes as having a "hundred pillars; these are of Phrygian marble, and the walls are arranged like those of colonnades. There is a building there, with a gilded roof and alabaster stone, also decorated with images and paintings; this building contains books. There is, moreover, a gymnasium, called after Hadrian; this also has a hundred pillars of marble from the Libyan quarries." The most remarkable coincidence with the words of Pausanias is, as Miss Harrison informs us, that the outer colonnade, laid down by the Archaeological Society of Athens, and of which a plan is given in this volume, is furnished with columns exactly 100 in number. Of the Tower of the Winds and the Monument of Lysikrates nothing new has been discovered, but it is satisfactory to learn that a portion of the street of the Tripods, which was graced by these monuments, and was evidently a fashionable promenade in old

\* "Mythology and Monuments of Ancient Athens," being a translation of a portion of the "Attica" of Pausanias, by Margaret de G. Verrall, with introductory essay and archaeological commentary by Jane E. Harrison, illustrated. (London: Macmillan & Co. 1890.)



days, has now been clearly defined. No mention is made by Pausanias of the Dionysiac Theatre which, at the present day, is one of the most conspicuous objects at the foot of the Acropolis. The study of this structure, under the direction of Dr. Dörpfeld, has revealed the remains of four distinct stages,—the stage of Lycurgus, a second late Greek or Early Roman modification of it, a stage built in the reign of Nero, and the Logeion of Phædrus. If we desire to know what the earlier Greek theatre was like, and to recall the stage of Æschylus or Sophocles, we must give up our cherished conceptions founded on descriptions by Latin authors:—

"To get at the fifth-century theatre we have to study small and obscure remains, observable only to the trained eye. What one actually sees is a place shaped like an arena and suggesting nothing further; it is shut in by a balustrade of marble steps—a protection necessary, indeed, when the Greek dancing-place became the amphitheatre for Roman wild-beast shows; but unmeaning for early days. All this must go; the splendid array of seats, which are to the modern mind the theatre, must go; not only the stage of Phædrus, but every scrap of stone stage building must also go. . . . The theatre of the Greeks was originally an orchestra, or dancing-place, *that and nothing more*, yet enough for Dionysos, the Dance-lover—an altar and a level place about it, circular because the worshippers danced round in a ring. Such a place for worship may well have preceded even the temple itself."

We must pass by the chapter on the Asklepieion, the site of which has now been laid bare, with its great altar, the sacred well, the portico and the precinct wall. Miss Harrison's elaborate commentary on the attributes of the presiding deity and of the existing remains forms a valuable contribution to mythological literature.

And now we can approach the Acropolis, to which, says Pausanias, "there is only one access; no other is practicable, as the hill rises abruptly on all sides, and is fortified with a strong wall." The old traveller's brief notice of the Propylæa, "with its roof of white marble," and its picture-gallery on the left of the gateway, indicates very clearly that the building, as he saw it, was then in a very incomplete state. Indeed, what he saw was very much what it is now. Had there been other galleries he would have mentioned them, for the purpose of describing, as was his custom, the statuary and images relating to the legendary history of the Athenians. It has been reserved to the School of Archaeology to solve the vexed problems affecting the extent of the structure, and to realise the character of the original plans as designed by Mnesikles. Of course, there is much in this suggested restoration that is conjectural, but the arguments adduced by Dr. Dörpfeld are so plausible that his views are likely to meet with general acceptance. We refer the reader to the train of reasoning that has resulted in the plan of the completed building given in this volume. Pausanias could have had but slight acquaintance with architecture, his notes on the Parthenon being confined to a description of the images he saw in the temple, and the legends associated with them:—

"We are accustomed to call this temple 'The Parthenon'; but such was not, could not ever be, its official name. Its full title was 'The Temple of Athene Polias.' For short it was known as *the temple*. That it bore the title of 'Temple of Polias' down to quite late days is, perhaps, more vividly shown by a certain passage in Lucian than anywhere else. . . . The name Parthenon was then a sub-name given to the great new temple of Athene Polias comparatively late, and derived, like the title Hekatompedos, not from the whole, but from a portion of the structure. The temple, in fact, consisted, as the plan clearly shows, of two main parts, distinct, and without internal communication. The larger and eastern half was called Hekatompedos, and was fronted by a pronaos; the smaller western half was called the Parthenon, and was itself fronted by a pronaos. The back or western chamber of a temple was usually called the Opisthodomos. It is natural to ask why an exception was made in the case of this particular temple. The answer is simple. After the new temple was built, there still existed, and was in use, another Opisthodomos,—*i.e.*, of the old temple. To avoid confusion with this, the Opisthodomos of the new temple was not called Opisthodomos, but for distinction Parthenon (Chamber of the Virgin)."


The summary manner with which Pausanias treats that portion of the Acropolis on which the Erechtheion stands is unfortunate, as it leaves a settlement of the extent and internal plan of this and other edifices still undecided. "There is also a building called the Erechtheion," and further on he speaks of the images "in the temple of Athene Polias," adding that "the temple of Pandrosos adjoins the temple of Athene." With regard to the Erechtheion, attention should be called to two points of great importance:—

1. Pausanias regarded it rather as a dwelling-place than as strictly a temple. 2. Clearly it was regarded as belonging to Erechtheus, not to Athene. The "good house of Erechtheus" had long since perished, but its memory, no doubt, remained, and when the new Erechtheion was built to incorporate and commemorate old cults, it was natural that a building should be upreared, which was not so much strictly a temple as a sacred dwelling-place. The Erechtheion, I am fully convinced, will be better apprehended if it be considered as "a house" as well as, if not instead of, a temple.

It is quite possible that the building, as we now see it, was raised on the foundations of a portion of the palace-fortress of King Erechtheus. Respecting the site of the temple of Pandrosos we know next to nothing, as no traces of the walls have been discovered, but as two inscriptions recently unearthed refer to "two pediments, one towards the east and the other towards the Pandroseum," it is reasonable to infer that the Pandroseum was necessarily west.

Want of space precludes a reference to the interesting chapters relating to recent discoveries on the Areopagus and in the unearthed Street of Tombs. Enough has been said, however, to show the great value of this work, which "is addressed, not to the professional archaeologist, but to the student." Further discoveries will, no doubt, enlighten us on many points connected with life in Ancient Athens, and those mysterious cults that were so intimately interwoven with it. For the present, we are quite content with Miss Harrison's lucid commentary, which merits a high place in archaeological literature.

#### NOTES.

T is a noteworthy sign of the times that at a meeting of the International Tailors' Union in East London two or three days ago, to consider the report of the Committee on the sweating system, the principal resolution moved included a demand "that all work-places provided be clean and healthy, free from any objectionable or offensive matter, and that modern ventilating-shafts be used, so that each worker shall be supplied with a sufficient amount of fresh air during work hours." The phrase "modern ventilating shafts" seems to indicate, it is true, some kind of belief in an infallible system of supplying enough fresh air to each individual, which is less often met with than the framers of the resolution probably suppose; but they are quite right to want that, and if they stick to their demand they will get it, sooner or later. The Tailors' Union should, however, understand, that in asking for a sufficient supply of air for each person, they are asking for what is still an unattainable luxury in places frequented by persons much better off and more exacting than journeyman tailors have hitherto been. We could tell them of one of the most aristocratic places of entertainment in London, where a few weeks ago one of the audience had to go out in the middle of a concert and bully the managers of the building into adopting the rude expedient of opening some windows, without which some persons would probably have fainted for want of oxygen before the evening was over, "modern ventilating shafts" having no existence in the building. It may surprise them to hear that in the London season people are daily nearly choked in the dining-rooms of millionaires, with every luxury about them, and their appetites destroyed and headaches brought on, by simple want of necessary air to breathe.

They will find plenty of fashionable churches with no method of changing the vitiated air, and where people go to sleep, or even faint occasionally, from want of fresh air and of "modern ventilating shafts." The Tailors' Union, in asking for an adequate supply of fresh air, are asking for a luxury which is at present only to be counted on in two classes of buildings in this country, prisons and hospitals. But let them persevere in their demand. If they can succeed in getting an adequate supply of fresh air, introduced in a scientific manner, into tailors' workshops, they will have set an admirable example, which perhaps will be eventually followed in theatres, concert-rooms, churches, and West-end dwelling-houses.

**T**HE draft classification and schedule of maximum rates submitted to the Railway Companies by the Board of Trade, does not, as we anticipated, meet with the approval of the former. Lord Colville of Culross stated at the half-yearly meeting of the Great Northern last week, that the schedule did not sufficiently recognise the rights of the Railway Companies, and that it would be the duty of the Directors to make further representations to the Board of Trade. The Chairman of the Midland (Sir M. W. Thompson), says that the Board have gone far beyond what the traders had asked them to do, and have cut down rates to an extent which leaves no margin whatever for contingencies. The London and North-Western meeting was being held as we went to press, and as the correspondence with the Board has been conducted by this Company on behalf of the others, Sir Richard Moon, no doubt, alluded to it at length. The position taken up by the London and North-Western can, however, be gathered from copies of the correspondence referred to, which accompany this half-yearly report. They declare that the adoption of figures such as those proposed "would diminish the present annual income of the company by so large a sum as to render it quite impossible for the directors to submit to the proposal except under the compulsion of Parliament." They respectfully ask whether the Board adhere to the assurance of the Prime Minister, that their revenue should not be "confiscated" (a word which occurs more than once in the course of the correspondence), and if not, upon what principle the rates have been fixed. The Board reply that they have simply proposed what they considered "just and reasonable,"—having had no other direction from Parliament,—and failing to come to an agreement with the companies, they will present their report without delay. It is further stated that this action will not preclude the consideration of any facts and figures which the companies may lay before them after the report has been submitted to Parliament. Consequently, a number of fresh returns and comparisons are to be prepared; and as the clerks and officials have had more than enough of such work in connexion with this business already, they will be quite ready to join in the general regret that the company and the Board of Trade have failed to come to an agreement upon it.

**T**HE rambling discussion in the House of Commons on Monday evening, in regard to the Lords' amendments on the Removal of Gates Bill, which was in the end adjourned, formed a curious example of people who put unreasonable arguments which people will put forth in support of a course for which there are diplomatic reasons which cannot be openly brought forward. Mr. Lawson, indeed, let the cat out of the bag (and we doubt if the County Council will thank him) in his unguarded remark that "there were 300 gates and bars in London, and if the Bill were passed in its present shape those obstructions would never be removed." In other words, the County Council want to be free to remove them without incurring the responsibility of compensation for which the Bill as amended would form a precedent. The Solicitor-



General, we are glad to observe, upheld the principle that where private interests were injured by work carried out for the public benefit, "the persons deprived of their property should receive compensation." The "200 gates and bars," to the residents living near them, are a most important element in the comfort of London life, consequently in the value of the house property affected. It is ridiculous to say otherwise: indeed, it is questionable whether it is altogether for the public benefit that all of these gates should be removed, and that the special character of seclusion, belonging to some portions of London, should be thus entirely destroyed. The gates in the Bloomsbury district are more open to attack than most others, being in the way of the access to three great railway stations. But even in this case those who are injured have a right to be considered.

ON Monday night, Mr. Cavendish-Bentinck, acting as the mouthpiece of Sir William Harcourt, again questioned the Home Secretary as to the Police Buildings on the Embankment, and as to whether, in getting them carried out, he "had consulted any authority on architecture." Sir William Harcourt must have known perfectly well that Mr. Norman Shaw was the architect of the building, but we presume he is one of those people who imagine that an architect is not any authority on such a subject. Mr. Cavendish-Bentinck proceeded to state that "the buildings had been viewed with great disfavour by some authorities in the country." By whom? We know of no one who is a recognised authority on architecture who has expressed disapprobation of them. The whole thing is a foolish pretence, to lay a trap for a political opponent. Mr. Matthews's reply, as reported in the *Times*, was short and much to the point. He said "that he found the site partially unoccupied, and he had to cover it as best he could. He took the advice of high artistic authorities in London, persons who were at the head of art in this country. He asked them the name of the best architect to employ, and he commissioned that gentleman to put up the best building he could for the money." Could he have done more?

IT is to be regretted that the Government have been compelled to drop their Savings Bank Bill, through the persistent opposition of Mr. Storey, the Member for Sunderland. It was supported by all persons interested in the subject. Its loss shows what can be achieved by vanity and ignorance in the House of Commons. For when there is a consensus of opinion in favour of a measure such as this, which had also been carefully examined by a Committee of the House, it is only a vain belief in a man's assumed superior intelligence which can enable a member to prevent the passing of a useful piece of legislation. If the House of Commons did not daily exhibit illustrations of the manner in which muddle-headed men believe themselves to be paragons of wisdom, and also show how utterly vain are many of our heaven-born legislators, it would be impossible to believe that anyone could have so little regard to the opinions of other men as alone to oppose the passing into law of so useful and a practical measure as the Savings Bank Bill. At the same time, while Mr. Storey's conduct appears wrong, it is obvious that there is a tendency at the present time for the Government in power to treat discussion of non-party measures as undesirable, whereas every measure, political or social, requires a discussion of its principles and details within reasonable bounds.

ON Monday last the clause in the London County Council Bill as to the height of buildings came under discussion in the House of Lords on the third reading of that measure. The Select Committee by whom the Bill was examined allowed as the maximum height 30 ft. and two stories. Lord Stanley, of Alderley, moved as an amendment that the

height should be 70 ft. and one story. This amendment was, however, negatived. Lord Wemyss appears to have hit the right nail on the head when he inquired why there was no clause making the height of buildings bear some proportion to the width of the street. There can be no question that such a clause should have been in the Bill. Seventy feet in some streets may be much too high. No one, we suppose, can doubt that Northumberland-avenue has been spoilt by the height of the buildings—had it been double the width this would not have been the case. It is clearly too late in the day to object to high buildings in London; the value of land makes them a necessity, and mechanical contrivances make them habitable, and that the top story of a high building is a healthy place can scarcely be doubted. But what is required is their regulation, and for this purpose the width of the street must be considered.

AS we have now entered upon the legal Long Vacation, it is opportune to point out that a great deal of good work has been done during the past legal year by the Official Referees. This tribunal is now more and more resorted to in cases of action for dilapidations, and in claims for various forms of work done, such as building and decoration. It is less expensive than private arbitration, and the Referees are becoming thoroughly at home in the examination of builders' accounts. The main thing is that the Referees should be kept up to a high standard of efficiency, and that they should not be old men. At the present time Mr. Hemming, Q.C., and Mr. Ridley thoroughly answer these conditions,—both being not only first-rate lawyers, but men considerably above the average in mental capacity. Mr. Verey is a painstaking official, but of inferior calibre to the two first-named referees. When the system of Official Referees was first inaugurated it was very nearly a failure from the new referees being men too old for the work, but at the present time it is one of the few satisfactory parts of our judicial procedure.

THE Directors of the North British Railway have, it seems, resolved to take immediate action with a view to obviate the congestion of traffic at the Waverley Station, Edinburgh, to which we referred last week. It is a state of matters which could not possibly be allowed to continue, and for which a remedy must be found, at whatever cost. The position of the station is such as to render it very difficult to increase the accommodation, but the Directors are to direct their efforts to its extension and the improvement of the approaches. They have, it appears, three propositions to make, the acceptance of any one of which would effect the purpose in hand. The first of these is to drive a tunnel through Charlotte-square, George-street, and St. David-street to the Waverley Market, which would be added to the station. The second proposal is similar to that submitted by the Caledonian Railway in the Bill which was rejected this session. The third is to run a line alongside the embankment in the Princes-street Gardens, which would be covered in and added to the breadth of the embankment. For the accommodation and further extension of the goods traffic, it is proposed to acquire part of Macdowall-street and the gasworks, to the eastward of the present station. The removal of the gasworks from their present position would effect a desirable improvement in the amenity of the district, and is likely to meet with general approval; but much difference of opinion is likely to arise as to the other proposals. Whatever scheme is carried out, it is to be hoped that the aesthetic aspect of the matter will not be overlooked; and if the railway Directors are wise, they will make the scheme as comprehensive as possible.

THE official list of awards in the architectural division of this year's Munich Art Exhibition has been rather a surprise to the German architects, and although we

have reason to believe that they in general quite concur with the decision of the jury, we hear that there is a certain feeling that will probably lead to our seeing the works sent in for the next exhibition being greater in number and, at the same time, perhaps superior in quality. As already stated by us in our issue of the 2nd inst. [p. 95], the first medal fell to Mr. Waterhouse, the work sent in being the "Natural History Museum, South Kensington"; three second medals were given away, and these fell to Mr. Anderson, of Edinburgh (Scotch National Portrait Gallery); Baudirector Hugo Licht (Restoration and Extension of the Leipsic "Rathhaus"); and Messrs. Rettig and Pfann, of Berlin (primated design for a national monument to Emperor William I.). Although only twenty-five designs were to be found in the architectural room, some good names could be seen attached to the numbers, and we are hence all the more pleased that the first prizes fell to Great Britain.

THE controversy about the so-called "Eubouleus" head seems likely to go on for some time. Mr. Ernest Gardner, reporting on the present state of the National Museum at Athens, writes:—"A word of protest may be raised against making the undoubtedly authentic Scopas heads from Tegea yield the place of honour in the fourth-century room to the very doubtful 'Eubouleus' head from Eleusis. Surely few who have seen the Hermes of Praxiteles at Olympia can accept the theory that attributes this to the same hand. Yet, apart from such a theory, the head has no right to its place." The question is, of course, a double one. Is the head by Praxiteles? Is it rightly called "Eubouleus"? We are with Mr. Gardner in his doubt about Praxiteles. There is to our minds little of the masterpiece about the Eleusis head, but then unhappily very good sculptors have been known to do very bad work. That the head must, anyhow, represent a youthful under-world god is again maintained by Dr. Winter in his paper on Iacchos in the *Bonner Studien* mentioned below.

UNDER the title "Bonner-Studien," the pupils of Reinhard Kekulé have just dedicated to their justly-popular professor a collection of monographs in memory of his work at the Bonn University. The list includes the names of some of the most distinguished among rising archaeologists. Dr. Paul Wolters contributes an article on the date of the building of the Nike temple at Athens, illustrated by a series of sections showing the relation between the foundation of the Nike temple and those of the adjacent wing of the Propylæa, and also the position of the newly-discovered inscribed blocks belonging to the statues of horsemen seen by Pausanias. His elaborate examination of the site leads him to the following conclusions:—1. Cimon was the builder of the Nike pyrgos, but not, as Bendorff has recently maintained, of the Nike temple. 2. The original plan of Mnesicles for the south wing of the Propylæa presupposes the existence of the pyrgos and of the Nike altar. 3. The plan and position of the temple was the result of the modified scheme adopted by Mnesicles, and is thus as it were a monumental protest against the encroachments meditated by Mnesicles in the precinct of Artemis Brauronia. Another paper of general interest is by F. Dümmler, whose name ranks very high, if not the highest, as an authority on the chronology of Greek vases. His monograph is practically a criticism of Dr. Klein's position in his "Euphronios" as seen in the light of the recent finds in the Acropolis. Dr. Klein, writing before these discoveries, examined the relation between vase painters of the date of Euphronios and the great monumental painters—supposed then to be contemporaneous. He came to the conclusion that the influence of wall-painting on vase-painting was



—barring the choice of subject—*nil*. We know now that the cycle of Epiktetos (including Euphronios) preceded Polygnotos, instead of being contemporary with him, so that with this premise the whole of Dr. Klein's deductions fall to the ground. Space forbids our even resuming Dr. Dümmler's monograph; but it is of the first importance to all students of Greek Ceramography. It seems a pity that a paper so valuable should be hidden away in the "Bonner Studien," and if it must be so hidden, why cannot foreign publishers give us a list of the contents of such collections of monographs?

**T**WO daily newspapers exulted last week over the recent demolition of Nos. 1 and 2, Rolls-yard, Chancery-lane, with the attendant discovery of the supposed "fourteenth-century" window in the chapel's southern wall\*, and the increased facilities thus gained for the working of the Record Office. In his report of this year, the Deputy-Recorder, referring to the blocked-up windows now uncovered, writes: "One of which certainly dates from the fourteenth century." It appears that several of the ill-conditioned houses along the western side of Rolls-yard, and fronting Chancery-lane, are still used for the storing of departmental papers, despite the dangers from fire to which their contents are exposed†. In Rolls-yard were formerly the Curator's, Subpena, Petty Bag, and other minor offices. The house next north of the gateway served, fifty years since, as the Marshalsea and Palace Courts office, its records being kept in Clifford's-inn and White Bear-yard, Eyre-street, Hatton-garden. The house recently demolished was built circa 1785 for the Clerk of the Records and the Master's secretaries; it had latterly served for purposes of the Record Office. Perhaps the Rolls Chapel was used for the deposit of records upon the annexation of Henry III.'s *Domus Conversorum* in 1377. Hatton (1708) mentions daily attendance in the chapel "for taking in and paying out money (pursuant to order of Court), and for making Searches of Rolls, &c." A report upon the state of the documents kept therein was made to Parliament in 1732 by a committee appointed to examine all such repositories, after the partial destruction by fire of the Cottonian Library at Ashburnham House, Little Dean's-yard, Westminster, on October 23, 1731. Forty years later the House ordered that the Rolls Chapel should be fitted up with presses (the seats even being utilised), and a Rolls Chapel office be built next thereto.

**T**HE places viewed by the committee above-mentioned were about twenty-five in number: the principal being at Whitehall; the Chapter House and the Hall, Westminster; the Houses of Parliament; the Rolls Chapel; and the Tower. In the Tower had been appropriated the Wakefield Tower, "Cæsar's" Chapel in the Keep, with a gunpowder magazine immediately beneath, and for Chancery Records, the King's Treasury House, of which building we printed an illustration on August 7, 1886. Cromwell had brought all the Scottish public registers, rolls, and records to the Tower, where they remained until the Restoration; the vessel in which they were returned was lost, with its precious cargo, at sea. An Act, 1 and 2 Vict. c. 94, vested in the Master of the Rolls all public records at that time deposited wheresoever, to be brought under controul of a general Record Office; and the Treasury were directed to provide a suitable building for their safe custody. During the interval, 1850-70, votes in excess of 250,000† were taken *ad hoc*. On July 19, 1890, a Commission for Great Britain was set up, the "more effectually to provide for the better arrangement, preservation, and more convenient use" of our public records. The Commission, renewed from time to time,

\* Rebuilt, says Pennant, by Inigo Jones, in 1617, at a cost of 2,000.

† Thomas Allen's "History of London" says that nine of the houses here were rebuilt, after Colli Campbell's design, in 1719, by Sir Joseph Jekyll, Master of the Rolls, at a cost of from £5,000 to £8,000, and that Jekyll built thirty more.

expired at the end of the year 1837, having exceeded their "votes" by a sum of 24,000. Their report upon the condition of the papers themselves is but an echo of the grossness account of the Tower Records given by W. Prynn in his dedication, *temp.* Charles II., to vol. iv. of the Parliamentary Writs. In 1832 the Commissioners advocated the erection of a new central office on the Rolls Estate, the cost to be met out of the "Suitors' Fund"; a few years later the Treasury propounded a scheme for utilising the Victoria Tower and the roofs of the new Houses of Parliament, where Sir Charles Barry fitted up a small portion of the roof by way of experiment. In the end, a site was cleared for the present Record Office by Fetter-lane. The still incomplete designs of Sir James Pennethorne, architect to the Office of Works, were approved, and Lord Romilly laid the first stone on May 24, 1861.

**A** CORRESPONDENT writes: "I was at St. Albans this week, and was much struck with the difficulty that there must have been in setting-out the elaborate circular window of the north transept of the Abbey; but after much cogitation I found that the setting-out could be done to  $\frac{1}{2}$  in. scale for 1*l.* 18*s.* 4*d.* (which well represents the value of the design). Thus:—Take a penny piece, place around it nine threepenny pieces and around them again nine two-shilling pieces, and around them again eighteen shillings, and the job is done. This would give a good idea, too, for the stained glass design, and then the glass and tracery would suit very well."

**I**N describing the new Town-hall at Portsmouth, opened on Saturday last, the *Daily Chronicle* gives an interesting example of the architectural discrimination of the daily paper reporter. We read that "this beautiful work" is "what is vaguely called classic,—that is to say, it is Corinthian in the delicate details of its columns; it is Italian in general feeling, and it is Renaissance in some parts of its ornament." It would be interesting to know what ideas the writer of that sentence attaches to each of the three epithets he uses, and what he thinks is the relation of "Italian" to "Renaissance." In thus describing, in rapturous though somewhat blundering phraseology, "this beautiful building," the *Daily Chronicle* does not trouble itself to give the name of the architect who designed it; such matters of detail being, we presume, "of no public interest."

## Illustrations.

### BUILDINGS IN AND AROUND OXFORD.

**O**UR illustrations this week are in connexion with the Oxford excursion of the Architectural Association, which is taking place this week.

The view of the High-street by Mr. Falley-love we referred to in our article on Oxford last week. Sketches by Mr. T. MacLaren of the Bell Tower at New College and of the upper part of Magdalen Tower are now given.

The other plates illustrate the principal objects of interest in the vicinity, and should be taken in connexion with the leading article in the present number, in which also will be found some further views of places visited. A report of the progress of the excursion will be found on another page.

It ought to have been stated by us last week that the illustrations of new buildings at Oxford then published by us were taken from photographs by Messrs. Gillman & Co., St. Aldate's, Oxford.

**THE NEW CLOCK AT PORTSMOUTH TOWN HALL.**—The clock at the new Portsmouth Town Hall was made and fixed by Mr. J. W. Benson. It is a very powerful clock; in fact, it is stated to be only second to the great clock at Westminster. All the wheels are made of the finest gun-metal, the main wheels being 2*ft.* in diameter and 1*½* in. thick. The escapement is the "gravity," invented by Lord Grimthorpe, and similar to that in the great clock in the Houses of Parliament.

### THE GLOUCESTER CONGRESS OF THE ROYAL ARCHEOLOGICAL INSTITUTE.

THE Royal Archeological Institute of Great Britain and Ireland is holding its Congress this year at Gloucester, a city which it visited in its young days, namely in 1860. Its President for this year is Sir John Dorington, Bart., one of the members for a division of the county, and among its chief supporters are the Bishop and the Dean of Gloucester, the Lord-Lieutenant of the county, Lord Ducie, Lord Morston, Lord Eldon, and the usual number of local celebrities.

The Congress was opened on Tuesday at noon in the Corn Exchange of the city, in the presence of most of the persons above-mentioned, and of Mr. T. Robinson, M.P., Sir John Maclean, Sir Brook Kay, and Earl Percy, the permanent President of the Institute. The proceedings were commenced by a very brief speech by the Mayor of Gloucester, who was in the chair, and an address of welcome, duly signed and sealed with the seal of the Corporation, was read aloud by the Town-Clerk; this was followed by another address of welcome from the Bristol and Gloucestershire Archeological Society, which has now reached, as we gathered, its fourteenth year of existence, and very many of whose members were present.

Earl Percy then took the chair, and thanked the Mayor and Corporation for the very kind reception which they had accorded the Institute on that occasion. He proceeded to touch upon the objects of archeology, remarking that their investigations served to present difficult questions in new lights. The county generally appeared to be full of interesting antiquities, and, if he might judge from the programme before them for the present meeting, these were more numerous in the neighbourhood of Gloucester than most parts of the country. There were so many objects of interest in the immediate neighbourhood of Gloucester that they would hardly be able to visit them all, and it was well not to attempt to crowd too much work into a short time, and thus interfere with the enjoyment and instruction to be gained from those objects visited. He expressed, in conclusion, the thanks of the Institute towards the Gloucestershire and Bristol Society for the assistance they had afforded in promoting their convenience.

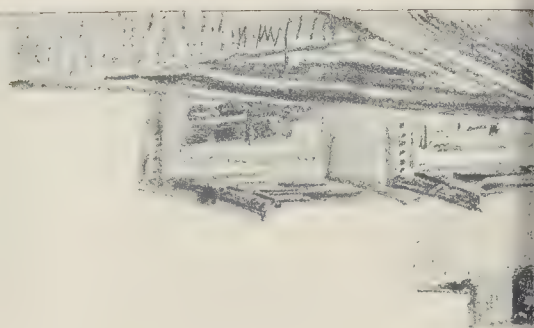
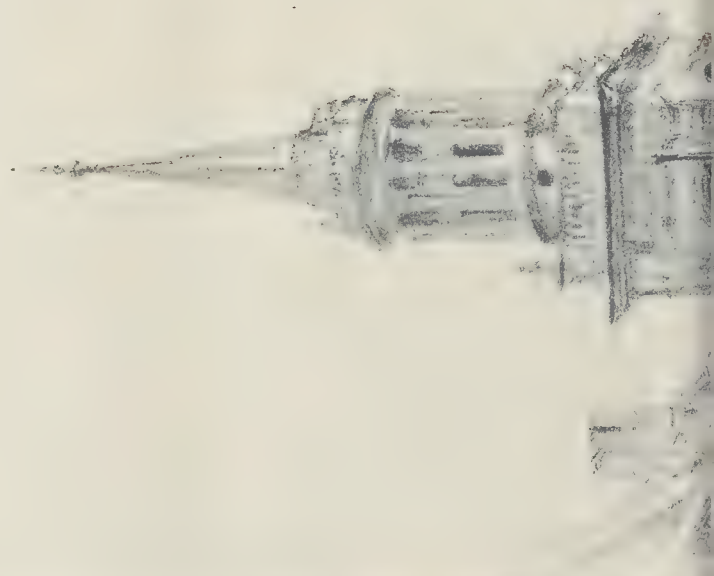
Sir John Dorington, as President of the Congress, next read his "inaugural address," which was a very able and exhaustive essay on archeology in general, and that of Gloucestershire in particular. He treated this, as was to be expected, chiefly with regard to its Roman remains. In these, he said, not only the city, but the country all around, is very rich, more rich in all probability than any portion of Great Britain of similar size; for it was the residence, even in the middle of the first century, of Aulus Plautius, the Emperor's great lieutenant, who was stationed here in command of several legions in order to hold this spot, the key of South Wales, against the Silures. There were known to be, he added, as many as twenty-four Roman villas in the county, and 112 Roman camps, to say nothing of nineteen distinct main roads, all made by these conquerors from the far south. He then dwelt in considerable detail, and at much length, on the conditions of life as it must have presented itself in Gloucestershire during the three or four centuries of Roman occupation, declaring his conviction, based on a careful study of what he had read and seen, but mainly on the latter, that society and civilisation were then in as forward a state as that in which we find them nowadays, with the exception, of course, of steam and other modern science; from that condition they fell, as he believed, mainly through the invasion of the Saxons; and the deterioration lasted down to the age of the Tudors, if not to that of the first of our Stuart kings. The archeologists would be shown, during the coming week, much that would astonish them in the way of Roman discoveries; for much had been brought to light in the last few years; and the collection of such relics to be seen in the local Museum would be a study for the most learned member of the Institute. He concluded by expressing a hope that the weather and the arrangements made by the local secretaries would conduce to the comfort of the party, and give general satisfaction in their results.

Lord Percy briefly proposed a vote of thanks to Sir John Dorington (whose address will appear in due course in the Journal of the





THE BUILDER, AUGUST 16, 1890



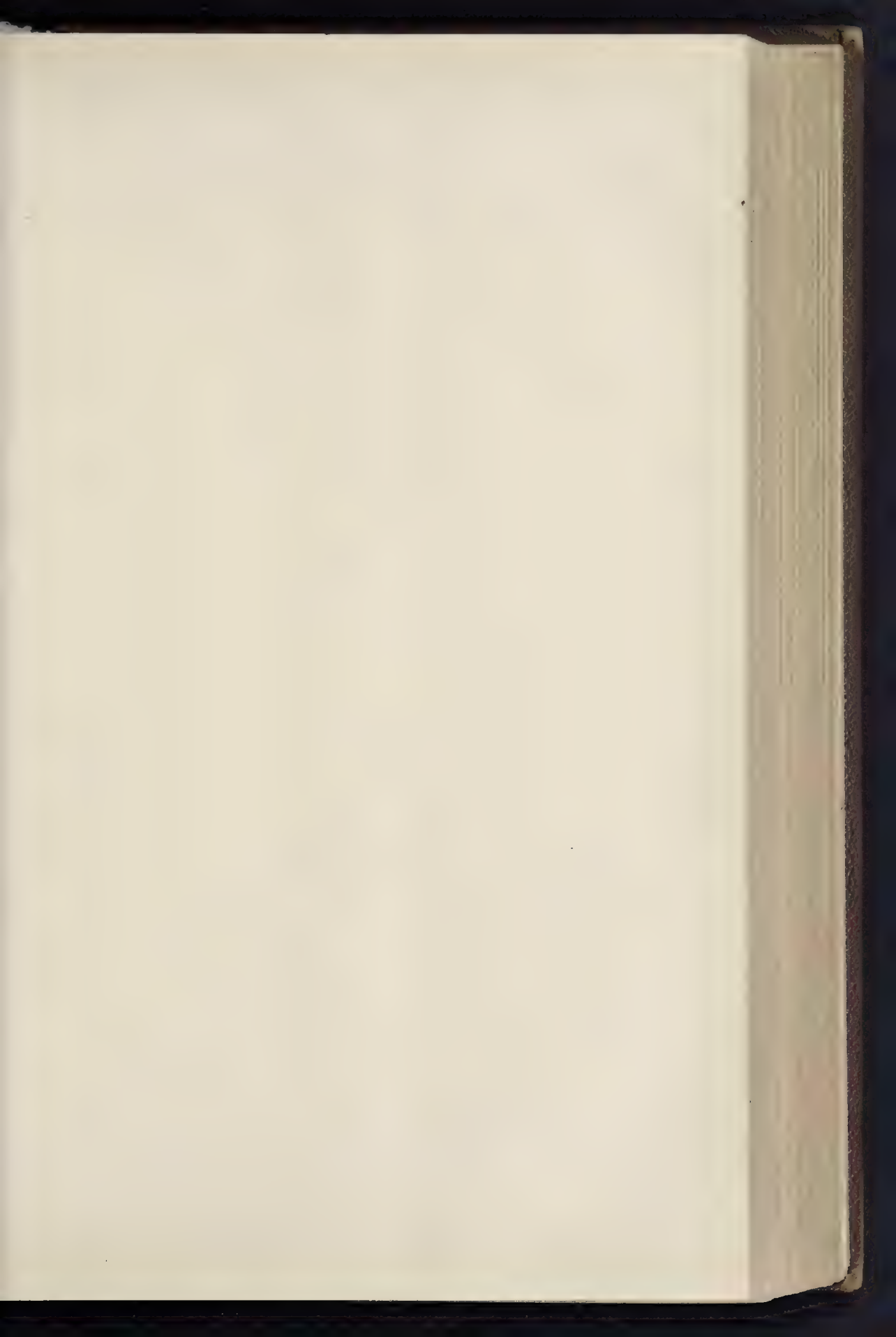


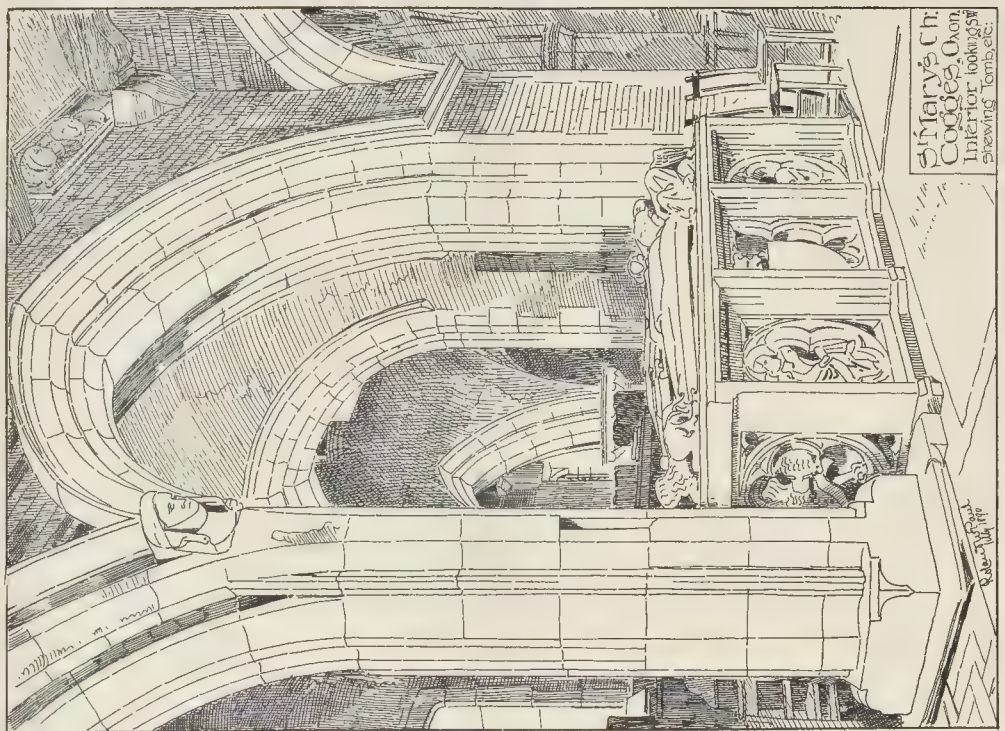
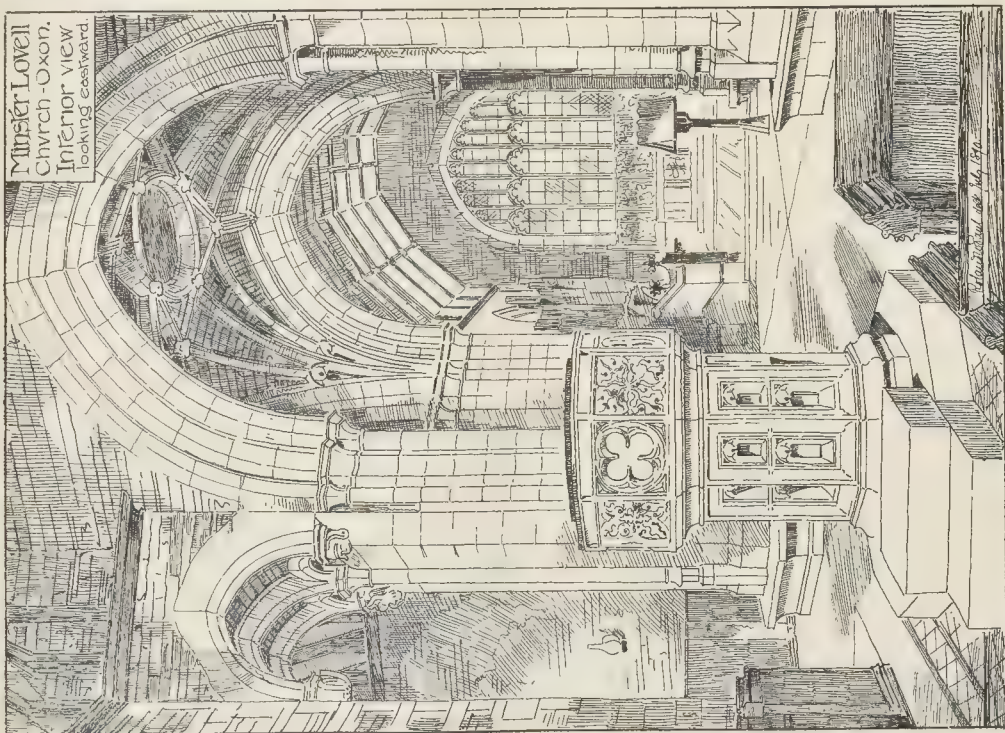


OXFORD: ALL SAINTS, HIGH STREET—FROM A DRAWING, BY MR. J. FULLEN.

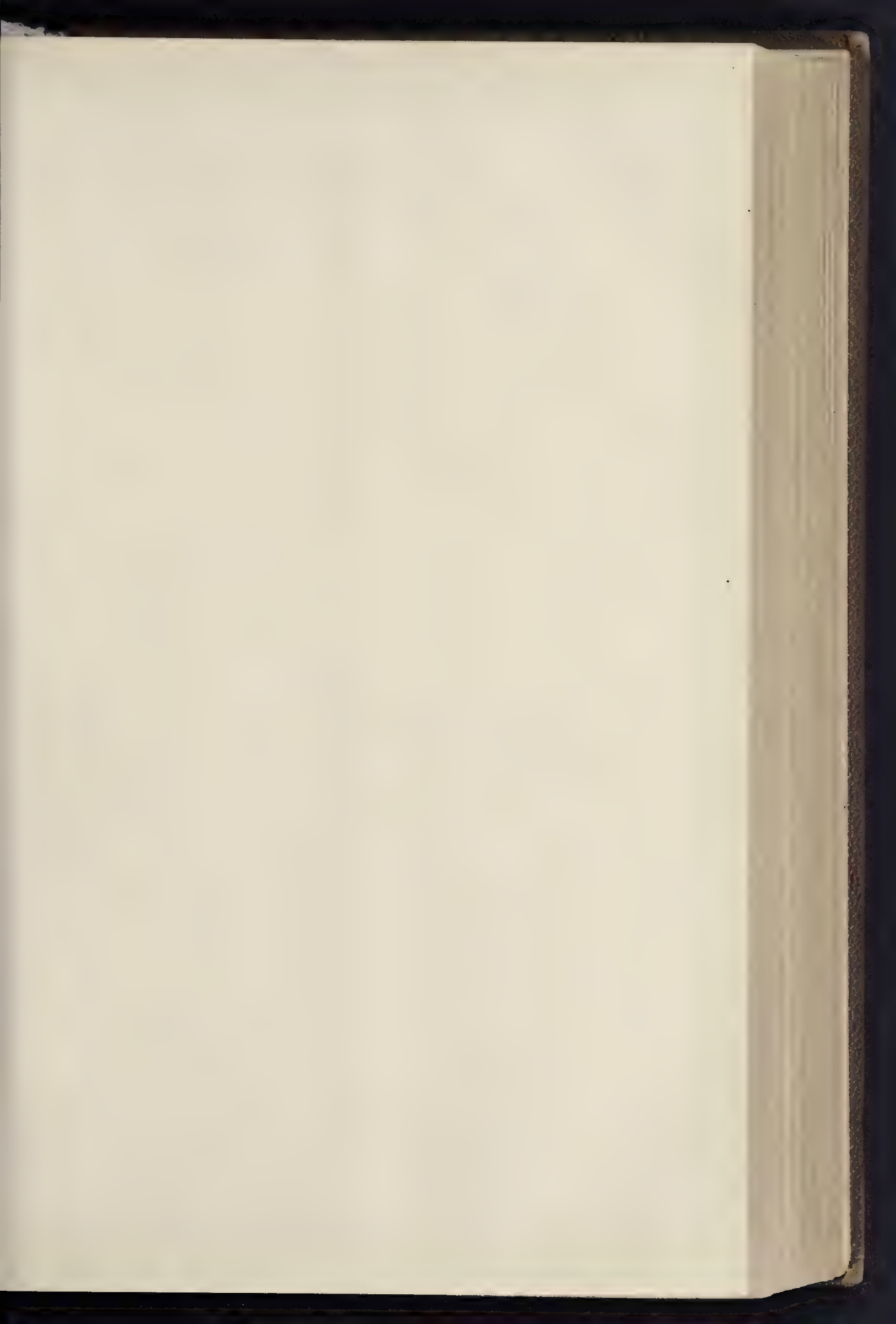




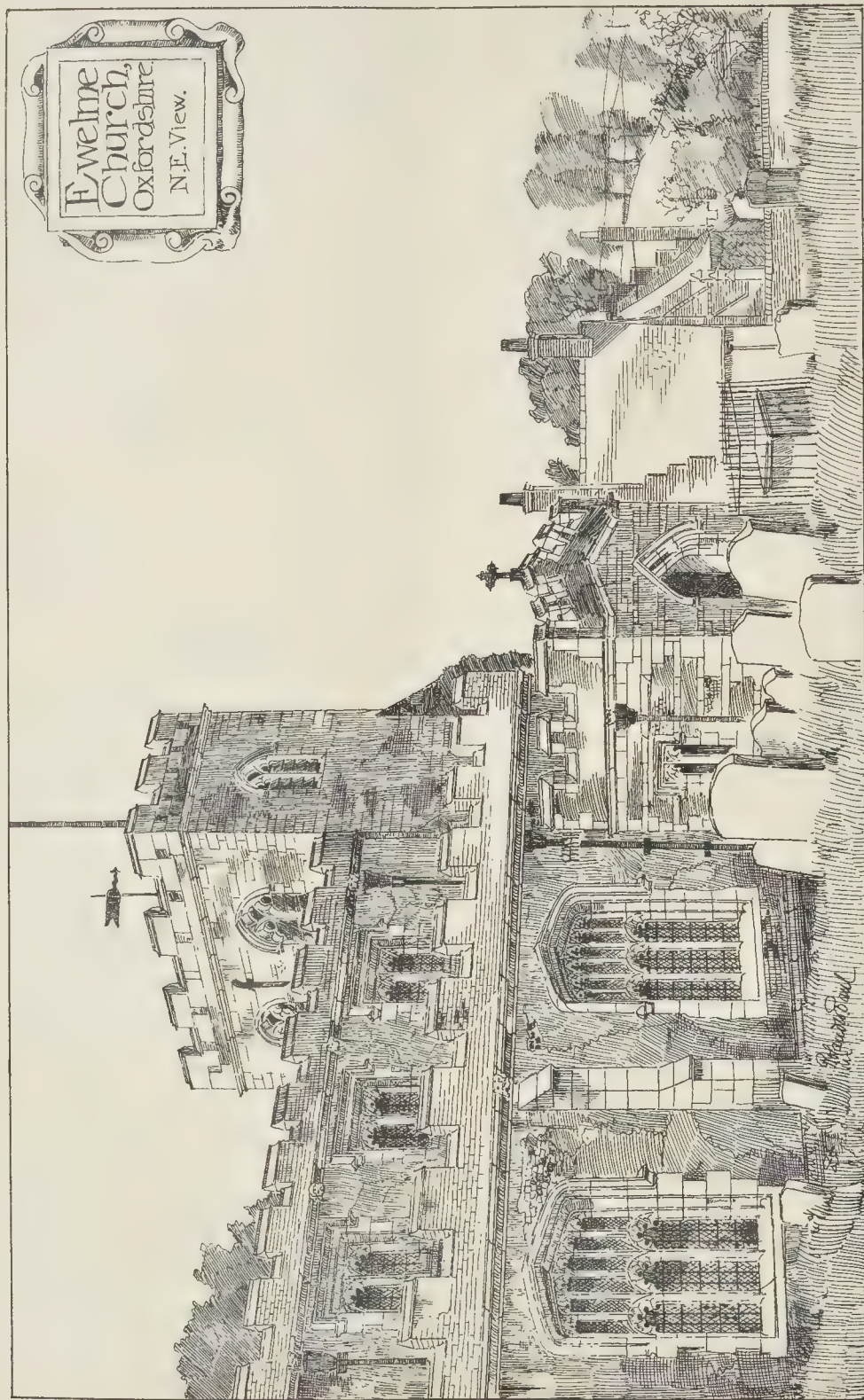






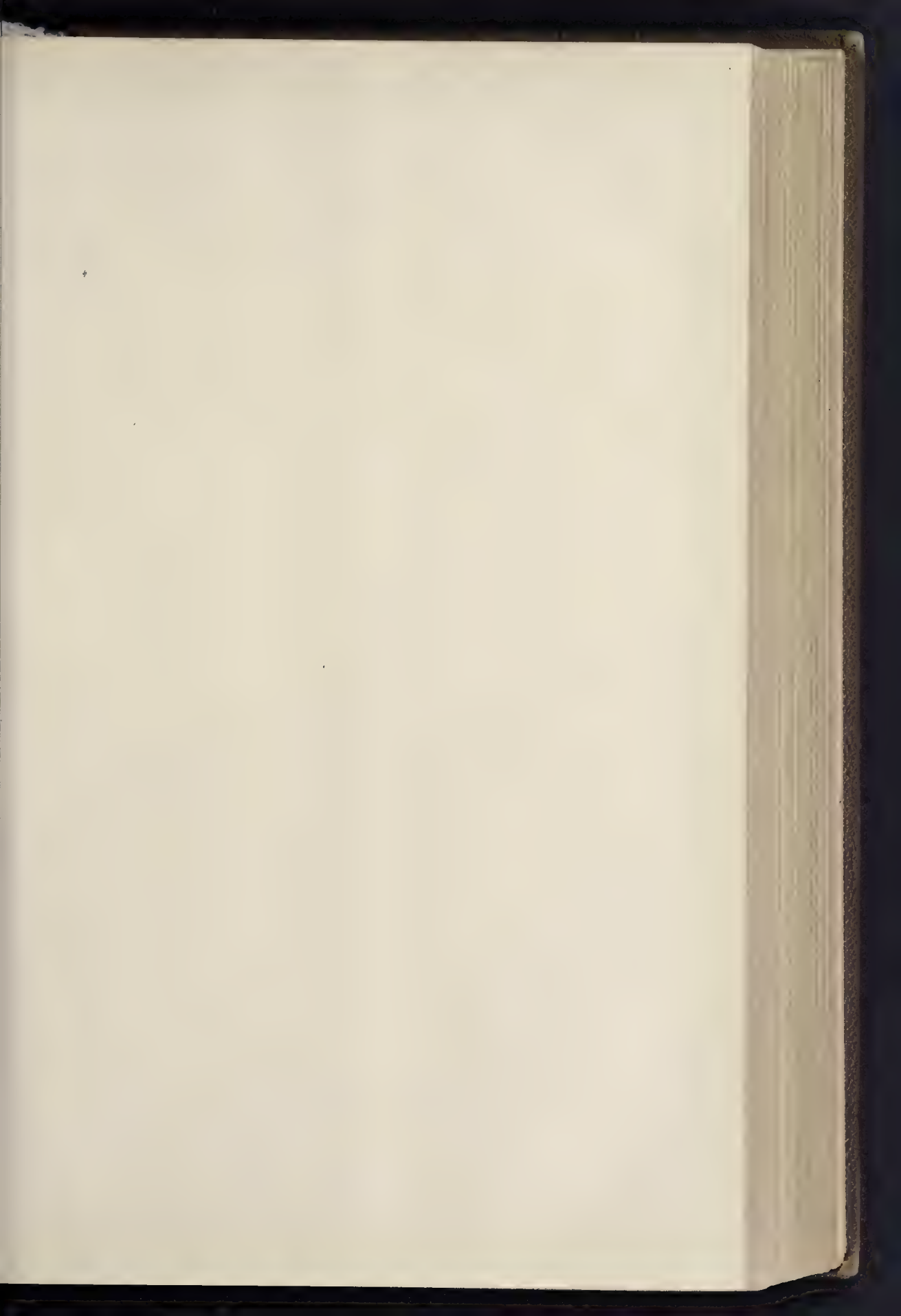


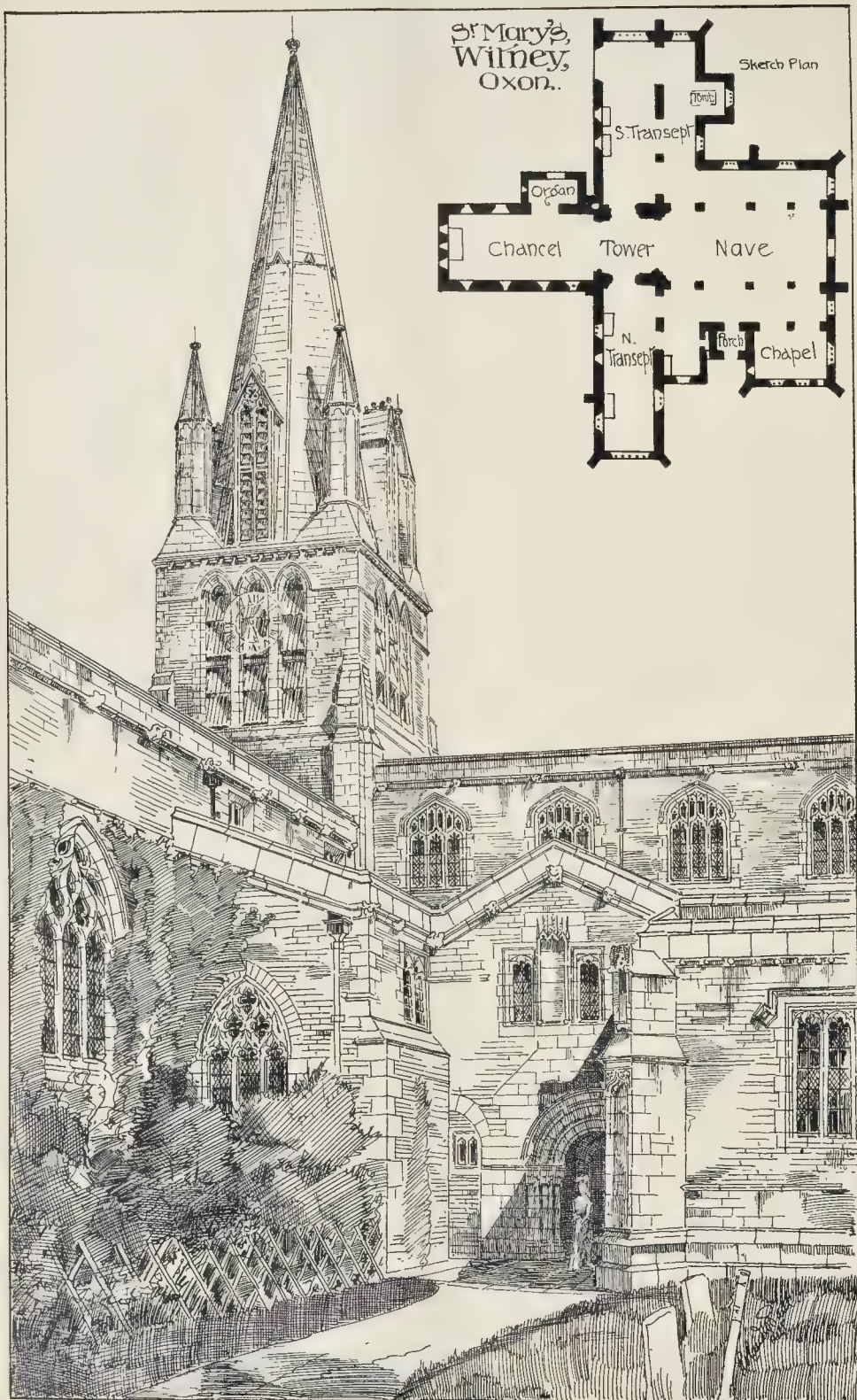
THE BUILDER, AUGUST 16, 1890.



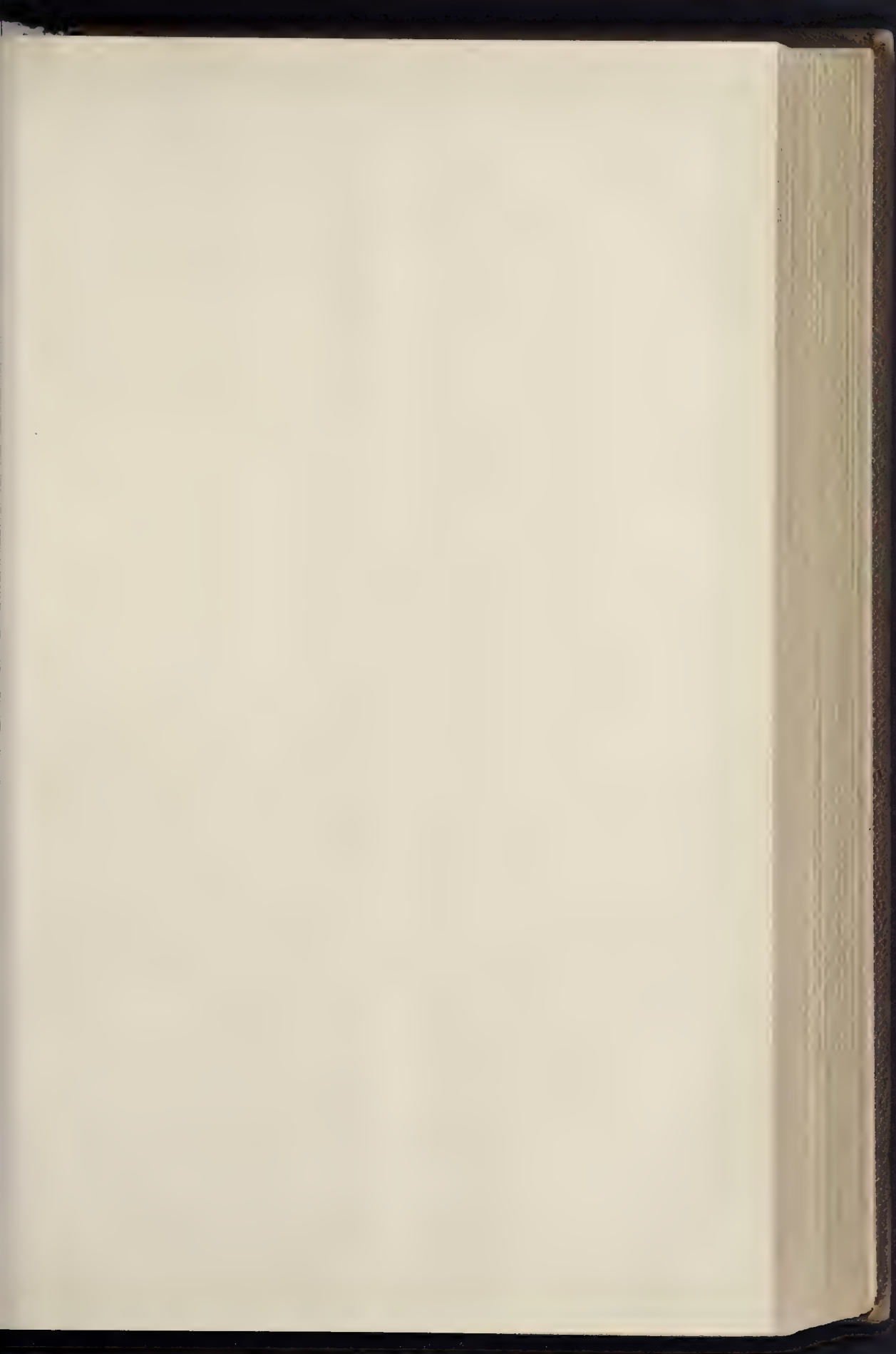
Ewelme  
Church,  
Oxfordshire.  
N.E. View.











Shrine of  
St. John the Baptist  
Church - Oxon.







Bell Tower  
New College, OXFORD

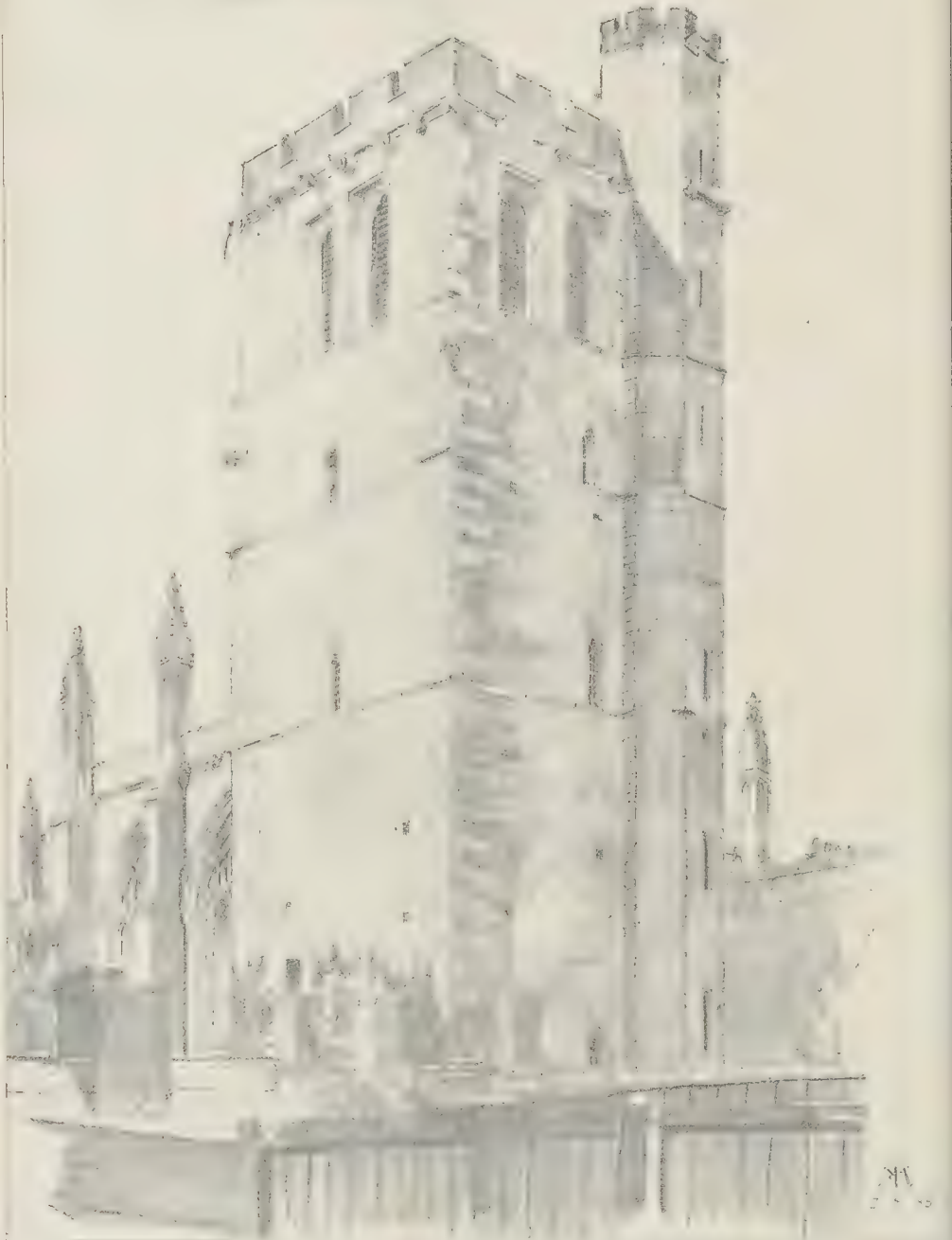


FIG. M. 3. DRAWING BY M. C. MCCLAREN





FROM A DRAWING BY MR. T. MACLAREN.



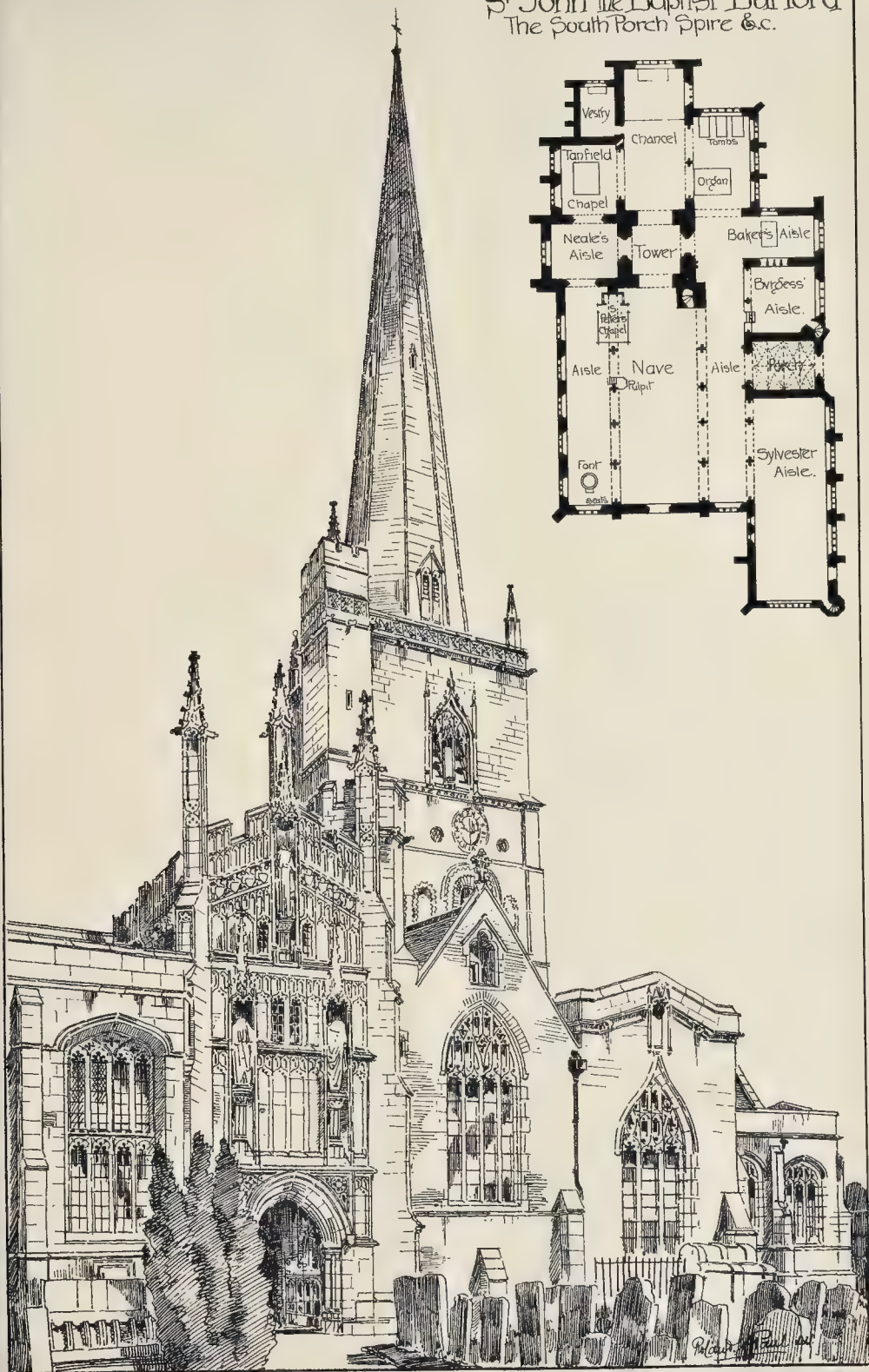








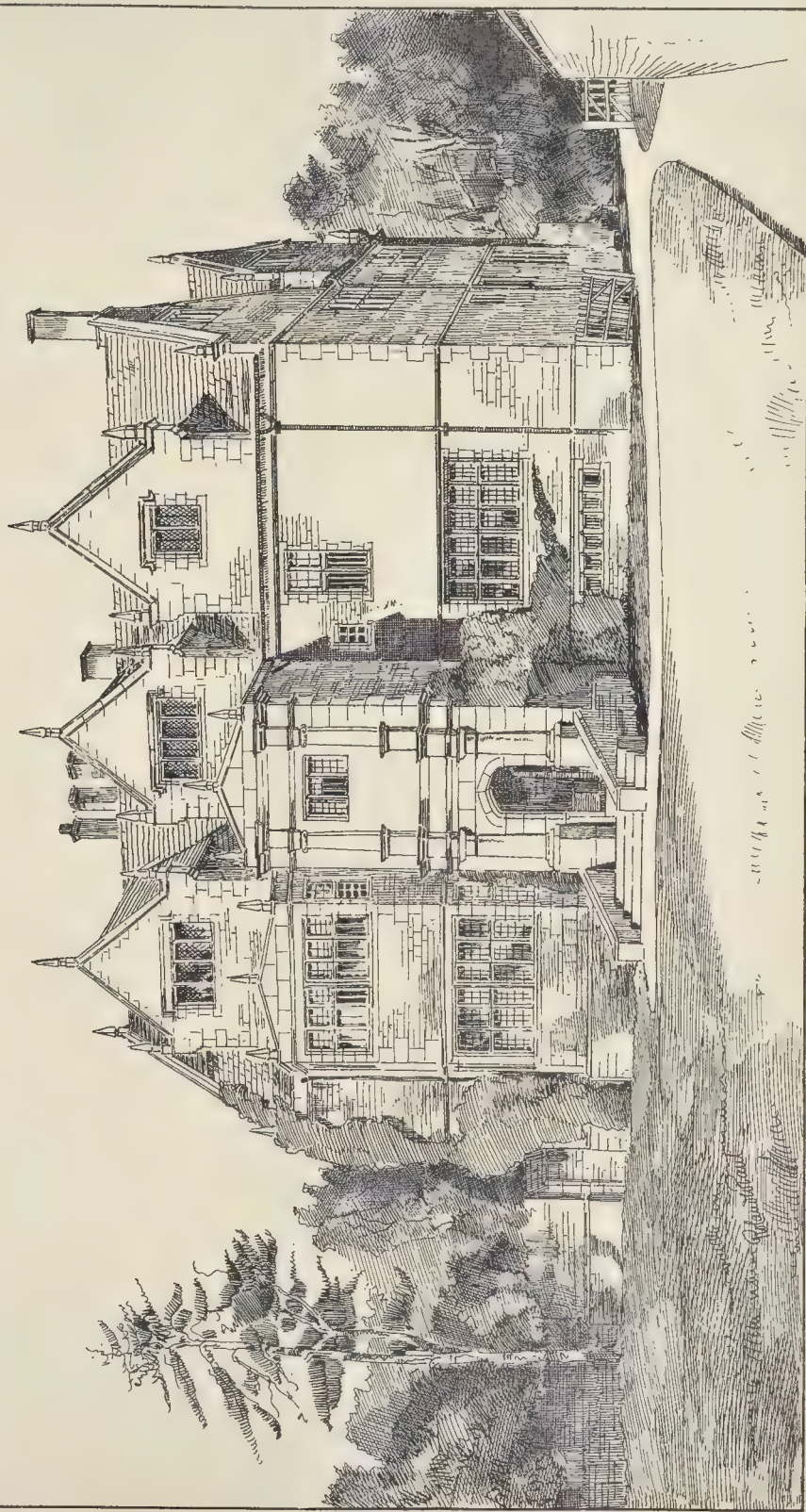
# St John the Baptist Burford The South Porch Spire &c.







Manor House, Water Eaton,  
Oxfordshire: East Front.

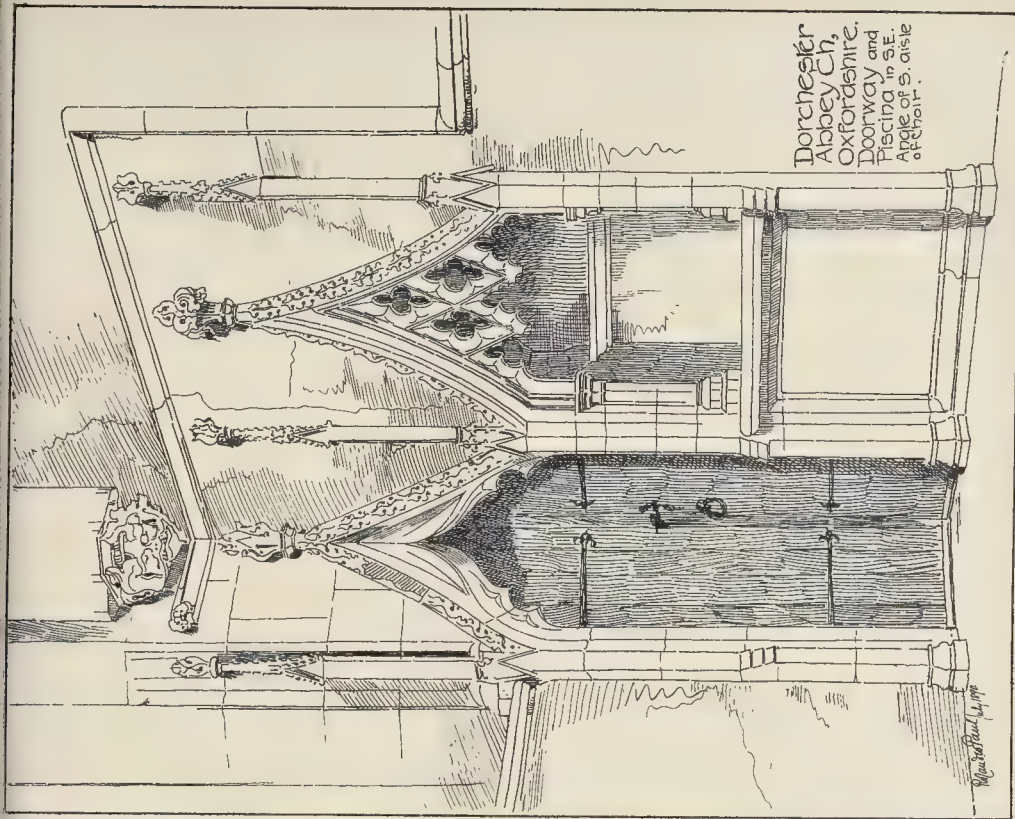








Tomb in Siltansep,  
Minsler Lovell  
Chvrch, Oxfordshire.



Dorchester  
Abbey Ch.,  
Oxfordshire.  
Doorway and  
Piscina in S.E.  
Angle of S. aisle  
of Choir.





Institute), adding that he had given the party plenty of subjects for discussion and argument during the whole of their visit to Gloucester.

An adjournment of an hour having been made for luncheon, the party met again at 2 p.m. at the local Museum, adjoining the School of Art, where Mr. John Bellows, who has made the remains of Roman work, especially in Gloucester, his special study, took one-half of them in hand, and conducted them to four or five different parts of the city where the ancient walls are to be seen or can be traced, explaining them in detail by the aid of a small diagram map of Roman Gloucester which he had made for the occasion. The chief places where he gave his explanations were on the site of the old South Gate, at the Castle ditch and the adjoining "Bare"-land, in the Cathedral-close, at the North Gate close to St. Aldate's-street, and at his own house in Eastgate-street. Here, under his dwelling-house and the adjoining printing works, Mr. Bellows has carried his researches into the ground under his cellars, and has within the last few months laid bare in two places the foundations and exterior facings of the old Roman wall built in the days of Plautius, on one of which are to be seen marks of tools similar to those seen in Jerusalem and at Cologne. He added that, in his opinion, Gloucester was originally fortified with a special view to check the incursions of the Silures; but that when the Romans pressed forward their conquering arms to Isca Silurum, Caerleon-on-Usk, the city gradually diminished in importance, and became in course of time a mere "Colonia" instead of the chief military port in the West of England. On this subject Mr. Bellows was able to give, before starting, a short lecture in the Art School Lecture-room, where he exhibited a series of most interesting maps and plans, drawn strictly to measure.

Meantime, the rest of the party, who had elected to inspect the ecclesiastical and mediaeval buildings of the city, were led by Mr. F. W. Waller, Mr. H. Medland, and the Rev. W. Bazeley, to the chief of the old houses and inns and parish churches in various parts of the city, including the "New" Inn,—which, curiously enough, is the oldest in Gloucester, in spite of its name, and one of the oldest in the Kingdom. It is built almost wholly of wood, and has open galleries running around a central court, like the London inns of Shakespeare's day. It was built by a priest, in the first half of the fifteenth century. They were also shown the Booth Hall, and the scanty remains of the once splendid fabrics of the White Friars and the Black Friars, the one to the east and the other to the west of Southgate-street. Both of these churches are now dwelling-rooms, and the old dormitory of one of the two religious houses is now a warehouse. The party also inspected the Church of St. Mary le Crypt, with its fine frescoes, font, and monuments, and went down into the undercroft from which the church derives its name, and which was kindly lit up for their inspection by the rector.

In the course of the afternoon, the entire party, to the number of 150, were entertained at the Palace by the Bishop and Mrs. Elliott, the Bishop and Mr. Bazeley giving a brief *visu* account of the building, including the great dining-hall, in which most probably William the Conqueror was feasted, and certainly many of his Norman successors were entertained.

In the evening the "Antiquarian Section" was opened in the lecture-room of the School of Art, by Dr. E. Freshfield, F.S.A., with a chatty and discursive paper on the present state of archaeological and antiquarian studies in Great Britain and in foreign lands, including Greece and Turkey. In concluding his paper he showed how easily subjects of study arise in any and every profession, and in any and every town and village; and he counselled those who wished to become antiquaries to lose no opportunity of following up such subjects.

The reading of this paper was followed by a discussion, in which Mr. Micklethwaite, Canon Venables, and other gentlemen took part, the Canon taking that opportunity of drawing attention to the fact that at Lincoln many important records relating to the city had been carelessly lost during the last thirty years.

Professor Burrows then read a paper on the Progress of Archaeology at Oxford in late years, in which he reviewed *seriatim* (1) the old Oxford Architectural Society, which was founded over half a century ago by the late Mr. J. H. Parker, and of which Professor Freeman was a leading member even whilst an undergraduate; (2) the

New Historical Society of Oxford; and (3) the recent appointment of a "Reader" in Archaeological Studies, which he hoped and believed at no distant day would bear good fruit. This paper also was followed by a brief discussion, in the course of which Mr. E. Walford stated that in his own day at Oxford (1841-1845) only one head of a college, and scarcely any fellow or tutor, took part in the meetings of the Architectural Society, but that the undergraduates not only believed in but supported it, showing their faith by their works, by subscribing the first hundred pounds raised towards the repairing of Dorchester Abbey Church, and the first hundred pounds also, as he believed, towards the repair of St. David's Cathedral.

On Wednesday the party started, soon after breakfast, by steamer for Deerhurst, where they had been promised a rich treat, and for Tewkesbury, where they had arranged to visit the battle-field and the celebrated Abbey, in which so many of the noble knights who fell there lie buried. The morning was fine, but at noon heavy showers came on, and the pleasure of the excursion was sadly marred. At Deerhurst the party—about 130 strong—was met by the Vicar—the Rev. George Butterworth—who led them to his church, which is one of the most curious in the whole kingdom, for it now stands but little altered—in its interior, at least—from what it was a thousand years ago, since it is clearly established that it was a flourishing abbey in the eighth century, and the walls of its nave and chancel are much older than the Norman Conquest. At a far more recent date—namely, in the first and second pointed periods—aisles were annexed to it, but without altering its interior structure. One of the most curious features of the church is its singular double tower, and another is a double window, of a very Early Romanesque type, which looks down into the nave and commands a view of the high altar. Mr. Butterworth here read to the party a short paper on this church and on the adjoining monastic buildings, some of which remain but little altered, and on the small Saxon chapel hard by, which, as our readers are aware, has lately been brought to light after having been for centuries embodied,—and, indeed, embedded,—in a modern dwelling-house, but which now has been carefully restored,—or rather repaired. Here Professor Middleton took up his parable where Mr. Butterworth had left off, and gave the party an interesting account of the structure and of its recent discovery. From Deerhurst they went on by steamer to Tewkesbury, in a most drizzling shower of rain.

We will continue our notes of the Congress in our next.

#### THE ARCHITECTURAL ASSOCIATION EXCURSION.

As our readers know, Oxford has this year been chosen as the locality for the annual excursion of the Architectural Association. As we have dealt pretty fully with the buildings visited in our leading articles of last week and this week, it is only necessary here to give a few notes as to the progress of the excursion.

It was determined that the morning of Monday last should be spent in visiting some of the more important buildings of Oxford, and accordingly a start was first made for Christ Church, where the Hall of the College, with its pictures and the interesting late example of fan vaulting to the staircase (date 1640) were inspected; then, after a glance at the kitchen, the Cathedral was visited, where the party remained till the time of service. After seeing the Chapter-house, the members proceeded to the Library, and thence to Merton College, where the Chapel, Library, and Hall were the points of attraction. Proceeding to the New Examination Schools it was found that these were in possession of the University Extension students, and the party therefore went on to Magdalen College, where the quad, Hall, Chapel, and the new buildings by Messrs. Bodley & Garner (illustrated by us last week) were examined. After this New College, with its Chapel and Hall, were visited, and then the well-known buildings and gardens of Wadham College. A return was then made to the Examination Schools (also illustrated by us last week), which were then thoroughly seen by as many of the members as were not tired of the personally-conducted system. After luncheon the members went, as fancy dictated, to the several parts which most attracted them

as sketching grounds, or, in some few instances, to the less serious pursuit of river scenery.

On the second day (Tuesday) the programme was rigidly adhered to, Ilfley with its Norman church, Dorchester, and the charming village of Ewelme (see illustration this week) being visited, and a fine day, and well-appointed four-horse coaches over good roads and through pretty scenery, raised the spirits of the members and conducted to a general feeling of satisfaction.

The third day of the excursion opened with beautiful weather and warm sunshine, which rendered the hour's drive to Stanton Harcourt (illustrated this week) a pleasure to all—less so, perhaps, to the bicyclist member, who found the roads not all that could be desired. At Stanton Harcourt, following the principle adopted generally in the programme of this excursion, a long stay was made, to the satisfaction of the water-colour artists in the party, who found the *locale* well adapted for their particular hobby. After luncheon the members proceeded to Witney, which was safely reached, although the near wheel of one of the coaches showed signs of impending collapse about a mile from the town. The rest at Witney, however, brought about his recovery, and no further signs of mishap occurred. At Witney the honorary amateur photographer seized the opportunity for a group of the party in front of the west door, after which, the church having been explained, and attention having been especially called to its salient points by a letter from the rector, the members dispersed to view in small parties the Grammar School, Market Hall, the Hermitage, an interesting house of 1564, and the neighbouring village of Cogges, where the church and the thirteenth-century Domestic windows, figured in Parker's "Domestic Architecture," attracted attention. A heavy shower here seemed to damp the enthusiasm of the sketchers, as very little work was done, in spite of the length of time allowed, the attractions of tea at the Golden Fleece appearing to have stronger power. On the return to Oxford a short halt was made at Eynsham, although it was not in the programme, for the sake of the horses, and the sketchers then set to work with vigour to make the most of the five minutes' halt. The return to Oxford was accomplished in good time, and the third day's work satisfactorily completed.

We will conclude our notes of the excursion next week.

#### GARGOYLES.

HOBACE WALFOLE, in his chapter entitled "State of Architecture to the end of the reign of Henry VIII.," refers to the researches of the French writer, Felibien, author of "Lives and Works of Celebrated Architects," who died in 1733, and of his father, André Felibien, author of "Les Principes de l'Architecture," who died in 1695. He says their researches had very small results. To them only two ancient architects revealed themselves. One was Sexulphus, abbot and afterwards bishop, who built a considerable monastery, called Medes Hampstead (Peterborough); and the other was Marcion of Arezzo, architect to Pope Innocent III., "who first invented those grotesque monsters and barbaresque faces with which the spouts and gutters of ancient buildings are adorned."

The Papacy of Innocent III. extended from 1198 to 1216. That gargoyles are not found on Mediaeval buildings of earlier date, however, is a statement that can hardly be accepted without demur; nor is it likely that any individual inventor can now be hit upon for such a class of detail.

When the choir of the Cathedral of Notre Dame was built neither spouts nor gargoyles were provided; but for other parts of the same edifice erected a little later, about A.D. 1210, arrangements were made to carry off rain waters by means of gutters placed at intervals. About 1220, a few gargoyles were placed upon the Cathedral of Laon. They were composed of two lengths of stone, one for the gutter and the other for the cover. Even at this early date they were fashioned into the form of fantastic animals. They were large in size and few in number. Subsequently architects preferred to divide the distribution of rain waters into smaller jets, and the number of gargoyles employed was lavishly increased. Eventually they became the objects of much sculptural decoration.

The term gargoyle, or gargouille, as it is written by our French neighbours, is said to be derived



from *gorgs*. Gargoyles are made to represent griffins and other beasts, birds, human figures holding ewers out of which the waters are directed to pour; grotesque and toad-like creatures, demons, fanciful birds with the heads of beasts, and, in late examples, the mouths of cannon. They are of much more frequent occurrence in some places than in others, and much more so, generally, in France than in our own country. Writing of French examples, M. Viollet-le-Duc says,—after mention of the prodigious variety in their forms and the fact that no two have been found to resemble each other in France—that many of them are fine works of sculpture, and are attached so adroitly to buildings as to bring out their salient points and conduce very much to their general effect.

In modern efforts they are often badly placed, and of heavy or poor form, poor invention, and no character; but the old architects and sculptors combined to make them real and pleasing. At first short and robust, they were subsequently elongated, and their heads so outstretched that the waters should be thrown as far as necessary from the foundations. They became veritable pieces of sculpture in the delicacy of their design and execution. The church of St. Urbain de Troyes has very fine examples, one of which is a human figure, elegantly draped, holding a vessel from which the waters issue. During the fourteenth century they were generally long, and often charged with details; and in the fifteenth took a strangely ferocious character; and it was not till the second half of the sixteenth century that these old forms were abandoned.

Our own examples occur most frequently on church towers, where they are placed below the parapets at intervals. They are for the most part small and simple. There are some grotesque specimens on the old tower of Stewkley Church, which are bold and striking. Others may be noticed, too, below the parapets of Badsworth Church, Gloucestershire, and on Fleet Church, Lincolnshire, and on Adlesthorpe Church tower and porch in the same county. They are to be seen on the topmost angles of the tower of St. Michael's Church, Aylsham, Norfolk. On the Church of St. Mary, Bishop's Lydeard, Somerset, they occur on the tower, on the porch, and below the parapet of the nave. Helpston Church, Northamptonshire, and All Saints' Church, Hawton, Notts, to give a few more instances, have examples, and the Church of St. Gregory, Bedale, Yorkshire, has some very bold specimens. On the nave of Morpeth Church, Northumberland, is a pleasing female figure holding a ewer from which the waters issue.

Some of our castellated buildings were also furnished with gargoyles. On the very interesting tower, known as Pope's Tower, at Stanton Harcourt, Oxfordshire, they occur, as well as on the church tower close by. On the fine entrance gateway of St. Cross, Winchester, they are placed at intervals. On a length of curtain-wall at Alnwick Castle they occur in the likeness of the mouths of cannon, and direct the rainfall on to the site of the old moat.

Kilpeck Church, down among the green pastures and gay orchards of Herefordshire, was one of the early works of the Norman masons. There are traces of Saxon handling in it likewise—in its tower especially. And among the sturdily lowly curves and the zigzag work, that are characteristic of its early period, may be seen some of these grotesque creations, very gaunt and noteworthy. As in other instances, scant notice has been taken of them hitherto, except, perhaps, by the few interested in the subject.

There are some gargoyles on the octagon of the fine tower of St. Bartholomew's Church, Lostwithiel, in Cornwall. They are but small, and are placed between the gables at the base of the spire. There are two examples along the parapet of the south of the nave of the fine old church at Minehead. But perhaps our most important specimens may be sought in work of the Perpendicular period, and especially in the Perpendicular towers of Somersetshire churches. They are not to be found in every instance in towers of this period and county, as witness Evercreech Church and St. James's Church, Taunton, but very frequently. They are specially to be noted on the grand tower of St. Mary Magdalene's, Taunton; on that of St. Mary, Bishop's Lydeard; St. Mary, Kington; St. Peter, Staple Fitzpaine; Banwell, and Hush Episcopi.

Among others mention may be made, too, of those on St. Michael's tower, Coventry, which overlook the bulging, subsiding, overhanging almshouses, the old and new shops, the venerable buildings of the ancient Corporation, with their crypt, halls, galleries, and courts, the narrow and wide streets, and look on other large churches, with interiors as lofty and light, and spires as proud, and all the other precious details of one of the most famous of our Medieval towns.

#### A SANITARY NOTE FROM GREENOCK.

FROM A CORRESPONDENT.

NOTWITHSTANDING much that is being written and done by those who take an active part in questions relating to sanitary matters and structural improvements, it is evident that the great mass of the people are still but feebly alive to the obligations they owe to one another regarding the laws of sanitation and health. It will be readily admitted that the health of the working-classes is their capital, and ought to be as carefully guarded as the property of the wealthy. Nevertheless, there are plenty of work-people who seemingly prefer to rear their families in unsanitary, dilapidated dwellings, rather than pay a slight increase of rent for a clean, healthy, modern habitation. This is more the result of their ignorance of the danger they run, than of any desire on their part to frustrate the good intentions of the sanitary engineer.

Still, with many of the poorer class, a low rent suitable to their indigent circumstances is the principal factor in determining their choice of a habitation. Some of the wealthier classes who are alive to the danger of occupying insanitary houses, might, with propriety, warn their poorer neighbours (with whom they occasionally come in contact) of the risk they run in not guarding against sanitary defects, and adopting preventive measures to ward off infectious disease. Some who give little consideration to the question, console themselves in the belief that their own dwellings are beyond the reach of the contaminating influence of the poorer districts. Let all who hold this opinion bear in mind that if, by failing to caution their less-informed and unsuspecting neighbours of the duty they owe to themselves and the public, an infectious disease is allowed to take hold and settle down in a poor locality, that disease will find its way into the districts of the wealthy, who will assuredly reap the reward of their reticence, in the sickness and probable bereavement of their own household. A very forcible instance of this is to be had from the town of Greenock, which twenty-five years ago was famed as being the most unhealthy town in Scotland. At that time its annual death-rate ranged from 34 to 36 per 1,000 of its inhabitants. The late Mr. James Drummond (when Burgh Assessor) turned his attention to this unsatisfactory state of matters, took it in hand as a labour of love, devoting his spare time to trying to discover the cause, with the view of removing, if possible, such a stigma from the town. He proceeded to divide the town into divisions, and each division into six districts, then tabulated the death-rate in each district, when, to his great surprise, the districts he expected to be the most healthy he found to be the most unhealthy. In 1871, Mr. Drummond issued a report of his past labours. His own words in reference to one of the districts will best explain how matters then stood. He says, "The death-rate of No. 6 district, however, seems to me to be higher than the general character of the locality would appear to warrant. Not only is the population in that district low, but the dwellings are, generally speaking, of an average class, many being of a superior kind. The district, too, lies considerably higher than the others of this division and is much more open, yet with all these advantages the average death-rate is one of the highest in town." Mr. Drummond intended to give an annual report, but unhappily he died before the date when his next report should have appeared. This investigation being no part of his official duties, and the mind of his successor not lying in that direction, this valuable inquiry has not been followed up. But any one who knows the locality and studies the report along with its accompanying map (which is divided into the districts referred to) can have no difficulty in tracing the close connexion that existed between the excessive death-rate and defective drainage,

trapping, ventilation, and the stinted supply of water given at that time for flushing purposes. District No. 6 referred to is the highest part of the town, with much open space and modern tenements, constructed professedly on sanitary principles. From the low-lying districts on which stood many insanitary dilapidated tenements, densely populated by the poorer classes, there is a thoroughfare leading to No. 6 district; in it there is a main sewer that receives the drainage of the upper district. Many of the drains, and even the main sewer in the lower district, were no better than elongated cess-pools, the gases generated from their decomposition contents being conveyed from the lower to the No. 6 district along this main sewer, which had no provision for ventilation at its upper extremity, so that these gases found their way into the streets and houses through defective traps and bad connexions, resulting in the excessive death-rate of that district. Mr. Drummond's report had the effect of bringing about a better state of things. Shortly after it appeared the Local Authority adopted the Artisans' Dwellings Act, purchased and demolished many of the old dilapidated dwellings inhabited by the poorer classes, paid greater attention to drainage, and allowed a more plentiful supply of water than formerly, with the result that Greenock now ranks as the most healthy town in Scotland. Its annual death-rate for several years past has not exceeded from 16 to 17 per 1,000 of its population, instead of from 34 to 36 twenty-five years ago.

Much yet remains to be done to reduce the death-rate, particularly amongst children. A recent number of the *Sanitary Journal* reports that of the eight principal towns of Scotland the death-rate in Glasgow was the highest, being 24 per 1,000 of its inhabitants, while in Greenock it was lowest, being 17 per 1,000; and of the total deaths in Glasgow 45 per cent. occurred among children under five years of age, while in Greenock the deaths under five years were 41 per cent. It is most alarming to find the death-rate amongst children highest in the city of Glasgow and in Greenock, where in both places more is being done in the way of sanitary reform and structural improvements than in any other town in Scotland. There is certainly some preventable cause at work that requires special attention, and until that cause is discovered and mastered the fact that nearly half of the human beings born in these cities sicken and die before reaching the fifth year of their age will stand as a reproach on the reputation of our good-intentioned sanitary reformers.

There are without doubt various causes for this great infantile mortality, but I fear that the draining and trapping of our dwellings as practised in Glasgow, and now being demanded by the Sanitary Department in Greenock, has more to do with it than is generally supposed.

Some time ago an attempt was made through the local press to point out this danger and to draw attention to the desirability of making it compulsory to have all new drains constructed by certificated or skilled workmen, so as to make sure of having sound connexions, good joints, and a proper declivity towards the main sewer; also to have all air openings to or from traps and drains, carried up to the main roof instead of discharging on to the footpaths or back courts as done at present in Glasgow and Greenock. This idea was most vigorously opposed by local builders and others interested in trap patents. Some of the former honestly confessed to the writer that if drains were constructed as proposed, no repair would be required, and their trade would suffer. Owing to the depressed state of the building trade for two years past, the requirements of the sanitary inspectors to have defective drains rectified formed their chief source of employment.

In the *Builder* of May 17 last there is a short report of an excellent paper read to the Association of Public Sanitary Inspectors at Carpenters' Hall, by Mr. Thomas Lowther, of Bristol. On the question of drainage and trapping of modern houses, he is most decided, and points as clearly to some of the defects here referred to, as though his attention had been specially directed to them. Referring to the construction of drains, he says:—"Even where such work was entrusted to professional sanitary engineers, satisfactory results were not always obtained; for generally some local builder, possessing perhaps but little knowledge of this particular branch of sanitary work, was called upon to do it." Referring to the ventilation of traps and soil-pipes, he states that "fresh air inlets should be carried above



the main roof, and to assist ventilation power-fan exhaust cowls should always be fixed on outlet vent-pipes." With regard to intercepting traps, he says, "where placed at the foot of each soil-pipe, the air inlets are generally fixed right over them. Such a system was subject to serious defects, and in his opinion should not be applied to private dwellings."

In Hellyer's work on "Plumbing and Sanitary Houses," page 169, referring to the ventilation of traps, he says, "If there is much traffic near the induit pipe, it should be taken 15 ft. or more above the ground level, so as to prevent any one inhaling the air that would be sent through the pipe when any of the water-closets were in action." At page 276 he again states distinctly that induit pipes for the admission of fresh air into drains or traps should be at a point well removed from the house, so as to be at a distance from windows, doors, or passenger traffic, so as to lessen the risk of catching contagious diseases,—that is, and what not,—from disease germs coming from the stools of an infected patient. The very reverse of what is here recommended to be avoided as dangerous to health is practised in Glasgow and now being enforced in Greenock. The branch drain to every new property has a disconnecting ventilating trap, generally placed in the foot-path, and directly over it is an iron plate, in which are from fifty to one hundred half-inch holes. The avowed intention of this perforated plate is to admit a down current of fresh air to ventilate the house-drain and soil-pipe. This it will probably do, as long as the closets on the soil-pipe are not in use; but whenever a closet or bath is put in action, the discharge from it descending the soil-pipe acts like a plug or piston and ejects through the perforated plate on to the footpath a volume of foul air and gas, and, it may be, disease germs, to the great danger of passers, and particularly to children, who, in fine weather gather round these plates and use them for playing at their little games.

There are some very suspicious intercepting traps that are being strongly recommended by our good-intentioned sanitary officials. These gentlemen are no doubt doing good work, and have strong claims on our sympathy and support in the many difficult and thankless duties they are called on to perform. Still, much of the good they are doing is being neutralised by their present system of ventilating and trapping of drains and soil-pipes.

I can assure your readers that this is no mere fancy. The writer has tested several properties, two of them very recently, within two days after the drains and traps had been executed to the satisfaction of the Sanitary Inspector, and the result has been as here stated.

Enough has been said to draw the attention of parents to the great danger to which their children are exposed by this erroneous system.

Were those who are interested in this matter to lay aside all prejudices and to take an intelligent and practical view of the question, they could scarcely fail to see it to be their duty to insist on such a change as would tend to preserve the health and save the lives of many children. X. Y.

## Books.

*Excursions Archéologiques en Grèce. Mycènes, Délos, Athènes, Éleusis, Épidaure, Dodone, Tirynthe, Tanagra.* Par CH. DIEHL. Avec huit plans. (Armand Colin & Cie, Paris.)

WE have often heard the wish expressed that some one would write a book which should give briefly, and, above all, readably, the main results of recent excavations. Here is the book, in French, and written with that easy lucidity seldom attained by any but a Frenchman. M. Diehl says in his bright preface that he lays no claim to profound erudition or to originality of view in his book; the reader is to look for,—and will certainly find,—the simple statement, made as fully and as clearly as possible, of the great discoveries that classical archaeology has made in Greece during recent years. The results of these discoveries have hitherto for the most part remained the exclusive property of the learned specialist and specialist, specially as archaeology loves to look up its treasures in splendid but bulky folios or to scatter them to the four winds in the pages of a dozen or more learned periodicals; hide them as best she may—they will not

escape she knows the searching gaze of the initiated. As to the profane vulgus, she either despises or, at best, ignores their curiosity; and, as a matter of fact, fails to awaken it; yet the material she has at hand is such that, if treated, it would arouse their interest." The book is light and interesting reading at home, it will probably be widely used by travellers abroad. It just gives the background—the historical background that cannot fairly be expected from Murray and Baedeker. It puts in the simplest possible form, with an ingenious elimination of vexatious detail just what a fairly intelligent traveller would like to have in his mind when he visits Olympia, Mycenæ, &c., and what he might hope actually to remember when he got home. Moreover, each chapter is headed by a really admirable bibliography, so that the reader may know the sources of the vast mass of information that has been boiled down for his benefit, and may also have at hand material if he cares to study the subject seriously.

*The Gentleman's Magazine Library.* Being a classified collection of the chief contents of the *Gentleman's Magazine* from 1731 to 1808. Edited by LAURENCE GOMME, F.S.A. Architectural Antiquities: Part I. London: Elliot Stock. 1890.

THIS portion of the reprints from the *Gentleman's Magazine* forms a curious and interesting volume, the chief practical value of which at the present moment is in the record it gives of the state and condition of a number of our architectural monuments at the close of the last and the early part of the present century. In this sense it forms a historical record from which to measure the extent of work done in restoration since the time it was written. As the editor says, "The details are extremely important, because they consist of descriptions written from actual surveys of the various buildings." The papers forming this series were published in the *Gentleman's Magazine* under the signature "An Architect," but were pretty well known and subsequently acknowledged to be the work of John Carter.

The higher interest of this volume consists in the evidence it affords of history repeating itself; of the existence of the self-complacent restorer and the conscientious objector side by side a hundred years back, just as they are now. From a literary point of view Carter's writing is certainly not a model; his English style is slipshod and even ungrammatical to a degree; but "his meaning is good," and his perception that there was more in Gothic architecture than his contemporaries were aware of is shown in a manner highly creditable to his architectural insight and enthusiasm. In this respect, indeed, he was in his generation as the voice of one crying in the wilderness.

Carter's classification of Mediæval remains, though not without method, was on a system very different from that now accepted. He went not by dates, even when known or reputed, but by style and character. Thus, what we now call Norman he calls Saxon, applying that phrase to all the Mediæval architecture of this country previous to the introduction of the pointed arch. He was evidently aware that many of the buildings so classified were not really built by the Saxons, but he claims that they belong to that style, and that in his system of nomenclature he is only following out the same principle as in the nomenclature of classical buildings. "Is it not a general observation when a building is raised in our own time to say it is either Grecian (example, east front of Covent-garden Theatre) or Roman (example, east front of Covent Church), &c.?" As for classification of later periods of Gothic, those were refinements that waited for the hand of Rickman.

In his enthusiasm for Mediæval architecture, the contributor to the *Gentleman's Magazine* was quite in advance of his age; but his notions of the manner of displaying that enthusiasm are, if put into plain English, such as would be violently scouted in the present day by the very people who are so earnest to bring his views before the notice of modern readers. For the book is brought out and edited in an "S. P. A. B." spirit throughout. It is intended to show that here, nearly a century ago, was a pure-minded "Anti-scrape" protesting against restoration and the alteration of ancient buildings. And so Carter, according to his lights, was actually doing so; but alas! how partial were those lights. For, from a passage on page 114,

it is evident that Carter was by no means indignant at the imitation of ancient Gothic *per se*, but only at the bad and imperfect imitation practised in his day:—

"I define imitation to be the copying of any of those objects, so as to be enabled to realise their forms in some projected pile about to be erected, and we follow the arrangement, imitate the doorways, windows, buttresses, and every other peculiarity, that distinguishes the original under our survey; then will our rising walls meet the comparative eye, the work will become of consequence from its historic reference, and continue an example of genuine taste and true imitation. Thus alone can the word 'imitation' be properly understood by the real admirers of our ancient architecture. . . . Yet of those patrons who deceive themselves and the world by their false imitations, they are most abundant. Their ideas of imitation are to substitute fancy designs for true copies; their restorations of decaying or mutilated structures is (sic) destroying them in part, and disguising their remaining lines with strange decorations that can in no wise suit but with theatrical boards or convivial domes."

Evidently Carter thought that the true virtue of imitation of Mediæval architecture consisted in exact and truthful reproduction; he was a predecessor, in fact, of Scott, in theory though not in practice. But it is certainly amusing to read the sentence we have italicised above, and to reflect that this reprint is brought out (obviously, from remarks in the preface) as an example of the development of the "S. P. A. B." spirit in a previous generation! The editorial intellect must have been nodding, surely, to have passed that passage without a comment.

Carter's criticisms on Wren's criticisms on old St. Paul's are delightful, and perhaps it is difficult to say whether he or Wren showed the most bigotry or want of power of looking at two sides of an architectural question, though perhaps it may be admitted that Wren does best, with his summing-up of the Gothic cathedrals as "mountains of stone; vast and gigantic buildings indeed, but not worthy the name of architecture." Carter is reasonably indignant at this; but then he is just as indignant at Wren for saying that the dangerous state of Salisbury Cathedral arose "from want of true judgment in the first architect"; which is no more than the plain and obvious truth.

In his remarks on proposed alterations to Magdalen College, Carter anticipates Mr. Lang, the modern historian of Oxford, in his objection to schemes for new buildings:—

"Magdalen College! to thy guardians I now call with another warning voice. Do ye wish to build, lack ye more habitations, sigh ye for modern halls, saloons, drawing-rooms! . . . Ye assure us that your intended pile is to be entirely unconnected with, and in no way trenching on any one stone of, your present buildings; yet forbear to begin the same without well considering the propriety of the plans and elevations, in their pretences to be correct 'imitations' of those architectural monuments which you now call your own. Trust not professional men in this respect,—nursed in the prejudices of the 'heaven school' of constructing edifices; their bigotry for foreign modes will not let them, of their own wills, be true to the ancient architecture of their native land."

In another reference to Oxford, Carter, in relation to St. Mary's Church, says "The most remarkable innovation is the grotesque porch"—that porch which architects vie with each other in praising and in sketching now. Had Carter had his own way, we can have no doubt he would have removed it and set up a correct "imitation" of the original porch; the very thing which the editor and the annotator of the book would have been ready to laugh to scorn if proposed at the present moment: such is the consistency of antiquarian critics.

One of the best bits in the book is the description of the alterations that were being made in a window in Windsor Castle chapel, where the tracery had been removed and a new nondescript design, with much wider lights, "and a number of turns after a new way," had been introduced, which he was told was to be a substitute for the multifarious lines of the old windows. "I answered, 'but do not these said multifarious lines correspond with the general design of the whole chapel? I was thus replied to: 'That is nothing; the celebrated painter who has been given his sketch must have a large field whereon to display his abilities.'" On farther remonstrating, he was told there was no manner of doubt that what was now being done would be recognised as an improvement of the highest importance so,



adds Carter, "I consoled myself with sketching the east window."

The book is a most curious repository of notes of the former state of many famous buildings, as well as an interesting record of the feeling and opinions of a past generation. It was quite worth reprinting, and we have quoted enough to show that, in addition to its historical interest, when rightly read, as Lamb stammeringly observed of Coleridge's preachments, it is "f-f-full of f-f-fun," though in a sense perhaps not quite contemplated by the ingenious editor.

### Correspondence.

To the Editor of THE BUILDER.

#### "TENDERS FOR PROFESSIONAL SERVICES."

SIR,—Your "reliable" correspondent on the subject of "Tenders for Professional Services" (see p. 106, ante) can scarcely be said to have accurately stated the case so far as I am concerned. I enclose copy of the letter sent me by the Clerk to the Guardians, and as I am well known professionally in West Ham, where I am largely employed in Board School work, there was nothing to suggest to me competition in regard to fees. Had there been any such intimation, I should have declined to have had anything to do with it.

J. T. NEWMAN, F.R.I.B.A.  
2, Fen-court, Fenchurch-street, Aug. 12.

[COPY]

"Union Workhouse, Leytonstone, E.,  
July 21, 1890.

DEAR SIR,—The Guardians propose erecting new school buildings at Forest House, Leytonstone, to accommodate 300 children, together with the necessary administrative buildings, and I am to ask you kindly to favour them with your inclusive terms for preparing plans and acting as architect in the matter.

I shall be glad to receive this information by Wednesday next.

(Signed) FRED. E. HILLBARY,  
Clerk to the Board."

#### "THE BERMONDSEY PUBLIC LIBRARY COMPETITION."

SIR,—In common, I think, with all the other competitors in this competition, I am glad to find from Mr. Elkington's letter, in your last issue (p. 110), that he is not responsible for the awards that have been made, in direct violation of the contract entered into with all the competitors, and to learn that the Vestry have not yet given consent for windows to be opened overlooking their property; and we may still further gather that the Commissioners were fully aware of this restriction as to rights of lighting and of the consequences of the competition. We are now able to fix, without any doubt whatever, the whole responsibility for this miscarriage of justice upon the Commissioners themselves, who have awarded the first and fourth premiums to designs which directly violate the conditions approved by them and issued under their sanction. I cannot conceive a clearer case of injustice. All who entered into the competition did so, I suppose, on the understanding that the contract between themselves and the Commissioners would be honourably kept to, and those who ventured to solve the problem of lighting by the simple expedient of putting windows where they were told no windows must be put, did so at the risk of wasting their time, and must have been as much surprised as any one to find that the Commissioners gave their approval to a direct violation of their own conditions.

In this flagrant case the conditions, on the face of them fair and equitable, are not acted upon; the advice of their own skilled assessor is ignored by the Commissioners; and the awards are made without knowing apparently whether the Vestry will grant a right of lighting. I hope they will show their sense of the conduct of the Commissioners by refusing the permission.

An explanation of the awards must now come from the Commissioners. I challenge them to give it.

COLE A. ADAMS.

ARTESIAN BORED TUBE WELLS.—We learn that Messrs. C. Isler & Co., of London, have completed artesian bored tube wells on their improved principle at the Kirkstall Brewery Company, Limited, Leeds, where, for some time past, the supply has all but failed from the existing dug well. After reaching the depth of 160 ft. from the surface, springs were struck yielding 6,000 gallons water per hour without reducing the head of water. Similar results are obtained at Mr. J. W. Wright's brewery, Armley, Leeds. At Messrs. J. C. & J. Field's, London, a continuous supply of over 7,000 gallons per hour is obtained from an artesian bored tube well 404 ft. deep.

### The Student's Column.

#### HOT-WATER SUPPLY.—VII.

THE TANK SYSTEM: continued.

THE flow-pipe, as already said, is taken from the highest point in the boiler, and it is continued from there to the tank and connected about half or three-fourths the way up it. This pipe should nowhere be permitted to travel in a downward direction; if possible it should be kept gently rising all the way, but more often than not this is impossible, and the pipes that are not fixed vertically have to be carried horizontally, as along passages, beneath floors, &c. There is no positive objection to the pipes being carried horizontally, though it sometimes occasions a check in the circulation, and it is always best if possible to have the pipe more or less on a rising gradient in every part of its length.

There are many conflicting notions as to whereabouts in the tank the flow-pipe should enter. All are of opinion, of course, that it should be somewhere above the return-pipe; but beyond this there is no universally-agreed position. Some contend that the flow should be immediately above the return, with not more than 3 in. space between the two; others consider it should enter at least three-fourths the way up the tank; and there are various other opinions on the subject. There is not the least doubt that the flow-pipe should terminate about 6 or 8 in. from the top of the tank, for, in the first place, we have to remember that if the quantity of hot water be ever so small it will be found at the top of the tank (when once it has had time to reach the top of the house); and secondly, and more important, all the draw-off services are taken from this pipe, and as water proceeds both up and down the flow-pipe when a tap is opened (as will be shown more fully presently), it would be bad policy to have the upper extremity of the flow-pipe anywhere near the bottom where the cold water enters. It is sometimes thought that having the flow-pipe entering near the top of the tank (as just recommended) lessens the quantity of hot water at demand, but this idea is erroneous, as it will be seen that, supposing the tank to be three parts full of hot water (the upper three parts as a matter of course) when a tap is opened, this hot water commences to flow down the flow-pipe, and as fast as it does an equal quantity of cold water enters the bottom of the tank from the cold-water cistern, and pushes, so to speak, the hot water up above it (as the cold and hot do not mix readily) and no cold water will issue from the tap until all the hot has passed out; if the contents of the tank could be watched at this time, it would be found that no noticeable mixing of the hot and cold waters took place, but the quantity of the hot water would be seen gradually growing less at the top of the tank, and the bulk of cold water growing greater and greater, but creeping up from the bottom.

All draw-off services are taken from this flow-pipe, and it is usual to arrange the apparatus in the best way to avoid long draw-off services, as a long draw-off service means annoyance by having to draw a quantity of cold water (from the hot-water tap) before any hot is obtained; and this is particularly noticeable at lavatory basins, which usually have small, slow-running taps, and it is not at all uncommon to meet with instances where a lavatory tap will have cold water issue from it for half a minute after being opened before any hot is obtained. This is a serious objection in another way, as every drop of cold water that flows from a hot-water tap has been heated once, but allowed to get cold for no useful purpose, and no apparatus of this sort ought to admit of a portion of its heat being wasted in this way.

It can easily be understood that the water in a long draw-off service remains stationary when the tap is closed, and hot water that is allowed to remain so quickly loses its heat and grows cool, so that when the tap is applied to for hot water this which is cool has to be run off before the hot water issues. Then when the tap is closed the pipe is again left full of hot water only to grow cool before the tap is opened again, and it is by no means uncommon for a single draw-off service on an ill-devised apparatus to waste as much as twenty gallons of hot water per day by this means, and it is by no means rare for it to be largely accountable for the failure of an

apparatus, as the waste may exceed the quantity of water actually used.

A simple remedy, when a long draw-off service must necessarily exist, is to "return" it. This is effected by continuing the service-pipe back to where it started from, but connecting it to the return-pipe, as Fig. 15. This

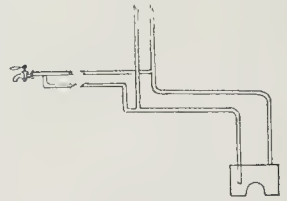


FIG. 15.

will permit the water to keep circulating in the draw-off service, and the annoyance is at an end. There is no need for the returned portion of this service to be as large as the draw-off service itself, as it is only required to just keep the water moving, and a drawback to having the returned portion of a large-sized pipe is, that when the tap is opened water will instantly flow towards it along both pipes, and so some of the water will be proceeding from the main return-pipe, which is a very objectionable feature; 3 in. may be considered amply large enough for the return to any draw-off service, or even smaller in some instances, as there is no fear of this pipe getting furred up quickly. A bath-service rarely requires this attention, as some cool water is nearly always needed here, and it is immaterial which tap it proceeds from.

The return pipe is carried from the lowest point in the tank either from the bottom, or from the side near the bottom, and from thence about three-fourths the way down the boiler, either through the top or side; but it may be mentioned here that it is best to carry these pipes from the top surface of the boiler, as bends and elbows, objectionable at any time, are particularly objectionable close to the boiler if hard water is used, as far always seems to collect within them so much more readily than in straight pipes. It is usual for the return pipe to follow the flow down, and an endeavour is generally made to prevent this pipe rising or ascending anywhere on its way down from tank to boiler, and no pipes are connected to this except the "returns" of draw-off services.

In the illustration, fig. 13 (p. 112 ante), it will be noticed that there is a pipe proceeding from the top of the tank, and carried from there to above the level of the cold-water cistern; this is the expansion or steam-pipe, and its use is to permit the free escape of any steam that may be formed, and also, as its name implies, to permit of the expansion of the water when heated. The difference in bulk between water at 32 deg. (freezing) and water at 212 deg. (boiling) is one in twenty, that is twenty gallons of water at the former temperature would fill a twenty-one-gallon vessel when raised to boiling temperature.

This expansion-pipe is usually of 1-in. tube, sometimes 3/4-in. when the apparatus is small, and its top extremity should be at least 3 or 4 ft. above the cold-water level. It is necessary to terminate this pipe either over the cold-water cistern or through a roof or outer wall, as a good deal of water drips from it, and if the boiler overheats a little hot water may be ejected by the steam as it escapes. It is most usual to carry this pipe over the cold cistern, as carrying a pipe through the roof necessitates a little greater trouble and expense, but at the same time a drawback exists in terminating the pipe over the cistern, as any hot water that is thrown out falls into and tends to warm the cold water, which is exceedingly objectionable in the hot summer months, and it is at this time that it happens most frequently, as the demand for hot water is then small, and the boiler has every opportunity to overdo its work. When possible it is best to carry the pipe through a wall, but see that it is not over any part of the premises where people may pass or stand under.

The lower extremity of this expansion pipe should not project through inside the tank, for the reasons explained in regard to the flow-pipe



in the boiler; this is very commonly overlooked, as, unless a flange is ordered to put on the tank, it is difficult to avoid it. The trouble that may arise, however, is not nearly so great as in the other case, as in a general way very little steam finds its way to the top of the house, it being condensed as it passes up the flow-pipe; but if the boiler heats well, or is a little too powerful for the apparatus, some annoyance must be experienced, and care could be taken to avoid dipping this pipe inside the tank whenever it can be avoided.

#### GENERAL BUILDING NEWS.

**UNITED METHODIST FREE CHURCH, BURNLEY.**—In a limited competition, in which five sets of drawings were received, the plans by Mr. V. Dunkerley, architect, Burnley, have been accepted for the above church. The chapel provides accommodation for about 800 people, and in the rear are minister's and trustee's seats. The building is designed in uniformity with the schools adjoining. The cost is estimated at £2,100.

**BURLINGTON HALL, ASTON, WARWICKSHIRE.**—On Saturday last Mr. George Dixon, M.P., laid the memorial stone of the New Burlington Hall, Aston, which is to be occupied by the Burlington-street Adult Early Morning School. It is intended at some future time to erect upon the site a hall, from designs selected in a competition held some time ago. The cost will be about £5,000. Mr. Thomas Guest, of Birmingham, is the architect.

**WESLEYAN CHURCH, LICHFIELD.**—We are informed that Mr. Thomas Guest, of Birmingham, has been selected, from amongst several competitors, as the architect of the proposed Wesleyan Church, Lichfield.

**ELECTRICAL WORKS, BUSHBURY.**—The new electrical works at Bushbury, near Wolverhampton, of the Electric Construction Corporation, of London and Wolverhampton (late Messrs. Ellwell & Carter, Limited), are now almost completed, and the machinery and plant will shortly be put in. A site of 24 acres, with a siding on to the London and North-Western line, has been acquired, and the buildings already erected cover an area of about 4½ acres. The construction has been carried out by Mr. Henry Lovatt, contractor, of Wolverhampton, from the plans of Mr. G. H. Stanger, architect and engineer. The shops cover an area of 76,350 square ft., exclusive of a warehouse containing 8,908 square ft. They are divided into five bays of 30 ft. span, two of 25 ft., and one of 45 ft. This last is for the accommodation of heavy machinery, and is provided with galleries on either side, carried by columns and cross girders, 10 ft. apart, covered with a 3 in. plank floor. The roofs over the shops are carried on cast-iron columns, 6 in. in diameter, in groups of four for the large bay, and two for the remaining shops, with base-plates bolted down into the concrete foundation and upper columns for carrying the roof trusses. The offices and administration block comprise a very extensive range of buildings. The pattern-shop and store-room are each 100 ft. by 33 ft. 6 in. The iron-foundry is 160 ft. by 32 ft. 2 in., and the brass-foundry is 62 ft. 2 in. by 40 ft. They are constructed in the same manner as the large shops, with columns, girders, and travelling cranes. Three large drying-stoves are provided, with specially-designed ranges for heating. Two of Thwaites's patent rapid cupolas are now being erected there. There are also a blacksmith's shop, dining-rooms, and kitchens. The works are built entirely of brick. The ordinary bricks were supplied by the Tibbington Brickworks, and the blue bricks from the Hockley Hall Company. The facing-bricks for the offices and mess-rooms were obtained from Messrs. Partridge & Co., King's-winnford. A large part of the roof area over the shopping is glazed on the "Simplex" system. The office corridors are laid with Ebnor's Terrazzo mosaic. The works form a prominent block as seen from the London and North-Western main line, and they are the subject of one of the most important building contracts that has been undertaken in Wolverhampton or the neighbourhood for some years past.

**REVEREND ST. JOHN'S CHURCH, CANTON, CARDIFF.**—On Sunday last special services were held at St. John's Church, Canton, Cardiff, in connexion with the dedication of the new church recently erected in the church. The reverend is of Caen stone, with red and green Irish columns supporting the cusping and canopies. The three niches are to be filled with paintings in oil on canvas, the central one portraying the Good Shepherd, with St. Peter and Dunmire's stone, have also been fixed. The new altar about 2 ft. above the old level. The work has been carried out by Mr. William Clarke, of Landaff, from the design and under the superintendence of Messrs. Kempson & Fowler, architects, Landaff.

**SWANLAND HOUSE, PENSHURST.**—Large additions are being made at Swanland House, Penschur, the residence of Mr. George Drummond, Mr. M. E. Macartney is the architect. The whole of the fireproof floors are being put in on Fawcett's system.

**DEVELOPMENT OF BARRY, SOUTH WALES.**—In reference to the paragraph under this heading in our last week's issue, we are asked by Stuart's Granolithic Paving Company to say that their paving has been very largely used in the footpaths there, viz., about 90,000 ft.

#### SANITARY AND ENGINEERING NEWS.

**THE ASSOCIATION OF PUBLIC SANITARY INSPECTORS OF GREAT BRITAIN.**—A special general meeting of the members of this Association was held on Wednesday evening last at Carpenters' Hall, London-wall, E.C., in accordance with Rule VIII, to receive a report from the Council nominating Mr. B. W. Richardson, F.R.S., to the position of President, in succession to the late Sir Edwin Chadwick. The report was adopted, and Dr. Richardson was unanimously elected. Mr. Aubrey Richardson being at the same time appointed honorary solicitor to the Association. The annual summer meeting of the Association will be held on Saturday, the 23rd inst., at Great Yarmouth, by the invitation of the Mayor and Corporation.

**CRYSTAL PALACE SCHOOL OF PRACTICAL ENGINEERING.**—On Saturday afternoon last Sir James N. Douglass, F.R.S., Engineer-in-Chief to the Corporation of the Trinity House, and Member of the Council of the Institution of Civil Engineers, distributed the certificates to the students of the Crystal Palace School of Practical Engineering, awarded for the summer term, 1890. The examiners for the term were Mr. A. R. Sennett and Mr. S. H. Cox, who reported that the Electrical section was a valuable addition to the work, in view of the great advances recently made in the practical applications of electrical science. The Colonial section appeared to be filling a want which was more than ever felt, the means of obtaining a practical knowledge of subjects and processes only to be met with in colonial occupations. The Class work throughout the term had been very satisfactory, and the drawing specimens exhibited the result of careful training and a thorough appreciation of what was taught on the part of the students. Sir J. N. Douglass, in presenting the certificates, expressed himself highly pleased with the technical and theoretical work of the school, which he had that morning inspected in the several departments. He believed that institution to be a most valuable gateway to the profession, and it had given him real pleasure to be present. He congratulated the students upon the excellent character of their work, and said he envied the young men of the present generation of engineers for the great privileges they enjoyed with regard to the education they received to fit them for their profession. An Englishman ought never to be afraid of competition, and he believed it was one of the best things that could happen to him to be placed in a position where he would have to compete with others. If an Englishman did his work honourably and faithfully he was sure of success in any part of the world. The Chairman, in the course of further remarks, spoke in high terms of the practical nature of the teaching given by the Principal, Mr. J. W. Wilson, M.Inst. C.E., M.Inst. M.E. The report of the Examiners stated that Mr. F. D. Maw was highest in the first year's course for Mechanical Engineering. In the Drawing Office, first year's course, Mr. W. Boer was first. In the Pattern Shop, first year, Mr. H. F. Key was first. In the Fitting Shop, first year's course, Mr. F. D. Maw was first. In the Civil Engineering Section, second year's course, Mr. H. E. Heald and Mr. J. W. Revy were bracketed first in the first term, Mr. W. E. Brewerton was first in the second term; and Mr. E. M. Proes and Mr. W. G. Wales were bracketed first in the third term. In the Electrical Section Mr. F. T. W. Fletcher was first. In the Marine Engineering Section Mr. G. L. Wingate was first. In the Colonial Section Mr. S. W. Ormsby was first in the first grade and Mr. C. M. F. Williams was first in the second grade, Mr. W. G. Curtis being first in the third grade.

**DUFFIELD WATERWORKS.**—The Belper Rural Sanitary Authority have instructed Mr. W. H. Radford, C.E., Nottingham, to report on the best mode of obtaining a water supply for the villages of Duffield and Duffield Bank, in Derbyshire.

**PENDLEBURY SEWAGE WORKS.**—These works, having been completed, were opened on the 28th ult. They are stated to have resulted in the purification of what has hitherto been a very foul stream, and to have thus removed one of the many sources of pollution to the River Irwell. Pendlebury is situated about four miles from Manchester, and is within the district of the Swinton and Pendlebury Local Board. It comprises a population of between 6,000 and 7,000; and being in a watershed separate from the main portion of the Swinton and Pendlebury Local Board's district, its sewage had to be dealt with independently. Until recently the various sewers discharged direct into the Slack Brook, but in the year 1888 the Board took steps to abate the nuisance caused thereby, and last year the intercepting sewer was completed along the whole of the sewage to a point between the Clifton Hall Colliery and the Lancashire and Yorkshire Railway (Atherton line), where a plot of land was

available admirably suited for the construction of sewage purification works. It is about two acres in extent. The sewage to be purified is mostly domestic, but it reaches the works in a highly concentrated condition. Recently, however, a quantity of manufacturing sewage has been taken into the sewers, so that the dry weather flow will probably average about 160,000 gallons per twenty-four hours (25 gallons per head). The outfall sewer discharges into a small chamber in which is placed a strainer having cleaning rakes attached. The sewage then passes over a sill, and at this point the precipitating material is added, the flow of sewage driving a 4 ft. breast water-wheel, which is geared to the spindle of a distributing hopper (Beloe's patent). The precipitant used is called "ferrozene," and is supplied by the International Sewage Purification Company, whose system of purification is adopted in its entirety at these works. The quantity of ferrozene added (which will probably average about seven grains per gallon) is automatically regulated by the flow of the sewage. The mixer is situated upon a hill-side about 20 ft. above the level of the settling tanks; and the sewage, in its passage to the tanks, has to traverse a distance of about 120 ft., at one point of which is a series of baffle-plates to thoroughly incorporate the ferrozene with the sewage. The settling-tanks are four in number, with a total capacity of about 500,000 gallons. They are large enough to serve for a greatly increased population. The tanks are of brickwork, with hoop-iron bond, and faced with blue Staffordshire bricks. Cast-iron roughing conveys the sewage along the length of the tanks; and from the troughs the sewage enters one or other of the tanks by means of a float-valve inlet board, which allows it to flow in quietly, and the board is also arranged so as to some extent to oxygenize the sewage by breaking it up into small particles. A tank having been filled, it is allowed to stand for not less than one hour to allow precipitation to be completed. The tank effluent is conveyed by a pipe to the filter-beds. These consist of a total area of about 150 square yards, and are divided into four plots. Shallow troughs are fixed on brackets around three sides of each bed, and the water overflows the sides. The filtering media consists of a total thickness of 3 ft., made up in layers as follows, viz., 4-in. pipes embedded in 6 in. of broken stones, 5 in. of gravel, 4 in. of sand, 12 in. of sand and "polarite" mixed together in equal proportions, and 9 in. of sand. The last layer forms the top one. The beds are arranged in pairs, and by means of valves the top layer of sand in one bed may be freed from the slight accumulation of dirt upon its surface by upward washing from the water in the adjoining bed. It is stated that the effluent emerges from the polarite filters perfectly bright, colourless, and odourless. It is then conveyed through the adjoining pool (the Carrs) by means of an efficient sewer of cast-iron pipes, and finally discharges into the Carrs near its junction with the river. The sludge is removed from the tanks through valves, and the land on one side being much lower than the tank floors, offers a ready means of getting at the sludge. A large part of the water in the sludge is removed by confinement in narrow chambers. The supernatant water is pumped back to the tanks to be re-treated, and the sludge will be conveyed in troughs direct from the sludge-shed and dug into the adjoining land, which is rented for the purpose, and will be cultivated. The sludge-pit is rooled over. The purification works have cost about £5,250, including land, but excluding land and engineering expenses. The effluent sewers cost about £1,600, including easements; and the intercepting sewers about £2,800. The works were originally designed by Mr. A. R. Mountain, late Surveyor to the Board, and now Surveyor to the Whittington Local Board. Under the direction of the Board, their execution was commenced under the late Mr. R. Vawser, of Manchester, who also approved the design; but upon that gentleman's death, Mr. Theo. S. McCallum, A.M.Inst.C.E., was appointed Engineer, and the works, with several modifications and additions, have been completed under his supervision. The contractors for the works are:—For the intercepting sewer, Mr. J. Unsworth, Earlsdown; for the settling tanks, &c., Mr. M. W. Walsley, Manchester; and for the filter-beds, Mr. S. Johnson, Pendleton.

#### FOREIGN AND COLONIAL.

**THE SWEDISH BUILDING LAW.**—On the representation of the Insurance of Workmen Committee of the Swedish Parliament, the Government has added the following clause to the Swedish building law:—"The building boards of the towns shall issue regulations as to the erection of scaffolding in order that they be not dangerous to workmen or others, it being also their duty to see that they are carried out."

**BUCHAREST.**—A competition, open to architects of all nations, is announced for the best designs for a Chamber of Deputies and a Senate House for the Roumanian Government, at Bucharest. These are to be treated as two separate competitions, and for each of them three premiums will be given, of 15,000, 7,000, and 3,000 francs. Particulars can be obtained from the Secretary of the Council of Ministers, at Bucharest.



FRANCE.—A statue of Gay-Lussac has been inaugurated at Limoges. There is also announced at Poitiers the inauguration of a statue of M. Gacquer, a former deputy, and one at Evreux of Daniel, surgeon to Louis XV., and who was the first to practise (at Paris) the operation for the removal of cataract. The monument to Admiral Courbet will be inaugurated at Abbeville on the 17th.—A railway from Hyères to St. Raphael has just been opened, which will eventually be connected with the Paris, Lyons, and Mediterranean system.—M. Decauville, who last year organised the narrow-gauge railway at the Paris Exhibition, has established a similar railway at Royan, in the Lower Charente district, putting in communication all the bathing stations at Royan and its environs.—At Rochelle, in the same district, the President is to open on the 19th the Port de la Pallice, a harbour which has been constructed at an expenditure of nearly 15 million francs, and will have at the lowest tides a depth of 9 metres of water.—The Comtesse de Chateau-Narischkine has presented to the Department of Finances the fine estate of Keryvot, near Concarneau, as a people's park, and including also the chateau, of the Renaissance period, which contains a valuable collection of objects of art.—A number of leading industrial firms of Paris who received medals at the Exhibition of 1889, have decided, at a meeting held at the Hotel Continental, to set on foot a French exhibition at Moscow next year.—The French exhibition at Moscow publishes a decree for a "credit" of 400,000 francs towards the laying of an electric cable between Folkestone and Calais, the expense to be shared between England and France, and an overhead wire to be carried from the Calais shore end of the cable to Paris.—It is announced that the Ecole des Beaux-Arts at Toulouse is to be rebuilt, at a cost of five millions of francs.—Parliament has voted 350,000 francs for the enlargement of the "bassin de l'Eure" in the port of Havre.

HARDENGER.—A chateau of somewhat palatial form is being built a short distance from here, on one of the finest sites in Norway. It is generally believed that the place is being put up for the Emperor of Germany, who is said to have been rather enthusiastic about the scenery in these parts, and to have expressed the wish to be able to stay here on *terra firma* with his family for a week or two every summer.

COPENHAGEN.—The inactivity in the building trade of the town will be at once remarked by the visitor, who, we believe, would have some difficulty in finding a dozen buildings in course of erection. Quite in contrast may be termed the great activity of the paviors, several of the main thoroughfares being "up," and a large number of men being employed in regulating the curbstones, laying a very neat slab pavement, and preparing the roadways for asphalt, a pavement, to far, not to be seen in the city.

BERLIN.—The special exhibition which has been opened in connexion with the much-spoken-of Medical Congress, and the exhibits of which have found room on the grounds of the "Landes-Anstalten Park," was well organised and arranged. The number of architectural designs hung is an exceedingly large one, so that specialists who are interested in the planning of hospitals, lunatic asylums, &c., will find a large field for study. Besides the plans, elevations, and details of interior arrangements (often supplemented by models of wings, rooms, &c., as the case may be) of the most important hospitals of the empire, a number of designs for town improvement, drainage, and sewers, public baths (especially such as have been erected lately in the bathing places of the central and southern provinces), hydropathic establishments, &c., were to be seen. The City of Berlin showed the &c., were to be seen. The largest contingent of modern hospitals, those of Friedrichshagen (784), am Urban (592), and Moabit (812), together 2,188 beds, attracting most notice. During the Congress week most of the municipal institutions, including waterworks and sewage-stations, were visited by the members, and we hear that their impression was a very satisfactory one on the whole. It may be well to state that several models of portable hospitals as used in or proposed for use in the army were on view in the exhibition grounds, and that the portable kitchen, operation room, &c., were represented both in tent and hut form. The regulation portable hut, with felt wall-sheeting on wooden frame, the wooden floor being used as sides of the packing-cases for the paraphernalia, excited special interest.

RESTORATION OF AN OLD NORSE BUILDING.—The Norwegian Government have decided upon restoring the ancient Hæter Hall in Bergen, which was the residence of the Norse kings some 900 years ago. The style is Early Gothic. For many years it has served as a grain storehouse.

ARCHITECTURAL EXHIBITION IN TURIN.—The Italian Government announces that an architectural exhibition will be held in Turin between September 23 and October 23 next. A portion of the exhibition will be of an international character, and the embrace plans for the enlargement of cities, the improvement of their sanitary conditions, with plans of works of this kind that have recently been carried out, or are to be carried out.

THE SWEDISH GRANITE INDUSTRY.—A new company has been formed in Sweden for the working of certain granite quarries in the province of Calmar, with a capital of 40,000.

## MISCELLANEOUS.

THE COVENANTERS' MONUMENT, KIRKWALL.—Mr. James Hutcheon, Aberdeen, has just finished a memorial of the 200 Covenanters who perished at Deerness, near Kirkwall, in 1679. It is to be erected at Kirkwall, in close proximity to the Town-hall. Composed of Rubislaw grey and Hill of Fare red granite alternately, it stands 16 ft. high, and has a 4 ft. square under-base, finely dressed, with a bold eplay on three sides. At the front side of the base there is a drinking-trough for dogs. The second tier is 3 ft. 1 in. square, and is of polished Rubislaw granite. It has a moulding round the upper edge, and in one side has a cavity for the supply of water to the trough. The die, or principal part, of the monument, composed of Hill of Fare granite, measures 2 ft. 6 in. high by 2 ft. 6 in. in diameter. It is polished on each side, and has a representation of a rope carved on each corner. Polished Rubislaw granite basins are fitted in on three sides, and the water flows into these from representations of lions' heads in bronze. A cap of Rubislaw granite, also polished on the sides, has on the corners four moulded feet of the granite. These vases are about 1 ft. 4 in. high by 8 in. in diameter. In front of the cup there is the following inscription:—"Erected by voluntary subscription to the memory of 200 Covenanters who perished at Deerness in 1679." The cap is surmounted by a polished Hill of Fare granite column, 8 ft. high, with a bold mouldure. The column has a cap of polished Rubislaw granite.

MONUMENT TO THE LATE MR. JOHN RYLANDS, MANCHESTER.—The monument which has been for some time in course of erection in the Southern Cemetery, in memory of the late Mr. John Rylands, is now completed. It is hexagonal in plan, is raised upon two granite steps from the level of the enclosure. The column stands 23 ft. in height, of which the solid base measures 3 ft. This lower portion has panelled faces inscribed with a series of scripture texts. From the six upper angles of the panelled base rise six square pillars, fluted in front; terminating with caps and richly-carved corbels. On each side, supporting a moulded cornice, are several divisions of which bear ornate scrolls respectively inscribed with the words "Faith," "Joy," "Peace," "Mercy," "Love," "Hope." Above the cornice, and directly over the pillars, are six angelic figures, kneeling or half-seated, four of which bear the symbols of the Christian warfare, as described by St. Paul in the sixth chapter of the Epistle to the Ephesians. In the space between the figures are carved shields, alternately bearing wreaths of laurel, oak, and palm, as emblems of Honour, Might, and Victory. At a higher level, and recessed from the line of these emblematic figures, are smaller columns supporting the cupola, at the angles of which are the forms of six angels standing; four with trumpets as heralds of salvation to the four quarters of the world. Of the other two one represents Faith, triumphantly holding to the Cross; the other Hope, leaning upon an anchor and directing a rapt upward gaze to Heaven. The space between and above the pillars forms a vaulted dome, on the interior arch of which are starry and other emblematic designs. In the open space beneath the dome, and resting on the centre of the base, is a large block of granite containing the inscription:—"John Rylands, of Manchester. Born February 7, 1801. Died December 11, 1888. In loving memory." With the exception of the granite vaulted dome, the monument is of white Sicilian marble, the hardest procurable. The whole monument has been designed, and its erection superintended, by Messrs. Heathcote & Rawle, architects, of Manchester. The sculpture is from the studio of Mr. Boulton, Cheltenham; the bronze railings were made by Messrs. Hoole & Co., Sheffield; and the rest of the work has been executed by Messrs. Patteson, of Manchester.

THE ENGLISH IRON TRADE.—The improvement in the English iron market, of which the first signs showed themselves last week, has extended. The better tone is due to three principal causes. In the open space beneath the dome, and resting on the centre of the base, is a large block of granite containing the inscription:—"John Rylands, of Manchester. Born February 7, 1801. Died December 11, 1888. In loving memory." With the exception of the granite vaulted dome, the monument is of white Sicilian marble, the hardest procurable. The whole monument has been designed, and its erection superintended, by Messrs. Heathcote & Rawle, architects, of Manchester. The sculpture is from the studio of Mr. Boulton, Cheltenham; the bronze railings were made by Messrs. Hoole & Co., Sheffield; and the rest of the work has been executed by Messrs. Patteson, of Manchester.

HOUSING OF THE WORKING CLASSES.—The Housing of the Working Classes Bill was on the 5th inst. considered by the House of Lords' Grand Committee on Law, Lord Herschell presiding. In reply to Lord Norton, Viscount Cross said that the measure made no alteration in his Act on the same subject. He then moved as a new sub-section that the County Councils or any of their officers should, for the purposes of closing and demolishing unhealthy or obstructive buildings, have the same right of admission to any premises as any Vestry, District Board, local authority, or their officers in carrying out the Public Health Acts. The amendment was agreed to. It was also resolved, at the instance of Viscount Cross, that local authorities in London when of opinion that an improvement scheme under the Bill was of general importance to the whole county of London, should only act when the unhealthy buildings proposed to be demolished were dwelling-houses, the latter word being substituted for "premises." Some minor amendments having been made in the Bill, it was ordered to be reported to the House.—*Daily News*.

NEW MEDAL ROOM, BRITISH MUSEUM.—As will have been seen from an advertisement in our columns of the 2nd inst., the authorities are about to provide a new Medal Room at the British Museum, and since then certain subsidiary alterations in that department. The national collection of coins and medals is not ordinarily open to members of the public. The original collection made by Sir Hans Sloane, worth some thousands of pounds as specie alone, has since been enriched by numerous others (including finds of Indian gold), such as the "Penny" medals, Sir Robert Cotton's, the Cracherode medals and coins; Robert's English coins, bought for 4,000 guineas; the Towneley and Payne Knight ancient coins, Miss Banks's bequest, the Rich collection (Asiatic), and so on. Amongst the additions during last year was the Pandit Bhagwan Lal Indraji's bequest of four thousand and more coins, chiefly Indian. Here have been deposited Queen Anne farthings sufficient in number to belie the popular tradition, and, indeed, it is stated that a large number were circulated. Of personal mementoes we may cite the following, as also having been acquired by this department. The oval-shaped gold token, or "touch-piece," which was customary, that sovereign bestowed when she touched the infant Samuel Johnson for "the evil"; before the Restoration an angel coin was given to the child; the "Pulney" guinea, an heir-loom, presented in 1828 by Sir John Murray, which Robert Walpole had lost to the Earl of Bath; the master of his misquotation in the House from Horace, relic of past days when our senators adorned their speeches in a fashion that is now rare; together with two gold snuff-boxes, formerly the property of Napoleon, who gave the one to the Honourable Mrs. Damer, and bequeathed the other—a gift to him from Pope, Pius VI., to Lady Holland.

THE LONDON AND COUNTY BANKING COMPANY.—The report of this company, adopted at the half-yearly general meeting held on the 7th inst., shows that, after paying interest to customers and all charges, making provision for bad and doubtful debts, &c., &c., the net profits for the half year were £237,294 12s. 11d. The Directors have declared an *interim* dividend of 10 per cent. for the half-year of 11 per cent. The balance-sheet is printed in our advertisement column.

MR. HENRY LOVERIDGE, of Budge-row, asks us to state that he is, happily, in perfect health. The statement circulated in some quarters that he was seriously ill has arisen through a serious accident to his son Gilbert Henry, from which the boy has quite recovered.

SOMERSETSHIRE ARCHAEOLOGICAL SOCIETY.—The annual meeting of this society is fixed for August 27, 28, and 29, at Castle Cary. The President of the meeting is Mr. Henry Hobbouse, M.P. Excursions will be made to Ditchet, Hornblotton, Alford, Bolter's Bridge, Lyte's Cary, West Camel, Queen Camel, Sparkford Hill Quarry, Haregrove, South Cadbury, North Cadbury, and Hadspen. Evening meetings will be held for the reading and discussion of papers.

ELECTRIC LIGHTING IN ST. PANCRAS.—A special meeting of the St. Pancras Vestry, held on the 6th inst., decided, by 47 votes to 7, to accept tenders amounting to upwards of 50,000*l.*, to carry out the electric lighting scheme of their Engineer, Professor Henry Robinson.

## LEGAL.

WHAT IS "GOOD TENANTABLE REPAIR"?

PROOF OF S. HART.

Following up former references to this important case,\* we are now able to give the gist of the judgment of the Master of the Rolls in the Court of Appeal.<sup>†</sup>

Lord Esher, M.R.: The question in this case arises between landlord and tenant as to whether the tenant did, or did not, break his agreement,

\* See *Builder*, May 10 last, p. 334, and May 17, p. 357. <sup>†</sup> As printed in the "Law Reports," 25 Q. B. D., p. 42.



made with respect to a tenancy for three years, to keep premises in "good tenable repair," and leave them in good tenable repair at the expiration of the tenancy.

The case was tried before one of the Official Referees, Mr. Ridley, and he gave a judgment laying down the principles upon which he meant to act, and did act, in making his award. The case came before a Divisional Court, who thought that some, — not all, — of those principles were not correct, and that if he did act upon them it might be that he had arrived at a wrong result in his decision as to figures and facts. The Divisional Court, therefore, did not attempt absolutely to decide the case, but they sent it back to the Official Referee in order that he might again take it into consideration, and work out his figures upon the principles enunciated by them. The plaintiff has appealed to this Court, and his appeal must be based upon the ground that the principles stated by Mr. Ridley are right, and those stated by the Divisional Court are wrong. The question, therefore, arises whether we agree with Mr. Ridley's principles or with those of the Divisional Court, but we have not open to us the alternative course of saying that we do not agree with either, and of ourselves laying down the principles upon which we think that the Official Referee ought to deal with the facts and work out the figures.

What is the true construction of a tenant's contract to keep premises in "good tenable repair?" Now, it is not an express term of the contract that the premises should be put into tenable repair, and it may therefore be argued that, where it is conceded, as it is in this case, that the premises were out of tenable repair when the tenancy began, the tenant is not bound to put them into tenable repair, but only bound to keep them in the same repair as they were in when he became the tenant of them. But it has been decided, — and I think rightly decided, — that, where the premises are not in repair when the tenant takes them, he must put them into repair in order to discharge his obligation under a contract to keep and deliver them up in repair. If the premises are out of repair at any time during the tenancy, the landlord is entitled to say to the tenant, "You have now broken your contract to keep them in repair;" and if they were out of repair at the end of the tenancy he is entitled to say, "You have broken your contract to deliver them up in repair." I am of opinion that under a contract to keep the premises in tenable repair and leave them in tenable repair, the obligation of the tenant, if the premises are not in tenable repair when the tenancy begins, is to put them into, keep them in, and deliver them up in tenable repair. Now, what is "tenable repair?" Definitions have been given at different times by the Courts. In *Belcher v. Mackintosh* Alderson, B., directed the jury as to the law with respect to a covenant by a lessee to put premises into "habitable repair," and so to deliver up the same. He says (I am reading from Moody and Robinson's Report): "It is difficult to suggest any material difference between the words 'habitable repair,' used in this agreement, and the more common expression, 'tenable repair'; they must both import such a state as to repair that the premises might be used and dwelt in not only with safety, but with reasonable comfort, by the class of persons by whom, and for the sort of purposes for which, they were to be let." That is the whole definition, and, so far as it goes, it is good enough. Then he proceeds to apply it: "They were old premises and dilapidated; the agreement was not that the tenant should give the landlord new buildings at the end of his tenancy, but that he should take the premises at the end of their former dilapidated condition, and deliver them up fit to be occupied for the purposes they were used for." In *Payne v. Haines* the contract was to keep the premises, and at the expiration of the tenancy deliver up the same, in "good repair," which is much the same thing as "tenable repair." This was the case which decided that order to satisfy the tenant's obligation under his contract it was not sufficient for him to deliver the premises in the same condition of repair when he took them; he must deliver them in good repair, even if they were not in good repair when the tenancy began. Parke, in the course of his judgment, said: "This contract to keep the premises in good repair is not a contract to repair, but that cannot justify the keeping of premises in bad repair because they happened to be in that state when the defendant took them. The facts show that the age and class of the premises with their general condition as to repair, may be estimated in order to measure the extent of the repairs to be done. Thus a house in Spitalfields is to be repaired with materials inferior to those used in a house in Grosvenor-square, and in the latter, but this lesser cannot say he will do no repairs, or leave the premises in bad repair, because they were old and out of repair when he took them. He was to keep them in good repair, and in that case, with reference to their age and class, he was to deliver them up at the end of the term." Alderson, B., said: "A contract to put premises in good repair cannot mean to furnish new ones where

those demised were old, but to put and keep them in good tenable repair with reference to the purpose for which they are to be used." Rolfe, B., said: "The term 'good repair' is to be construed with reference to the subject-matter, and must differ, as that may be a palace or a cottage; but to 'keep in good repair' presupposes the putting it into, and means that during the whole term the premises shall be in good repair." In *Muntz v. Goring*, [Findal, C.J., said: "Every one knows what such a tenancy means, and the tenant must fulfil it according to the nature of the premises; for it is established by *Stanley v. Towgood* and other cases that the same nicety of repair is not exacted for an old building as for a new one." It seems to me that in none of these cases can there be found quite as full a definition of the meaning of the term "tenable repair" as the words require and import. The result of the cases seems to be this: the question whether the house was, or was not, in tenable repair when the tenancy began is immaterial; but the age of the house is very material with respect to the obligation both to keep and to leave it in tenable repair. It is obvious that the obligation is very different when the house is fifty years older than it was when the tenancy began. Lord Justice, I., has drawn up a definition of the term "tenable repair" with which I entirely agree. It is this: "Good tenable repair is such repair as, having regard to the age, character, and locality of the house, would make it reasonably fit for the occupation of a reasonably-minded tenant of the class who would be likely to take it. The age of the house must be taken into account, because nobody could reasonably expect that a house 200 years old should be in the same condition of repair as a house lately built; the character of the house must be taken into account, because the same class of repairs as would be necessary to a palace would be wholly unnecessary to a cottage; and the locality of the house must be taken into account, because the state of repair necessary for a house in Grosvenor-square would be wholly different from the state of repair necessary for a house in Spitalfields. The house need not be put into the same condition as when the tenant took it; it need not be put into perfect repair; it need only be put into such a state of repair as renders it reasonably fit for the occupation of a reasonably-minded tenant of the class who would be likely to take it. I think our definition is an expansion of the definitions given in the earlier cases, or rather it is a collection of all the different parts of the definition to be collected from those cases. I can see nothing in the case of *Crawford v. Newton* contrary to our definition. I think that case goes far to support it.

I will add a few words as to the way in which the definition should be worked out in the present case. The Official Referee appears to have said that in his view "tenable repair" included painting, papering, and decorating. If he meant, as I think he must have meant, that it included all papering, painting, and decorating, I have no hesitation in saying that his construction of the term "tenable repair" was wrong. Again, he has said that the tenant's obligation is to "re-paper with similar paper to that which was on the walls before, and re-paint with similar paint to that which was on the painted portion of the premises before." I think that view was wrong also. With regard to the papering, Cave, J., in the Court below, said: — "I cannot see how in any case a man can be bound to put new paper on the walls simply because the old paper which was on at the time when he took the house, or which he has subsequently put on the walls, has become worn out." I agree that he is not bound to re-paper simply because the old paper has become worn out, but I do not agree with the view that under a covenant to keep a house in tenable repair the tenant can never be required to put up new paper. Take a house in Grosvenor-square. If when the tenancy ends, the paper on the walls is merely in a worse condition than when the tenant went in, I think the mere fact of its being in a worse condition does not impose upon the tenant any obligation to re-paper under the covenant, if it is in such a condition that a reasonably-minded tenant of the class who take houses in Grosvenor-square would not think the house unfit for his occupation. But suppose that the damp has caused the paper to peel off the walls, and it is lying upon the floor, so that such a tenant would think it a disgrace, I should say then that the tenant was bound, under his covenant to leave the premises in tenable repair, to put up a new paper. He need not put up equal or a similar kind, — which I take to mean of equal value, — to the paper which was on the walls when his tenancy began. He need not put up a paper of a richer character than would satisfy a reasonable man within the definition.

The same view applies as to painting. If the paint is in such a state that the woodwork will decay unless it is painted, it is obvious that the tenant must repaint. But I think that his obligation goes farther than that. A house in Spitalfields is never painted in the same way as one in Grosvenor-square. If the tenant leaves a house in

Grosvenor-square with painting only good enough for a house in Spitalfields, he has not discharged his obligation. He must paint it in such a way as would satisfy a reasonable tenant taking a house in Grosvenor-square. As to whitewashing, one knows it is impossible to keep ceilings in the same condition as when they have just been whitewashed. But if, though the ceilings become blacker, they are still in such a condition that a reasonable man would not say, "I will not take this house because of the state of the ceilings," then I think that the tenant is not bound, under his covenant to leave the house in tenable repair, to whitewash them. Take, again, the case of a house in Grosvenor-square having an ornamental ceiling, which is a beautiful work of art. A tenant goes in and finds such a ceiling in the house, and in course of time the gilding becomes in such a bad condition, or so much worn off, that the ceiling is no longer ornamental. I should think that a reasonable tenant taking a house in Grosvenor-square would not require a gilded ceiling at all. If that be so, on the mere covenant to leave the premises in tenable repair, I should think that the tenant who has entered into that covenant was not bound to regild the ceiling at all. As to the floor, it may have been rotten when the tenancy began. If it was in such a state when the tenancy began that a reasonable man would take the house with a floor in that state, then the tenant's obligation is to put the floor into tenable repair. The question is, what is the state of the floor when the tenant is called upon to fulfil his covenant? If it has become perfectly rotten, he must put down a new floor; but if he can make good in the sense in which I have spoken of, all the other things — the paper, the paint, the whitewashing — he is not bound to put down a new floor. He may satisfy his obligation under the covenant by repairing it. If he leaves the floor out of repair when the tenancy ends, the landlord comes in, the landlord may do the repairs himself, and charge the costs as damages against the tenant; but he is only entitled to charge him with the necessary cost of a floor which would satisfy a reasonable man taking the premises. If the landlord puts down a new floor of a different kind, he cannot charge the tenant with the cost of it. He is entitled to charge the cost of doing what the tenant had to do under his covenant; but he is not entitled to charge according to what he has himself in fact done.

I think we have explained more fully than it was explained in the Court below, what is the true construction of the contract to keep premises in tenable repair. If our judgment is inconsistent with any part of the judgment of Cave J., we must, of course, be taken to disagree with it, but we certainly agree that this case goes back to the Official Referee.

Lord Justice Lopes concurred.

## MEETINGS.

SATURDAY, AUGUST 16.  
Architectural Association. — Concluding day of the Annual Excursion.  
Royal Archaeological Institute. — Annual Meeting, Gloucester (continued).  
MONDAY, AUGUST 18.  
Cambrian Archaeological Association. — Annual Meeting, Holywell, Flintshire.  
Royal Archaeological Institute. — Annual Meeting, Gloucester (concluded).  
TUESDAY, AUGUST 19.  
Cambrian Archaeological Association. — Annual Meeting (continued).  
Royal Archaeological Institute. — Annual Meeting, Gloucester (concluded).  
WEDNESDAY, AUGUST 20.  
Cambrian Archaeological Association. — Annual Meeting (continued).  
THURSDAY, AUGUST 21.  
Cambrian Archaeological Association. — Annual Meeting (continued).  
FRIDAY, AUGUST 22.  
Cambrian Archaeological Association. — Annual Meeting (concluded).  
SATURDAY, AUGUST 23.  
Association of Public Sanitary Inspectors. — Annual Summer Meeting, Great Yarmouth.  
Glasgow Architectural Association. — Visit to Lindisgow Palace and St. Michael's Church.

## RECENT PATENTS.

### ABSTRACTS OF SPECIFICATIONS.

12,126. — IMPROVEMENTS IN WATER-CLOSETS: *J. and A. Duckett*. — According to this invention, a circular weir is substituted for the ordinary water-closet basin. The outlet is through its centre to a trap below, when, entering the inlet to the weir or basin, the water is deflected by a suitable shell and caused to traverse the circular track of the weir in two currents, which meet together at the back of the track opposite the inlet with great force, carrying all before it into the central outlet to the trap below.  
13,008. — FIRE-RESISTING FLOORING: *J. Wilson*. — In order to provide a simple and economical method of forming combined metal and concrete flooring, decking, &c., and of fixing it; rolled steel or iron beams of peculiar section are by this patent placed upon the usual supports, and the beams or girders are filled in or embedded with concrete or composition. The beams are preferably of a semi-elliptical section, with flanges

\* S. C. & P. 720; 2 Moo. & R. 138.  
† 10 M. & W., 541.

\* 4 Bing. N.C. 451.  
† 3 Bing. N.C. 4.  
‡ 36 W. R. 54.



[Three other tenders.]



## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITIONS.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
Higher Grade School for Boys	Swansea (U.D. Sch. Bd.)	Not stated.	Sept. 10
New Board School	Oldham School Board	500, 1st, and 2nd.	Oct. 1
Primary Schooling House.	London C.C.	1000.	Nov. 15

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Enlargement of Chapel, Rainhill Asylum, Liverpool, Kensington, &c.	Committee	Crayson & Duld	Aug. 19
Waterworks at Rainhill	Waterbury Corp.	E. Martin Scott	do.
Waterworks at Rainhill	Whitehead Union	Brass J. Capell	do.
Waterworks at Rainhill	Bristol U.S.A.	F. Ashmole	Aug. 20
Waterworks at Rainhill	Reading S.A.	A. W. Barry	do.
Waterworks at Rainhill	Rule of Right R.R. & A. Lucas	Francis Newman	do.
Waterworks at Rainhill	Lucas Hotel Co. Ltd.	Wm. M. Mitchell	do.
Waterworks at Rainhill	Wood Green Radical Club	Raymond Berry	Aug. 21
Waterworks at Rainhill	Union Guardians	J. S. Moffat	Aug. 22
Waterworks at Rainhill	Mr. Chalkley	Chris. Mulvaney, C.E.	do.
Waterworks at Rainhill	Messrs. Verrall & Co.	Holland & Son	do.
Waterworks at Rainhill	Committee	Official	do.
Waterworks at Rainhill	Baths Committee	do.	do.
Waterworks at Rainhill	Abbridge U.S.A.	Holland & Son	Aug. 23
Waterworks at Rainhill	Com. of H. M. Works	Official	Aug. 24
Waterworks at Rainhill	London Corporation	E. G. Mawley	Aug. 27
Waterworks at Rainhill	Reading S.A.	A. D. Edwards	do.
Waterworks at Rainhill	Reading Guardians	C. Smith & Sons	Aug. 28
Waterworks at Rainhill	South Shields Corp.	Parker & Balmer	do.

## CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Additions and Alterations to Police Station, Chelmsford	Southampton C.C.	Jas. Robinson, C.E.	Aug. 29
*Sewerage and Sea Defences	Sandgate Local Board	J. H. Walton	Aug. 30
*Dock, Shallop, Carriage, &c. Kennel-rd.	Keatonston Vestry	Official	Sept. 1
*Brick and Pipe Sewers	Leicester Corporation	R. G. Hawley	Sept. 4
*Alterations, &c. to Buildings at Wick	Admiralty	Official	Sept. 5
* Cottages, Stables, &c. Mortlake	Richmond Main Sewerage Board	H. Mallins	Sept. 6
*Construction of Kingsbridge Railway	O. W. R. Co.	W. Clarke	Sept. 15
*Coach-house, Stable, &c. near Newcastle-on-Tyne	G. G. Taylor Smith, J.P.	David Davies	No date
*Sinking Pit, South Rhonda	Belfast Town Council	Official	do.
*Sewerage, Road Works, and Materials	Churchwicks & Vestry	do.	do.
*Drainage, Paving, &c.	do.	do.	do.
*Heating, &c. Church, Ternon, Ireland	do.	do.	do.
*Filling down and Re-building Stables	do.	do.	do.
*Right House, Barley Field, Leeds	do.	do.	do.
*Warehouse, Basingthorpe, Leeds	do.	do.	do.
*New Stone-built Residence, Lashford, nr. Killybegh	Alfred S. Kirk	Thos. Winn	do.
*Deep Bore-hole	Haywood (Lanark) Colliery	do.	do.
*Chapel, Rhodaryss	do.	E. Curwen	do.

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Borough Surveyor's Assistant	Walsall Corporation	1047	Aug. 18
*Surveyor, Inspector of Works	Walsall Local Board	1800	Aug. 19
*Clerk of Works	Leeds Corporation	Not stated	Aug. 22
*Drainage (Engineering)	Civil Service Commr.	do.	Aug. 25
*Architect (Engineering)	Birmingham Corp.	8207	Aug. 30
*Superintendent of Interception Dept.	Civil Service Commr.	Not stated	Sept. 9
*Assistant Surveyor of Buildings, Ireland	Civil Service Commr.	do.	Sept. 9

Those marked with an Asterisk (\*) are advertised in this Number. Competitions, pp. iv. Contracts, pp. iv. and vi. Public Appointments, xviii.

HENDON.—For repairs to the "Lead of Hay" public-house, for Mr. Henry Hall, architect, Doughty-street, W.C. —  
Camfield, Hendon (accepted)..... £150 0 0

HENDON.—For alterations at the Hyde Brewery, for Mr. Henry Hall, architect, 19, Doughty-street, W.C. —  
Camfield, Hendon (accepted)..... £128 0 0

KINGSTON (Devon).—For the erection of five gables, for Mr. Raymond. Mr. S. Segar, architect, wton Abbot. —  
James Vealley, Newton Abbot..... £469 0 0  
F. W. Cook, Bishopstoke..... 350 0 0  
F. W. Cook, Bishopstoke..... 347 12 0  
F. Barrow, Newton Abbot..... 338 5 0  
R. Yeoman, Kingston\*..... 280 0 0  
\* Accepted.

ONDON.—For re-building Nos. 426, 428, and 430, Lowry-road, N., for Messrs. B. Davies & Co. Mr. H. Smith, architect, 17 and 18, Basinghall-street, Quantities by Mr. B. G. Thompson: —  
W. Brass & Co..... £3,747 0 0  
Woodward & Co..... 3,735 0 0  
Holliday & Greenwood..... 3,721 0 0  
Turtel & Appleton..... 3,699 0 0  
H. J. Williams..... 3,698 0 0  
Watman & Fotheringham..... 3,697 0 0  
Pattman & Fotheringham..... 3,625 0 0  
Allen & Sons..... 3,578 0 0  
C. F. Kearley..... 3,565 0 0

ONDON.—For proposed alterations, "St. Mary's ch," Balham. Mr. W. Newton Dunn, architect: —  
Dove Bros..... £2,876 0 0  
Allen & Sons..... 2,672 0 0  
Smith & Sons..... 2,547 0 0  
G. Candler & Sons..... 2,323 0 0  
Pearson Bros..... 2,304 0 0  
J. Carmichael..... 2,185 0 0

ONDON.—For paviors' work, repair of pitching, &c., Ball's-pond-road, for the Vestry of St. Mary, ington. Mr. J. Patten Barber, C.E., Surveyor: —  
Geo. Ratty..... £2,662 10 0  
Hy. Andrew..... 2,233 8 4  
J. Blagden..... 2,147 10 0  
Wm. Griffiths, 283, Kingsland-road, E. (accepted)..... 2,114 7 6

ONDON.—For the erection of lock and wall wards at London Workhouse, Westmoreland-street, for the St. Xavier's Union Guardians. Messrs. Jarvis & Son, architects, 29, Trinity-square, Warwick, S.E.: —  
Messrs. & Co..... £1,965 0 0  
J. Williams..... 1,917 10 0  
Clark & Randall..... 1,900 0 0  
Longley & Co..... 1,780 0 0  
W. Downs..... 1,737 0 0  
T. W. Castle, Southwark\*..... 1,699 0 0  
Kilby & Gayford..... 1,630 0 0  
Marland..... 1,615 0 0  
Blyton..... 1,597 0 0  
W. H. Castle, Southwark\*..... 1,593 17 10  
L. Holloway..... 1,537 0 0  
Athwaite & Son..... 1,465 0 0  
\* Accepted.

NDON.—For enlargement of "The Star" Tavern, rect and City-road, E.C. Mr. R. A. Lewcock, architect, 38, Bishopsgate-street Within: —  
adair & Wardrop..... £2,734 0 0  
Goodall..... 2,665 0 0  
Oller..... 2,494 0 0  
Oller..... 2,348 0 0  
Oller..... 2,345 0 0  
Iver & Richardson..... 2,298 0 0  
Oller..... 2,240 0 0

LONDON.—For alterations and additions to "The Three Stages" Tavern, Lambeth-road, S.E., for Mr. John German. Mr. Alfred Wright, architect, 61, Kensington-road, S.E.: —  
Drew & Cadman..... £2,376 0 0  
William Smith..... 2,369 0 0  
Canning & Mullins..... 2,255 0 0  
Burman & Sons..... 2,186 0 0  
Frederick Voller..... 2,185 0 0  
Peacock Brothers..... 2,185 0 0  
J. Terman..... 2,170 0 0  
Gould & Brand..... 2,040 0 0  
J. Beale..... 1,981 0 0

LONDON.—For alterations to St. Mary's Mission-room, Hornsey Rise, N. Mr. Geo. Wymouth, architect, 22, Moorgate-street: —  
Southcott & Co..... £456 0 0  
L. H. & R. Roberts..... 437 0 0  
G. S. Williams & Son..... 415 0 0  
J. Langham..... 366 0 0  
Lown & Son..... 357 0 0

LONDON.—For constructing manholes and the supply and fixing of flushing-tanks in connexion with drains at the North-Western Hospital, Haverstock Hill, for the Metropolitan Asylums Board: —  
W. Frost, New Southgate..... £510 0 0  
A. & W. Gavan, Peckham..... 496 0 0  
W. Pearce, Hampstead..... 384 10 0  
Godson & Sons, Kilburn..... 333 0 0  
Wall Bros., Kentish Town (accepted)..... 299 0 0

LONDON.—For alterations to premises, 73, East India Dock-road, Poplar, for the East London Co-operative Society. Messrs. J. & S. F. Clarkson, architects, 116, High-street, Poplar: —  
J. R. Hunt..... £204 0 0  
G. Barker..... 749 0 0  
S. Salt..... 697 0 0  
G. Linn & Son..... 697 0 0  
D. Gibb..... 397 10 0

LONDON.—For addition to the offices at the Deptford Cemetery Lodge, Brockley-road, S.E., for the Deptford Burial Board. Mr. John Jas. Downes, architect, 11, The Parade, Lewisham High-road: —  
Scholfield..... £163 0 0  
Holloway..... 102 0 0  
Leng (accepted)..... 94 0 0

LONDON.—For alteration and addition to 111, High-street, Deptford, for Mr. Nohmann. Mr. John Jas. Downes, architect, 11, The Parade, Lewisham High-road: —  
Leng (accepted)..... £242 0 0

LONDON.—For the erection of four dwelling-houses, with shops, at Cobble Farm-lane, Blackfriars, for Mr. James Murray. Mr. John James Downes, architect, 11, The Parade, Lewisham High-road: —  
Lorden & Son..... £3,330 0 0  
[No competition.]

LONDON.—For reconstructing the floor and front of warehouse at York-street, Blackfriars, for Mr. Messrs. James Clark & Son. Mr. John James Downes, architect, 11, The Parade, Lewisham High-road: —  
T. Dowling..... £520 0 0  
T. Leng..... 416 0 0  
F. W. Falkner..... 373 0 0  
Lorden & Son (accepted)..... 371 0 0

LONDON.—For painting and re-decorating offices, corridors, &c., Nos. 10 and 11, Mincing-lane. Mr. H. C. Boyes, architect: —  
Suewin Bros. & Co., Upper Captain\* £216 0 0  
\* Accepted.

LONDON.—For new building and counter at the "Red Lion" Tavern, High-street, Borough. Mr. R. A. Lewcock, architect, 38, Bishopsgate-street Within: —  
J. Warner..... £183 0 0  
T. Heath (accepted)..... 181 0 0

LONDON.—For alterations at "The Weavers' Arms, Stamford Hill. Mr. R. A. Lewcock, architect, 38, Bishopsgate-street Within: —  
Todd..... £1,140 0 0  
Goodall..... 1,120 0 0  
Voller..... 988 0 0  
Oller & Richardson..... 968 0 0

LONDON.—For sanitary work to be executed at the Paddington Vestry Hall, Harrow-road: —  
Tyler & Sons..... £426 0 0  
Seward & Co..... 210 0 0  
J. Martin..... 198 6 0  
Wenham & Waters..... 163 0 0  
G. Jennings, Palace Wharf, Lambeth 137 0 0

LONDON.—For painting, decorating, &c., to South Hornsey Board Schools, for the Hornsey School Board: —  
Coulthard..... £290 0 0  
Burton & Son..... 819 15 0  
Dixon..... 617 0 0  
Wall Bros..... 576 0 0  
Tillbrook..... 537 0 0  
Matlock Bros. (accepted)..... 531 0 0  
Hurley..... 479 16 0  
Hinton..... 445 0 0

MANCHESTER.—For erecting house at Didsbury, for Mr. R. Philipp. Mr. J. D. Harker, architect, 78, King-street, Manchester: —  
W. Southern & Sons..... £2,560 0 0  
Jos. Davison..... 2,474 0 0  
W. Shaw..... 2,359 0 0  
Owen Williams..... 2,339 0 0  
Burgess & Galt (accepted)..... 2,240 0 0

NEWTON ABBOT (Devon).—For erecting house and shop, Newton Abbot, for Mr. Wm. Shapley. Mr. S. Segar, architect, Newton Abbot: —  
F. A. Stacey..... £675 0 0  
Parker Bros..... 660 0 0  
Wm. Mills..... 659 10 0  
Lewis Bearn (accepted)..... 643 10 0  
[All of Newton Abbot.]

NORTHLEACH (Gloucestershire).—For certain works to the church of Coln Rogers, near Northleach, Gloucestershire, for the Rev. J. Turner. Messrs. Waller & Son, architects, Gloucester: —  
Wall & Hook..... £280 0 0  
W. Newcombe..... 315 0 0  
Mills, Foss Bridge, near Cirencester\* 246 0 0  
\* Accepted.

PEEBLES (N.B.).—For cutting about 1,000 yards of pipe track for drainage, and laying pipes, for the Police Commissioners of Peebles. Mr. R. S. Anderson, Engineer, Crossland-crescent, Peebles: —  
Alex. Fraser..... £346 3 8  
R. C. Breibner..... 276 2 10  
James Shortland..... 202 1 3  
Alex. Smith..... 254 14 10  
James Urquhart..... 237 17 0  
D. McDonald & Sons, Hawick\* 223 3 9  
\* Accepted.

ST. ALBANS.—For erecting parish-room and Sunday school at St. Peter's, St. Albans, for the Vicar and Churchwardens. Mr. F. W. Kinser, F.R.S., architect, 30, Furnival-street, Holborn, E.C.: —  
F. Wise, St. Peter's-street, St. Albans (accepted)..... £660 10 0

SALISBURY.—For alterations to their Head Office, for the Directors of the Wilts and Dorset Banking Company, Limited. Mr. Henry Hall, architect, 16, Doughty-street, W.C.: —  
Matthews, Salisbury..... £1,020 0 0  
Harris, Salisbury..... 893 0 0  
Kite, Salisbury..... 830 0 0  
Webb & Co., Salisbury..... 747 0 0  
Young Bros., Salisbury (accepted)..... 745 0 0

**SALISBURY.**—For erecting a residence in Fowler's-road, Salisbury, for Mr. J. Lander Green. Messrs. John Harding & Son, architects, Salisbury:—  
H. Cooper ..... £1,449 0 0  
Jerrard & Stevens ..... 1,278 16 0  
E. Wile ..... 1,259 4 0  
J. Wort ..... 1,230 10 6  
Webb & Co. .... 1,175 0 0  
G. Harris ..... 1,150 0 0  
F. Tryhorn ..... 1,124 0 0  
F. Dibben ..... 1,112 0 0  
J. Shering ..... 1,100 0 0  
Young Bros., Salisbury (accepted), ..... 1,100 0 0  
E. Day ..... 1,095 0 0  
Crook & Son ..... 1,087 10 0

**SANDGATE.**—For the supply of iron piles, &c., for construction of ten groynes on the foreshore at Sandgate, for the Sandgate Local Board. Mr. W. Lewis Barrett, Engineer:—

S. Finch & Co., Bridge Works, ..... £2,550 0 0  
Chepstow ..... 1,540 0 0  
G. & W. Francis, Folkestone ..... 1,435 0 0  
Alfred Thorne, 145, Cannon-street, ..... 1,435 0 0  
E.C. .... Per Ton.  
J. O. Brettell, Lowesmore Works, ..... 112 0 0  
Worcester ..... 11 0 0  
Pearson & Co., 124, Fenchurch-street, ..... 10 10 0  
E.C. .... 10 10 0  
E. C. & F. Heap, Corporation-street, ..... 9 15 0  
Birmingham ..... 1 4 0  
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# The Builder.

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SATURDAY, AUG. 23, 1890.

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## Landscape Gardening and Park Architecture.



WHAT is the true object of landscape gardening? For very different theories on the subject are possible and have been put into practice, with more or less success after their respective manners. There is the theory of which Le Nôtre was the most eminent practitioner on record, which regarded nature as merely a bare space on which to lay out an ornamental design of the most symmetrical and artificial character; and trees, shrubs, and flowers as merely so much raw material provided by Nature out of which to work the designs of art. On the Le Nôtre system, the natural contour of the landscape was not of much account; or rather, it was thought all the better if it had no natural contour at all, but presented a flat plain or plateau with no excrescences to interfere with the symmetry and completeness of the design. There was the simple English faith of the last century, which regarded the planting of an avenue as the great desideratum, the central expedient for effect compared with which other things were of merely secondary importance. There is that happily exploded idea which aims at the manufacture of the artificial picturesque of a sentimental type; which once prompted misguided persons to build up artificial ruins (which they would gladly have lighted by artificial moonlight if they could have got it), to have a shepherd and sheep in stone on a lawn, and which beguiled Pope into the lowest deep of having rakes and hayforks painted as leaning against the walls of his paddock. There is a more reasonable and practical view which regards landscape-gardening mainly as the means of enhancing the importance of a country house and its approaches, of placing the lodge entrance and laying out the drives in the most effective manner, always taking care that the first view of the house caught from the approach drive is such as to produce a favourable impression on the visitor, as to the scale and architectural

importance of the habitation; that the carriage sweep to the front door is laid out in convenient as well as ornamental lines; that the parterre is arranged according to approved patterns; that the lodge gates are so adroitly placed in reference to a turn of the road that the public road seems at a little distance to be laid out for the purpose of leading up to them,—a harmless piece of mock importance which those who look out for it will find is practised much oftener than is generally supposed, though it is to be feared it hardly produces the effect on the visitor that is intended. This latter may be called, perhaps, the tradesman's view of landscape gardening; the art by which an estate for purchase is set off to the best advantage, and which meets the views of the newly-established country gentleman whose house “pricks a cockney ear” in the distance over its “perky larches and pine,” as the Poet Laureate expresses it.

The artificial system on a great scale, of which Versailles was the climax, has been in this country by common consent abandoned, and is even spoken of with some contempt as a system contrary to nature, and therefore to be condemned. Even in its own day Milton had a fling at it in his description of Eden—

“Which not nice art,  
In beds and curious knops, but Nature boon  
Poured forth profuse on hill and dale and plain;”

a passage the full point of which is lost unless we bear in mind the system against which it was aimed. The objection that this system is artificial, however, might just as well be brought against architecture, which also is a purely artificial art. The creation of a highly ornamental artificial garden on a great scale is really the production of a beautiful and unique form of art and of artistic enjoyment, and the objections to it as a general form of landscape gardening are rather practical than æsthetic. In the first place, when carried out in a sumptuous manner and on a large scale (and it is of little value except on these conditions), it is enormously expensive; and secondly, it is a kind of garden which can only produce its effect and be enjoyed in bright sun-lit summer weather. Nothing looks more blank, more

ineffectual, more at variance with place and season, than a sumptuous ornamental garden in bleak or rainy weather; and considering how the English summer, always short enough, seems yearly to get shorter and shorter, it is not worth the while of any but the few who can afford to keep up a summer and a winter palace on separate estates, to go to the cost of making a grand garden on the artificial system.

Leaving this, then, out of the question, we are left to what has been called the “natural system” of landscape gardening, which consists in the treatment of a site so as to get the best effect out of the natural features of the ground, aided by a system of planting which is really artificial, but which is to be arranged so as to appear more or less natural. It is an exceedingly difficult and delicate point to decide how far this imitative treatment may be carried without degenerating into mere trick and scenic arrangement. There is one principle, however, which may be positively affirmed at the outset, viz.: that all mere attempts at illusion are detestable, and carry their own condemnation with them. The arrangement, for instance, of a piece of standing water so as to imitate the curves of a winding river which has no existence, the introduction of a sham bridge to close the vista and suggest the idea of the continuation of the water beyond it (as at the east end of the Serpentine); all such things are pieces of sheer vulgarity of taste, even in other senses than the artistic one. A lake is a beautiful addition to an estate; but let it appear as a lake, and not endeavour to mimic a river.

The arrangement of plantations and drives is another matter; there is no pretence at deception here, or need not be, for the growth of trees and shrubs has been in the course of ages continually changed by the hand of man over the whole face of a cultivated country, and the very hedges which have been removed to clear the ground for a park were themselves a form of artificial plantation. But in the “natural style” of landscape gardening it must be borne in mind that the habitation is the *raison d'être* of the whole scheme, to an extent which is not the case with the artificial garden on the ancient system. The



symmetrical design of the latter is an object in itself, even if there were no mansion connected with it (though it would no doubt lose its backbone in that case); but the only sense and meaning of the natural system of laying out grounds consists in the relation of the grounds to the habitation which forms their centre. The habitation is itself a production of art—of the most artificial, in fact, of all the arts; placed right in the middle of unsophisticated natural scenery, it will appear in itself unguarded, uncomfortable, devoid of the effect of retirement and repose, while it will also appear an intruder on and out of harmony with the landscape. The business of landscape gardening is to gradually connect the building with the landscape, giving it a *temenos* of its own and arranged so as to promote its comfort and its effect. To this end, even when the natural system is adhered to for the most part, the artificial system may be and in most cases ought to be adopted in immediate contiguity to the house, in order to give a kind of architectural semblance and feeling to those parts of the ground which are immediately contiguous to the architectural centre of the whole. This idea may be carried further, and each portion of the surrounding ground treated in its own appropriate manner, in accordance with the nature of the site and the distance from the habitation, but always so as to unite the whole into one conception.

To do this well requires an eye and an imagination capable of taking a comprehensive grasp of the whole of an extended site, picturing it in the mind's eye as it should be when complete, and treating each portion with reference to the intended ultimate effect of the whole. Something more than taste and experience, something like the intuition of genius, is necessary to accomplish such a task. In this connexion it is worth while to call attention to the spirit in which such work was undertaken by our great English master of the art, Repton, whose remarkable work on the subject, forgotten at present by most of his countrymen, would be well worth re-editing and republishing in a modernised form. Repton was a man of genius in his way; with some ideas which would now be thought a little pedantic and old-fashioned, he had the faculty, so to speak, of generalising a site and forming a broad conception of what could and should be done with it in relation both to the natural characteristics of the ground and the nature of the house, and we should be disposed to say that he was the most capable and brilliant man in his profession since Le Nôtre; a true landscape gardener, and not, like too many of the craft, a mere estate agent.

The great merit of Repton consists in his broad and comprehensive grasp of the whole character and possibilities of a site, in reference to the general section of the land, the existing or proposed style of the house, and the objects for which it was to be used. His work is illustrated in a very ingenious manner by a number of coloured prints with moveable slips pasted to or fitted by slots into the plates, so as to show the view with and without certain characteristics, and enable the reader to compare the two effects. The plates are not first-rate specimens of chromolithography, according to the lights of the present day, but they are exceedingly well contrived for their object, and were so popular an element in the book at the time of its publication as to extract, in a later edition, a remonstrance from the author, to the effect that he had aimed at producing something more than a book of pictures, and had desired to show that true taste in the art "is not a matter of accident but of understanding." In expounding his general view of the objects of landscape-gardening, he continues:—

"In deciding on the character of any place, some attention must be given to its situation with respect to other places; to the natural shape of the ground on which the house is or may be built; to the size and style of the house, and even to the rank of its possessor, together with the use which he intends to make of it, whether as a mansion or constant residence, a sporting seat, or a villa; which particular objects require distinct and opposite

treatment. To give some idea of the variety that abounds in the characters and situations of different places, it will be proper to insert a few specimens from different subjects. I shall begin this work, therefore, by a remarkable instance of situation, only two miles distant from the capital."

In reference to the words "character" and "situation," italicised by the author in the above quotation, it should be observed that he had before said that "the character of a place teaches us what is advisable, the situation, what is possible." The example "not two miles from the capital" is Bransbury House (Brondesbury?) which, "standing on a swelling hill," and with no trees near it, therefore must have home shrubberies, to give retirement and privacy. He proceeds to show, by a very amusing illustration, how this problem would have been met by "Capability Brown," whose idea was in such case to enclose a "home park" round the house by a high paling, shutting out the landscape altogether; and Repton gives a plate showing the inhabitants or visitors at the house endeavouring to get a glimpse of the landscape through the chinks of the paling. Repton's idea is to plant up a much smaller portion of the estate near the house with shrubberies interspersed with walks giving views of the landscape at occasional points, the paling being sunk at these points, and hidden elsewhere by the planting, which can be so arranged "that the twelve acres thus enclosed will appear considerably larger than the sixty acres originally intended to be surrounded by a park pale." This touches upon a most important element in what may be called the poetry of landscape-gardening—the art of so dividing and diversifying a given superficial area by plantations and banks, breaking it up into retired glades, open lawns, and shaded alleys, that the really small extent of the area is entirely masked, and an impression of extent and variety is conveyed which would seem hardly possible to a spectator who saw the bare site in its untreated state. To effect this in so truly artistic a manner as to take away from it all appearance of art or contrivance, is one of the triumphs of landscape-gardening; a triumph, it must be confessed, not very often realised.

The particular reason for planting up close to the house, leaving openings for the distant prospect, in the case just described, was, as Repton observes, that the house stood on an eminence overlooking a wide extent of country. For the reverse case, that of a house in a vale with rising ground all round, Repton's advice is, plant up the heights so as to increase the effect of shelter and seclusion, and introduce water at the low level of the site. This is in keeping with true artistic principle, which should always aim at intensifying those characteristics of a composition which are necessarily the predominant ones. An elevated situation gives the advantage of prospect; make that an element in the laying out of the ground. A low-lying situation suggests seclusion and calm; intensify these characteristics by crowning the heights with wood, and introducing the element of water, with its level surface and calm reflections, as the base of the scene. In connexion with this we may call attention to Repton's acute remark as to the value of water in giving the eye a measuring-point or base-line for the estimate of heights, whether of buildings or of eminences of ground.

Like all writers on the subject, Repton insists on the absolute necessity of the landscape gardener having "a complete knowledge of architecture," and, equally like all others, proceeds to show by his illustrations that he has no such knowledge. There seems to have been no progress made in this direction since Repton, for in Mr. H. E. Milner's work on the subject, just published, the architectural sketches for lodges, boat-houses, balustrades, bridges, &c., are of the poorest and weakest description, whether regarded as drawings or as designs, and form a serious blemish on an otherwise useful book. The author should have taken a competent architect and by

\* The Art and Practice of Landscape Gardening. By Henry Ernest Milner, F.L.S., M. Inst. C.E. With plans and illustrations. London: Simpkin Marshall & Co.; 1890.

draughtsman [into co-partnership in regard to this portion of the work, and he would then have been saved from discrediting his book by drawings which any pupil brought up in a good architectural office or atelier would be ashamed of. Repton, it must be observed, saves himself from some of these difficulties by avoiding for the most part any architectural detail at all; he merely shows houses *en bloc* with an indication of a cornice and a pediment; but on the other hand he shows himself to have had a very good eye and judgment for architectural effect in a broad sense, in connexion with landscape, in his remark that "there are only two characters of architecture, in a broad sense, one perpendicular and the other horizontal"; "call them, if you like," he says, "Gothic and Grecian"; and he adds that "their characters are better distinguished by their general effects than by minute details"; which, from a landscape point of view, is quite true; and he is also quite correct in his remark that "trees of a conic shape" go badly with Gothic, owing to the repetition of line. In this and other respects Repton's remarks on the combination of architecture and landscape are worth study, though his knowledge of architecture in detail seems to have been no better than that of his profession generally.

The question of the avenue is the subject of some passing sarcasm by Jane Austen,\* who represents Repton as a tasteless innovator bent on removing the noble old avenue of Sotherton. But if Jane Austen had, like Repton, been called on to visit numbers of country estates in succession, and found everywhere the eternal avenue, she would probably have recognised that there was more reason in Repton's war against the avenues than she had imagined. He denies, indeed, having any natural antipathy to an avenue, but he says truly that when universally used it reduces all houses to the same landscape, "if looking up a straight line between two green walls deserves the name of a landscape." His objection that an avenue often acts as a "wind-spool" to direct cold blasts on to the house appears more fanciful than real; such an effect may have been noticed under special conditions, but it must at all events be very exceptional; but his æsthetic reasons against it are worth quotation:—

"If at the end of a long avenue be placed an obelisk, or temple, or any other eye-trap, ignorance or childhood alone will be caught and pleased by it; the eye of taste or experience hates compulsion, and turns away with disgust from every artificial means of attracting its notice; for this reason an avenue is most pleasing which, like that at Langley Park, climbs up a hill, and passing over the summit, leaves the fancy to conceive its termination."

This is ingenious: but how when the visitor (as curious persons will) has walked over the hill? Mr. Milner regards the avenue, rightly, as "the expression of grandeur," and it should not, we may add, be made use of except in connexion with an estate and a dwelling of such scale as may rightly pretend to grandeur. To quote Mr. Milner in continuation:—

"It should be planted only when importance is to be given to its line, and when an imposing ending can be bestowed upon it. Its line should be, if possible, straight" [surely an avenue that is not straight is not an "avenue" at all] "and free from extraneous planting, unless indeed it pass through a wood and form part of it. Its trees should be considered as belonging to, and forming part of, the road. It is essentially a stately feature in its appearance; and its purpose should be harmonious with its expression. The mind is apt to resent a paltry result to such promise as it impressively gives, if the ending be unworthy of the beginning. When age and luxuriant growth come on it, there is a veneration in its beauty that is not obtainable by any like means. . . . But when ill-planned—to confuse the vision or the footsteps from some point of little importance to a position of less interest—it bears all the penalty of a wasted resource. . . . It must be remembered that an avenue across a park divides it in two parts at that point. It is not fitting except it proceed from some important entrance on a side entrance, no distant views can be spoiled by its introduction."

This latter caution, as to the effect of an

\* "Mansfield Park."



avenue in cutting the park in two, is also strongly insisted on by Repton.

Mr. Milner's book, by no means exhaustive (for the subject is really an immense one), is to be recommended as a guide to the laying out of estates, except in regard to the examples of architectural adjuncts already referred to. The general suggestions of the introductory chapter are mostly exceedingly good. The author draws attention to the value of intermediate objects in giving scale and assisting the estimate of space and distance (a quality admirably illustrated in the landscapes of Claude, who intentionally places his middle distance trees and buildings so as to give a scale for the distance); he suggests how the idea of spaciousness may be artificially promoted in various ways; he points out how the ground immediately around a dwelling, forming the artificial base on which it rests, should be treated formally and in direct relation to the house. In the chapter on "The Approach" are many excellent hints as to the laying out of the approach drive, in most of which we entirely concur; the direction that "the gradient of a good drive should not be steeper than 1 in 14, though 1 in 9 is a road over which a carriage may be driven with safety," seems to err on the side of steepness; and we may point out (what is sometimes overlooked) that a gradient which is very well to drive down with a four-wheeled vehicle may be felt, both by horse and driver, to be too steep for a gig or dog-cart. "The drive should not skirt the garden or overlook it": an important point for the comfort both of residents and visitors, sometimes forgotten. Any curves in the drive should appear to be rendered necessary by some obstacle: there must be a good deal of *ars celare artem* here, though, if the eye of the observant visitor is to be cheated; and any popularity which such a treatise as this may attain will be likely to have the effect of putting the observant visitor on the *qui vive* for these little artifices: but the author is completely right in his remark that "a straight drive should be used only when an imposing or somewhat pretentious building is at the end of it;" in this respect it is somewhat in the same category as the avenue. We may add a very good caution from Repton, viz.: that except when the house is a mansion of the largest class, the first view of it should not be at too great a distance, otherwise the first impression will be that it is small and insignificant. With a mansion of the largest class, a distant view, subsequently intercepted in the progress of the drive, may have a very charming effect.

The designs and directions for terraced gardens, terraces, and the termination of the drive on reaching the house, savour, we fear, more of the proclivities of the estate-agent than of the artist or architect; but on this head it may be said that Mr. Milner is only in the same boat with all the rest of his profession. It is difficult to define exactly the particular details which mark the hand of the estate-agent, but a mere glance at a plan or a sketch in these cases is sufficient to reveal it. Where an architect who is worth anything is employed on the house, he should be entrusted with all the immediate surroundings also, unless they are to be reduced to mere commonplace in conception and detail.

Where Mr. Milner quits what is (or should be) properly the domain of the architect, and enters on that which is peculiar to the landscape-gardener, we are disposed to regard his *dicta* with general respect. He takes a large view of his subject, as the art of producing natural beauties where they did not previously exist, but in accordance with the opportunities naturally presented by the site. His distinction between the foliage treatment proper to the garden adjoining the house, and that proper to the park, is very well drawn. "Near the house the planting should be finer, and of trees and shrubs that are not indigenous; or rather, such trees or shrubs may be abundantly used there, to produce their effect; for the introduction into a district of plants not indigenous to it marks


an innovation, as it were, and shows the hand of man. Such plants or trees must be sparingly used, or not at all, in the park, where an object is to conceal the fact that all is not due to nature in its local development." The author rightly dwells on the importance of the landscape-gardener endeavouring to realise and forecast, while making young plantations, the effect which these will have when mature. With regard to the various suggestions for arranging the planting in a park, we have no doubt that many of them will aid in producing a good effect; one can quite see, for instance, the force of the recommendation that the outlines of tree-groups should have strong prominences and present deep recesses, and that these recesses will be intensified in effect by being planted with dark-foliaged trees\*; but when it comes to making apparent undulations in the line of a really straight belt of trees by introducing fainter-tinted foliage at intervals, and at the same points *lowering the skyline* to give an effect of perspective, one feels that this employment of optical illusion has only to be detected to be condemned by most spectators. It is well to know how to produce a desired effect of nearness or distance; to remember, for example, that "white foliage, or blossoms, seem nearer to the spectator than they really are"; but after all one feels that one could hardly escape a sense of unreality and *made* picturesqueness as the effect of a good deal of the system recommended by the landscape-gardener; and when the reader is told that trees should be placed in this and that manner, he is often tempted to go down to the roots of things with the impertinent question, "Why should they?"

The practical side of Mr. Milner's book, in regard to the formation of the ground for a new park, the placing of the house, &c., is very good as far as it goes; the scale of the book does not allow of going much into detail. In the chapter "On Planting," the list of trees and shrubs for various situations is very useful; and the two plans and descriptions of executed work (Keszthely in Hungary and Peverey in Shropshire), are much to the point as examples of the manner of setting to work to form a park and gardens on a new site. In the case of Peverey the park was formed on a site consisting previously of purely agricultural land. One difficulty in this case usually is to get rid of the evidences of the old divisions and landmarks; hedges can be easily removed, but it is another matter to root up and remove fine trees which have from time immemorial grown on the lines of such hedgerows. There is always a reluctance to remove such trees, and then there is perhaps the attempt made to plant about them and disguise their formality of position, a process which leads to breaking up the ground into small parts and divisions and thereby losing breadth and unity. At Peverey, the author tells us, "the walks have been undulated in plan as well as in level, and the different parts of the garden are hidden and separated to such an extent that the whole cannot be seen at once, and the former plain field look has been entirely removed."

Park architecture is in itself a very interesting and fascinating subject, to which little justice has been done either in books or in actual building. In the shape of lodges, terraces, bridges, and shelters or summer-houses, it affords the opportunity of considering the ornamental or decorative aspect of architecture only, almost unfettered by practical considerations, and in connexion with beautiful natural (or, if the reader please, artificial) surroundings. Unfortunately, it is not often that the most is made of these opportunities. The great curse of park architecture is the effort to be picturesque, or (still worse) to be "rustic." Mr. Milner tells his

readers that all summer-houses or resting-places in a park should be "rustic"; that bridges should be massive in construction when they carry a main drive, and "rustic" when they carry a garden walk; and he gives a plate of examples of both descriptions. It would be cruel to criticise his "massive" bridge (in Buxton public gardens); the rustic bridges are all right—for that kind of thing. But "rustic" bridges and other erections are in fact the very reverse of good taste; they are pieces of vulgar and foolish affectation. A bridge is an artificial thing; make it as graceful as you can, as an artificial design, but do not try to make it look natural. We will not go so far as to say that we would rather see an iron lattice-girder bridge in a park; but we should at all events feel that it was not a sentimental affectation, as the "rustic" one is. The sooner landscape-gardeners give up this kind of nonsense the better. It is an equal mistake to be constantly struggling after what is called "the picturesque" in lodges and gate-houses; that is to say, designing them with all kinds of angles and elbows and spikes and perforated barge-boards, as if the object were to make them as bristling and angular as possible. The very reverse should be the aim. Architecture is a completely artificial thing, and amid natural foliage its aim should be contrast, not imitation. Where the house and estate are of moderate pretensions only, simplicity is the proper characteristic of the lodge; architectural, not "rustic," simplicity. And when the mansion and property are of a more stately class, so that dignity rather than simplicity becomes suitable in its Park architecture, nothing really allies itself so well with a park landscape as Classic architecture, or a form of a design founded on the lines and feeling of Classic architecture. The great landscape-painters have known this, and grouped Classic architecture with their wooded scenes; but there is no need for this purpose to practise imitation Classic detail. Architecture which combines the qualities of grace, refinement, and repose, is what is needed; Classic elements, but not necessarily Classic detail. Of course, where the mansion itself has a very marked character—a Scotch castle, for instance, with modern additions, the entrance architecture must have some reference to the style of the house; but the elements of repose and simplicity of line may nevertheless be attained, and attempts at a false picturesqueness avoided. It is the object of architectural design in combination with landscape to present a contrast to nature, not to strive after an assimilation with natural forms; and that is just what modern landscape-gardeners habitually forget or ignore.

#### NOTES.

 ENSINGTON GARDENS are the chief playing-grounds of the West-London children; but there is no water fit for them to drink. At the south-east corner there is a small open well, called St. Gover's Well, which a few years ago was reputed to possess medicinal virtues, and was presided over by an old woman. When the Round Pond, situated about 100 yards away, was cleaned out three or four years ago, the well ran dry, and some wooden pipes were found in the mud at the bottom of the pond which were suspected to communicate with this well. Since the re-filling of the pond the water supply has been very much reduced, and in summer it is generally dry, and it can at best be only the drainage of the small plateau of gravel in the centre of which the pond is situated. It is obvious, therefore, that St. Gover's Well no longer supplies the wants of the thirsty children, and it is more than probable that such water as finds its way to it is impure and unfit for drinking purposes. At the south-east corner, near the Italian tea-house, there is a pump which is largely used by children. Quite recently it was found that the cesspool belonging to the tea-house and a public urinal behind it

\* The effective treatment of plantation on a large scale is well illustrated in Gilpin's fine old book on "Forest Scenery," a work deservedly of note in its day, of which a cheap reprint was issued some years ago; but, we regret to observe, without the powerful and characteristic monochrome illustrations of the original book.



was situated close to the pump, and as the soil is gravel, and the well a shallow one, the water is most probably contaminated with sewage. This is really a very discreditable state of things for a Royal park. The parks under the management of Metropolitan authorities are well provided with drinking-fountains, which are supplied with water from a known source, and it should only be necessary to call attention to the deficiency in Kensington Gardens (and, indeed, Hyde Park, the Green Park, and St. James's Park are equally badly off for drinking fountains) to secure a proper supply. The waterworks on Campden Hill are sufficiently near and sufficiently elevated to enable an enterprising and artistic Commissioner to erect some fountains which might be ornaments to the parks as well as useful to their visitors. Even the drinking-fountains in the walls of the pumping-house at the top of the Long Water are not supplied with water, and the cups have disappeared.

**T**HE Select Committee of the House of Commons on the Woods and Forests and Land Revenues of the Crown made their report in the last days of the recent session. We give that portion of the report which refers to the London property of the Crown *verbatim*, as it is very brief. It is somewhat difficult to discover from it whether the Committee do or do not approve of the way in which the Crown property in London has been managed. On the whole, we gather that they do, though they are of opinion that the Commissioners have rather shifted their responsibility on to Mr. Cates's shoulders. It is probable that the public exchequer has benefited by this; but then, what is the good of Commissioners at all? We may perhaps return to this important subject at greater length. Meanwhile the following is the portion of the report referred to:—

"The London property consists in the main of ground-rents, consisting of 237,008l. per annum issuing out of about 4,262 houses, the rateable value of which is at present about 900,000l. a year. The leases of 2,938 of these houses expire for the most part within the course of the next twenty-five or thirty years. At that date the rack-rental of these properties will fall into the possession of the Crown, producing a very large increase of income.

The question has been raised whether it would not be desirable, by periodical renewal of these leases, to anticipate and equalise the growth of the income. Your Committee think that this policy should be very carefully considered by the Commissioners, with a view to promote a gradual increase of income, and to avoid as far as possible a sudden increase at a specific date. The management of the London property appears to be mainly in the hands of Mr. Arthur Cates, and he has practically managed the purchase of ground-rents. Mr. Cates is paid by a percentage and fees; varying in various years from 5,800l. to 2,165l.; out of which he has to provide his office and staff. Mr. Cates does not devote the whole of his time to the service of the Commissioners. The Committee are of opinion that one of the Commissioners should take a more active part in the management of the London property, and that, although he would necessarily be advised by professional authority, larger responsibility should be assumed by him."

**T**HE discussion on the vote for the National Gallery in the House of Commons last week was not interesting. Mr. Cavendish Bentinck attacked Sir F. Burton for giving higher prices in Italy for inferior pictures than would be done by private individuals, and for altering the names of the painters when the new pictures were placed in the National Gallery. Even at the risk of paying a somewhat higher price, we think it is better for the Director to conduct negotiations himself. At the same time, he ought not to be too "squeezeable." There is grave doubt, however, whether the present Director is wise in purchasing inferior pictures in Italy, and whether the best policy is not to wait for the sale of great examples of the old masters which are sold from time to time in this country or abroad. Mr. Cavendish Bentinck would prefer that the money voted from year to year should be kept in hand ready for use when pictures of really great value are in the

market, and we cannot but think there is much to be said for the idea. Nearly all the Continental galleries are depreciated by the number of inferior pictures which are mixed with great masterpieces. Our own National Gallery has hitherto been free from this reproach, and it would be sound policy to add to it only pictures which by a general consensus of skilled opinion are of the highest class. To purchase a picture, as was done this year, as being by Carlo Dolce, and to attribute it in the Gallery to Giovanni Bellini (though many are the critics who do not think it is by this master) is, it must be said, not altogether commendable management. We can do without "doubtful" pictures.

**A**T the present time of year, it may be well to call attention to a case decided during the recent sitting of the High Court of Justice, that of *St. Martin's Vestry v. Gordon*. It was decided in this case that, under sections 125 to 129 of the Metropolitan Management Act, 1855, the ashes and clinkers produced in the furnaces of boilers to supply steam for the general purposes of an hotel must be removed by the Vestry scavengers, as being in the nature of domestic refuse. There is a strong tendency on the part of the scavengers of the metropolis to shirk their business, and this case shows that this disinclination is rather encouraged than checked by their superiors. The fact is, nothing would be more desirable than a society which would look after the proper cleaning away of the refuse of the metropolis, and assist private individuals to keep the *genus* dustman in order. But we fear that numerous and eccentric as are the societies which exist at the present day, it will be some time before this one is established. At any rate, the above decision gives a very wide meaning to the term "domestic refuse," and householders should be encouraged by it to do battle boldly against the dustman.

**I**N Sweden there is at present a certain amount of activity in church building, and more specially so in the restoration of such of its old monuments as are of architectural value; this architectural value, however, being of a very low standard, and the "activity" is perhaps rather shown in the projection of work and the collection of funds than in the actual work itself, which is for the most part carried on so slowly that there is a doubt whether this generation will ever see service resumed in Upsala Cathedral. In the restorations it is to be noticed that details, originally imported and badly carried out by unskilled workmen, are being replaced without improvement; whilst the new works in progress, distinctly leaning towards the German school, are again (excepting in one or two cases) showing this fault of earlier days, —i.e., the imported forms are designed without proper knowledge of the original. This new work, which is generally in brick, and bears a striking resemblance to Professor Otzen's designs which we had an opportunity of seeing this Spring, shows a more liberal use of stone facings than in the models from which it is derived, though in many cases the stone is an artificial one, toned in colour to suit the brick on the exterior or the polychromatic treatment of the interior; and a dull black brick is used instead of the glazed one, which is the favourite material in Otzen's work. At Stockholm the finishing touches are being put to C. Möller's new church, certainly one of the most agreeable modern erections Scandinavia is likely to see for some time to come. At Upsala, the Cathedral restoration already referred to includes the erection of two new spires of considerable height, the entire reconstruction of the roof, and a thorough overhauling of all the brick, stone and stucco surfaces, with all the disadvantages pertaining thereto, these disadvantages being rather too marked in one or two places, especially when one finds iron girders replacing vaults, or a composite stone with its dull blue-grey surface replacing the natural free stone.

**W**E have received from Mr. F. S. Waller, architect of Gloucester, a copy of a quarto pamphlet on Gloucester Cathedral,\* prepared by him with the view of affording some assistance to the Archaeological Institute on the occasion of their visit to Gloucester, but which ought to have a permanent value beyond the occasion. The work is rather architectural than archaeological, and contains notes on the various portions of the cathedral, accompanied by a plan and a number of interesting and well-executed sketches of various portions of the building. Among these the author has hit on the rather novel idea of showing a bird's-eye perspective of the cathedral as it would appear if all work later than Norman were removed, showing at a *coup d'œil* the whole Norman work as now existing. Another interesting sketch is a comparative one of a portion of the choir as left by the Normans, and as cased in the fourteenth century by Abbot Staunton. The thing is exceedingly well done, and all who are interested in Gloucester Cathedral ought to be grateful to Mr. Waller for such an interesting and compact set of notes and illustrations of it.

**M**ESSRS. DOULTON & CO. have now on view at the Lambeth Potteries, Albert Embankment, a terra-cotta reredos for St. John's Church, Notting Hill. It has been designed by Mr. Aston Webb, the figures in the panels having been modelled by Miss Emmeline Halse. The reredos consists of three panels, divided by open piers or pilasters each containing a niche in which is an angel with outstretched wings. The two figures of angels are to a much smaller scale than the other figures in the composition, and their wings project (behind the angle mullions or tracery bars supporting the traceried canopy work above) some slight distance over the background of the centre and side panels. The centre panel, which is higher and wider than the side panels, contains a group of the Crucifixion, with St. John at the foot of the cross. The panel on the left hand side contains a figure of St. John as a young fisherman mending his nets, while in the panel on the right hand side he is represented as an old man writing his Revelations in the Island of Patmos. The panels are surmounted by traceried canopy work of Perpendicular character, and the whole composition is very effective. The architectural portion is additionally noteworthy from the fact that it is executed in Messrs. Doulton's new "cellular" terra-cotta, which requires no filling-in with concrete, and permits of all the ornamental detail being produced, as in the present instance, without moulds, so that every piece of ornament is separately modelled, and no piece is an exact replica of another piece. In addition to this advantage, the mouldings of the main architectural lines of the composition are produced, by means of improved dies, with great exactitude, and owing to the cellular formation of the blocks they are not distorted and twisted in firing, and thus trueness of line to an extent not hitherto attainable is observable in the structure as a whole when it is built up. Messrs. Doulton also brought to our notice a new kind of glazed terra-cotta for architectural work. The glaze is of a dull or matt character, and the surface is slightly granulated in texture. It is quite devoid of the glassy shininess so disagreeable to look at when exposed to the glare of the sun; and as it can be made in a variety of good tints it is likely to be useful in brightening our street *façades*, especially if (as we were informed it is) it can be produced at a moderate cost.

**T**HE International Exhibition of Mining and Metallurgy at the Crystal Palace, even in its unfinished state, includes several exhibits of interest to our readers. As might be expected, the majority of the stalls are devoted to metal and coal mining and appliances, metallurgical specimens, maps, &c.; but we find several accessories, such as ornamental cement work, bricks and tiles

\* J. Bellows; Gloucester.



joinery, wall-papers, &c. Seeing that mining and quarrying are so closely related to each other that in many cases it is difficult to decide on general (though not technical) grounds what constitutes a mine and what a quarry, it is rather remarkable that so few building stones, granites, slates, &c., have found their way into the exhibition. The New South Wales section includes some building stones, marbles, and serpentine. A table inlaid with different varieties of marble from Marulan, Cow Flat, Moonbi Ranges, Kempsey, and other localities, and serpentine from Bingera, are especially worthy of note. There are also several cubes of light-grey and brown Hawkesbury sandstone, which is a good representative building stone of the colony, it having been extensively used in the erection of the principal buildings in Sydney, and is exported to the adjacent colonies. Several Norwegian granites and gneisses, rough and polished, worked up into curbs, pitching, and tombstones, are also exhibited; whilst Portugal sends large slate slabs, some of which are worked into tables, from the quarries near Vallongo, in the district of Oporto. In the British section there is a fine show of Donegal granites, from quarries near Dungloe; these granites are becoming conspicuous features in the market. The exhibit comprises polished pedestals and specimens in red, pink, rose, salmon, and various grey tints of medium and coarse grain. The stones have a splendid polish, and the slightly porphyritic character presented by some of the coarser varieties justly entitles the material to rank amongst the best of our ornamental granites, rendering it a formidable competitor to those of similar nature from Scotland and Cornwall. The Glyn Stone Company show samples of the material from their quarries near Glynceiriog, North Wales. The stone, which is a hard trachyte, has for many years been worked by the Llangollen Highway Board, but has recently been acquired by the Company referred to, which is opening it up extensively. From a knowledge of the behaviour of the material, we are able to say that it makes excellent road-metal and paving; but perhaps the most remarkable thing in connexion with it is that for years it has been used instead of brasses for bearings of machinery in the mills and factories of the district. Its utility in this respect is exemplified by a specimen exhibited which has been in use for years at a neighbouring mill; in some instances the Glyn stone bearings are still in use, after thirty and thirty-five years' constant wear. This is no doubt due to the fact that the material is tougher and harder than the majority of the other igneous rocks in the market. The Pant Glas Slate Company has erected in the exhibition a small shed roofed with the slate from the quarries near Chirk, and also have several loose examples. The slabs, of dark blue colour, are thin, clear, and free from extraneous spots, having a sound metallic ring. The Ormonde Slate Quarries send some rather thick and substantial-looking slabs; whilst blocks of bluish grey, hard "Tam-o'-Shanter" stone come from Dalmore, Ayrshire. The Victoria stone is present in the shape of steps forming a doorway, vases, urns, slabs, pillars, railway-platform coping, &c. The Aqueous Works and Diamond Rock-boring Company exhibits specimens of cores passed through in boring wells and shafts. One specimen was obtained at a depth of 1,100 ft. from the surface in boring for the New River Company at Ware. Speaking generally, there does not seem to have been much attempt at classifying the different exhibits, especially in regard to the British section, a circumstance which, for obvious reasons, is much to be regretted.

FROM a letter in the *Times* of the 16th, dated from the Temple, and presumably by a lawyer, it appears that there is a clear precedent for the demand for compensation for the removal of gates in London streets, which has been declared to be an entirely new kind of claim. Mr. Horne-Payne, the writer of the letter referred to, states that in 1869 the London and North-Western Railway

Company applied for powers to remove the gates then standing across the north end of Euston-grove, in order to make a better access to their station, and that they were granted the requisite powers subject to a special provision that the company should compensate all owners or occupiers whose interests were injuriously affected by the removal of the said gates. It was further provided "that the amount of compensation should be settled by arbitration under the Lands Clauses Act, and that the arbitrator might deal as he thought fit with the costs of any claim which, in his opinion, should be frivolous or vexatious. In pursuance of this Act a number of claims were settled by arbitration for amounts varying from 50*l.* to 150*l.* or 200*l.*, and the remainder by agreement. When the Bill was before a committee of the House of Commons, a precedent for the special compensation clause was found in a Bill passed in a previous Session authorising a Liverpool improvement." This is an amusing commentary on the indignant speeches of Lord Rosebery and Lord Herschell on the claim for compensation for the removal of the still existing Bedford estate gates, as if it were the arbitrary invention of a new and unheard-of species of claim.

THE *Antiquary* for this month describes a method which has been used for fixing the monkish paintings, done under Prior Gondobour in 1484, upon the backs of the stalls (*temp.* Bishop Strickland) in Carlisle Cathedral.\* Subsequent coatings of white-wash were removed in the course of last century; of late years the painting has "scaled" from off the woodwork. By the advice, we read, of Mr. Richmond, R.A., these paintings have been syringed with fine parchment-size, which, by soaking in under the flakes, has secured them to the wood. Our contemporary animadverts upon Sir Arthur Blomfield's design for a lofty new font-cover, to be made, apparently, of wrought-iron, inasmuch as the "traditions [of the Cathedral] are, so to say, of wood-work. The late Mr. Street made a huge mistake in intruding a stone pulpit (the Paley Memorial pulpit) into Carlisle Cathedral." What this really means is, that because there was once a wooden font-cover and a wooden pulpit, which have both disappeared, therefore it is wrong now to make a font-cover or a pulpit of more durable materials. Common-sense will probably side with the architects. In a general sense, however, we may commend the concluding remarks, to the effect that "some opportunity should be given to the inhabitants of a diocese of expressing an opinion on anything that may be proposed to be done in their Cathedral."

IN *L'Architecture* for August 16 is an amusing article by M. Bourdais on what he calls "L'Ingénieursphobie," a malady which he says has been on the increase for a long time, and to which architects are especially subject. It is contagious, and has made immense progress during the year of the Paris Exhibition. Some of the best and most amiable people in the world will become suddenly "méchants et dangereux" on merely hearing the word "engineer." It will not be difficult to recognise in this description the characteristics of a malady which is not unknown on this side of the Channel. M. Bourdais has been occupying himself much with considerations as to the best kind of remedy to apply to check the spread of this disease. He concludes that the method of Pasteur in dealing with canine rabies affords the best example, and that when an architect or a member of a society for protecting ancient buildings exhibits signs of having fallen a victim to this malady, he should, on M. Pasteur's principle, be himself inoculated with a little of the virus of engineering, and

\* Strickland, sixteenth bishop, built the tower and belfry, circa 1405. The paintings: of episodes in the lives of St. Augustine, Anthony, and Cuthbert—are illustrated, with their legends or labels, in Hutchins's "History of Cumberland," vol. II. (1794).

after a due lapse of time he will be found to have recovered his reason, and will regard an engineer with equanimity, and even welcome him as a brother. M. Bourdais signs himself "Architecte, peintre, et musicien, quoique ingénieur"; but if he can justify that signature he must be rather too exceptional a man to be able to enter fully into the failings and temptations of weaker brethren.

# THE GLOUCESTER CONGRESS OF THE ROYAL ARCHEOLOGICAL INSTITUTE.\*

FROM Deerhurst it is by river only about three miles to Tewkesbury, and the members of the Congress reached the end of their voyage, just below the ferry under Tewkesbury Park, at the time arranged, but they had before them a walk of nearly a mile to the Abbey, through heavy rain. As soon as the party were assembled, Mr. Hartshorne read a short summary of the history of the Abbey and an account of its leading features. The following is an abridgement of his paper, taken from the *Birmingham Daily Gazette*. The Abbey is said to have been founded about 715 by Oddo and Dodo, Dukes of Mercia, who endowed it with certain possessions, and established within it five monks and a prior. In the latter part of the tenth century Tewkesbury had become a cell to the monastery of Cranbourn, in Dorsetshire; and in 1083, when Cranbourn passed into the King's hands, the abbot at once set about a reconstruction of the Tewkesbury establishment. In 1087, the honour of Gloucester, which included the lordship of Tewkesbury and the patronage of the monastery, was given by Rufus to Fitz Hamon, who was slain at Falaise, in Normandy. In this nobleman the abbot found a noble patron, and the foundations of a great church were soon laid. On the death of Fitz Hamon, the work was carried on by Robert, Earl of Gloucester, a great man and a great builder, who married Maedel, eldest daughter of Fitz Hamon; and in 1123 the abbey church was dedicated. But it is improbable that the whole church, from the east end to the west front, was finished at this early date. There are indications of certain changes of plan which tend to show that not more than the choir, the *ecclisia proper*, was finished and dedicated in 1123. No doubt the foundations were laid and the work of the nave was advancing to the west in 1123; but much more than this cannot be said, for, in consequence of the extreme plainness of the Norman work, it is not easy to put even approximate dates. The famous west front of the abbey is believed to be of the time of William, son of Robert, Earl of Gloucester, the latter of whom died in 1147. The Decorated work in the choir and the vaulting throughout the church were much and deservedly admired. Directing attention to the tombs contained in the Abbey, which Mr. Hartshorne regards as among the finest in Europe, he said they were divisible into two classes,—those with effigies and those without. In the north side of the nave is the effigy of a man of the middle of the fourteenth century. This has been commonly but wrongly attributed to Lord Wenlock, who was killed at the battle of Tewkesbury in 1471. The figure exhibits some curious points of costume. It wears a pointed bascinet with a camail of banded mail, fastened with a lace in the usual way. Only five examples of banded mail are known in England, this being one of them. The effigies of Hugh Despencer, who died in 1349, and his wife Elizabeth, lie under a magnificent canopy on the left side of the altar. The effigy of the man is tenderly sculptured in white alabaster, and shows him in a round bascinet, which is not characteristic of this period. The fan vaulting of the canopy is very early—perhaps the earliest known. The effigy of Guy de Bryan, who died in 1390, has some features which are rarely, if ever, seen in armour. The mail hose covering the legs is strengthened and protected by splints of steel embedded in it after the Oriental fashion, and there are at regular intervals upon the figure small wooden pegs that have held decorative studs. The whole of the mail has been worked in *geose*, and the field of the arms diapered in the same way. It is recorded that the whole of this effigy has been covered with leaf silver, and painted and gilt in parts. The effigy of Edward Despencer, who died in 1375, represents him kneeling upon a cushion, under a curious canopy on the top of the Trinity Chapel. This figure, Mr. Hartshorne

\* Concluded from page 139, ante.



stated, is quite unique, and is extremely valuable, because it is painted all over to the life, and gives the back as carefully finished as the front. The monument attributed to Abbot Wakeman, the last abbot of Tewkesbury (1531-1539) was described by Mr. Hartsborne as quite a century earlier. "The lively picture of death" has replies crawling over it; which is a very unusual if not a unique feature. There are several plain tombs of abbots and three canopied ones in the south aisle showing admirably the gradual growth of such memorials during about a hundred years. Mr. Hartsborne has also devoted some attention to the painted glass in the choir, and, in the course of an interesting description, said it was unsurpassed in its brilliancy. It was rendered still more interesting by eight military figures in it. They all carry lances, and wear ailettes, and the mixture of mail and plates in their harness fixes the date of the figures to the early part of the second quarter of the fourteenth century, the most important feature of military costume. By closely studying the heraldry on these figures Mr. Hartsborne identified Robert, Earl of Gloucester, Fitz Hamon, four de Clares, a Zouche, and a Despencer, and he is of opinion that they were placed in the Abbey by Eleanor, wife of Hugh Despencer the younger.

Owing to the absence of a guiding spirit and the consequent straggling of the party, very few of the members heard what was said by Mr. Hartsborne and others as they made their perambulation of the nave and choir and the chapels which the latter contains; and the continued downpour of rain prevented all, except a few of the more venturesome, from inspecting the Abbey gateway and the other monastic structures which adjoin the central fabric; but a few were able to take hasty glances at the quaint old bowling-green behind the old "Bell" inn, the scanty fragments of the Abbey cloisters, and other buildings now used for schools. In their way back to the station, in the midst of heavy rain, the party had pointed out to them the two sites of the battle of Tewkesbury,—the one in a field lying a few hundred yards to the south-west of the Abbey, the spot where the luckless Queen Margaret was encamped, and the other in Tewkesbury Park, which lay on their left hand as the party made their way back to the steamer. Here, in what was once a vineyard, and is now known as the "bloody field," the slaughter was heaviest; and here the King fell, while most of his adherents were overpowered and forced down into an arm of the Severn, where they were drowned.

On the return voyage, the weather brightened up, and the party had pointed out to them as they re-passed Deerhurst, the Island of Olney, where in 1016 Canute and Edward Ironside met and agreed to divide England between them. On reaching Gloucester, and having duly dined, they repaired to the Tolsey, where Professor Middleton opened the Architectural Section by a lecture, in which he reviewed somewhat cursorily the progress made in archaeological antiquarian science since the previous meeting of the Institute at Gloucester in 1860, in which the late Mr. Gambier Parry, Professor Willis, and the Rev. C. Hartsborne had taken part. He also drew attention to the great similarity of architectural style which is discernible in all the great churches of Gloucestershire and Worcestershire. Professor Middleton's lecture was followed by another from Mr. John Bellows on "Roman Gloucester." Mr. Bellows is a thorough master of his subject, to which he has devoted years of patient study; and as he has the happy art of expressing himself clearly and popularly, even on a technical subject, his lecture was received with marked attention and by a hearty vote of thanks.

The morning of Thursday, the 14th inst., was devoted to the holding of the annual meeting of the Institute. The secretary (Mr. Heller Gosselin) read the report, and this, along with the accounts, was adopted, on the motion of Lord Percy, seconded by the Rev. Sir Talbot Baker. The report expressed much regret at the loss by death of Prebendary Scarth, Mr. R. Soden Smith, Mr. Charles Roach Smith, and Mr. John Clayton, of Chesters, near Hexham. It showed that, though the number of members has been stationary, yet the financial position of the society is better than it was a year ago. Some of the members suggested that a portion of the life-subscriptions should be funded, instead of being used for the expenses of the current year; and others urged the necessity of carrying on the

index to the Journal of the Society's transactions down to a more recent date. Edinburgh was unanimously chosen as the place of meeting for the Congress of 1890, an invitation having been received from the Society of Antiquaries of that city.

On the conclusion of the meeting, which was held in the Tolsey, the members repaired to the Chapter Room of the Cathedral, where they were received by the Dean, who opened the Historical Section of the Congress with a long and most interesting account of Gloucester, and especially of its ecclesiastical buildings (for of the Castle and its mural fortifications he left others to speak) taking up their history from the point at which Mr. Bellows had left it on the previous evening. He showed that for two or three centuries after the departure of the Romans an historic mist hung over "Gleawestre," under the Saxon domination, when the neighbouring county was ruled over by the petty Kings or Princes of Cirencester, Bath, and Gleva itself. Still even before the Norman Conquest, Gloucester had its palace, and by the middle of the eighth century it had come to be reckoned one of the three noblest cities in our island, second indeed only to Westminster and Winchester. Its importance was increased by the foundation of a religious house here under the dedication of St. Peter, in the century named above, which house was given to the great Benedictine Order in 1022, during the reign of Canute. It is probable that some of the foundations of the Cathedral date from this era; but soon after the Norman Conquest the existing fabric was substantially built, and it is on record that it was solemnly consecrated in 1100 by the Bishop of Worcester, assisted by two other English prelates. The Monastery was largely favoured by Archbishop Anselm, and it continued to grow in wealth and importance until the middle of the sixteenth century, when the heavy hands of Henry VIII. were laid upon it for its suppression. Happily, however, the grand old Abbey Church was preserved, being wanted for a Cathedral; and the result is that we have still at Gloucester an all but perfect example of a Benedictine Monastery, but little changed. The story of the Abbey during our Norman and Plantagenet kings is not very eventful,—at least, not rich in incident; though William the Conqueror held at least one of his *Witanagenots* or Parliaments here, and feasted in the Abbot's Palace, and William Rufus and his brother Robert, and Edward II., and probably several other English sovereigns, enjoyed in turn its hospitality. When Edward II. was so cruelly murdered in Berkeley Castle, the then Abbot showed his hospitality by giving his body that burial which had been refused to it by two at least of his brethren in Gloucestershire and Somersetshire; and this hospitality met with its reward, for in the course of the first century after that King's death, his tomb, which is still to be seen to the north of the altar in the choir, came to be an object of pilgrimage; and it was chiefly out of the oblations which were offered at his tomb, that the grand but heavy Norman pile came to have added to it that wealth of very early Perpendicular architecture which probably was invented within the Abbey walls, and which is nowhere else to be seen so happily blended with the earlier style.

The Dean finished his paper by inviting the antiquarians and architects present to take special note of the details of the crypt under the choir, which they would see in the course of the day; and then a paper was read by the Rev. Mr. Porter on the encaustic tiles of the cathedral and their heraldic devices. This was followed by a discussion on various points of detail in the Dean's lecture, in which Canon Venables, Professor Montagu Burrows, Mr. St. John Hope, and other members of the Congress took part; the Professor, we may add, ascribing the popularity of the tomb of King Edward II. (to whom, he said, history had been most unjust), as an object of pilgrimage, partly to the great fame of that great sovereign, Edward I., his father. After luncheon, the party re-assembled at the Cathedral at 2 p.m., when

Professor Middleton, standing at the lectern in the choir, read a long and elaborate paper on the fabric of the cathedral, taking *seriatim* its Norman nave, its choir and sanctuary, and its windows. He showed how admirably the Perpendicular work had been "dovetailed," so to speak, into the original Norman structure, and with what skill the additional weight of the massive central tower had been met by afterthoughts of construction; and he drew

attention to the great east window, explaining its design and the curious and exceptional way in which it had been coloured. He also mentioned a fact which can scarcely be credited, that only thirty years ago, at the date of the last Gloucester Congress, it was seriously discussed whether this noble window, one of the very finest in England, should not be taken out and superseded by glass of a modern design! He afterwards led the party into the south and north transepts, and through the ambulatory into "Lady Chapel," where he showed the remains of several stone altars still *in situ*, and the defaced and mutilated reredos which in other days must have been almost unrivalled. He afterwards took the party down into the crypt, where opinions were as much divided as ever with regard to its post-Norman or pre-Norman character. The interesting cloisters on the north side of the nave, with their lavatory and carrels of stone, were then perambulated, while some of the more adventurous spirits accompanied the Dean in a walk through the triforium.

As soon as the perambulation of the Cathedral and the monastic buildings was over, the entire party were welcomed to take afternoon tea at the Deanery, where they had the privilege of inspecting the beautiful Norman room now used as the Library, and which formerly was either the Chapel or the Banqueting Hall: at present it is uncertain to which of the two uses it was devoted; for it lies east and west, and as yet no search has been made in its eastern or southern wall for the side of an altar or a piscina. Another room, the panelling of which is Jacobean and is traditionally said to have been put up by Laud, was much admired; and so was a curious bracket on the staircase wall,—it doubtless was used, as it is now, to support a lamp,—and also a fine piece of tapestry in the Library representing Jephthah's daughter.

In the evening the Mayor and Corporation gave, in honour of the Congress, a public conversation and reception in the Shire Hall, in Westgate-street. Here they exhibited the maces and other regalia of the City and of some of the neighbouring towns. These were made the subject of a brief lecture by Mr. St. John Hope, who said that they were of great interest, although not equal to those of London, Norwich, or Southampton, and added that at the time of the Commonwealth all the provincial maces were ordered by the Parliament to follow the type of Oliver Cromwell's "bangle," but that on the Restoration the Royal arms were again replaced. Among the other articles exhibited was a collection of the charters and seals of the city, and some of the city minute books, in one of which is an entry to the effect that the citizens of Gloucester bind themselves to do their best to promote the great General, Oliver Cromwell, to the dignity of Lord Protector, and also to settle on him an income of £5 yearly out of the funds of the city!

At the Friday evening meeting in the great room at the Tolsey, two papers of a general, rather than local, interest were read. The first by Mr. A. Hartsborne, F.S.A., dealing with the rather ghastly subject of the old custom of "Hanging malefactors in chains," a practice which he traced from early times down to its formal abolition just before the accession of her Majesty to the Throne, the last instances of that punishment being inflicted, as we understood him to say took place, in or about 1834. His paper was illustrated by diagrams of various "chains" and "irons," including the noted example in the possession of the Mayor and Corporation of Rye, in Sussex, which was exhibited, a few years ago, at the Leves Congress of the Association. The other paper, by Mr. A. Watkins, treated of ancient pigeon and dove-cots, mostly from South Wales and the Western counties. This, too, was illustrated by photographs after the manner of a magic-lantern, but unfortunately the speaker was not very audible.

Saturday morning was devoted to the reading of two papers of local interest in the great room at the Tolsey, the former being by Mr. Cecil T. Davis, on "The Monumental Brasses of Gloucestershire," and the other by Mr. F. A. Hyett, on "A very rare and curious Civil-War Tract relating to the Siege of Gloucester." Mr. Davis said that he had gone over the Gloucestershire parishes *seriatim*, and that the largest number of such brasses that he could find was eighty-three, dispersed through forty-three churches and one grammar school. In date they ranged mostly from the fourteenth to the sixteenth century, and they might be roughly



divided into ecclesiastical, military, judicial, and civil; and in each of these divisions they bore testimony to progressive change of costume from simplicity to costliness; and this remark, he added, applied to the figures of the ladies as well as to those of their husbands, wherever they appeared on the brass by their sides. Mr. Hyett's paper was one which showed how easy it is even for careful historians to be taken in, and was, indeed, an example of the truth of Sir Robert Walpole's adage, to the effect that history is too often made up of lies. The tract, purporting to give an account, from an eye-witness, of a severe and bloody battle, fought near Gloucester by a Lord Grandison on October 11, 1642, professed also to be printed in London on the 16th of the same month; and it mentioned, among other persons, some whose names were and are unknown in connexion with Gloucester. There can be little doubt that the tract itself is not a forgery, but a fraud, and that it was issued in the hope of keeping up the spirits of the party on whom it conferred a fictitious victory; and, as Mr. Walford, another member of the Congress remarked, the date of its publication in London within five days of the event which it professed to record, in an age when there were no telegraphs or even coaches, and when stage-waggons took some days to reach London from Gloucester, is enough to stamp it as a fabrication. Sir Talbot Baker compared it to the fictitious news of a "great victory" or a "great defeat" which were so often published in the London streets during the Russian War. After a few remarks from the Chairman of the meeting, votes of thanks were passed to the readers of the papers.

After luncheon, the party, over a hundred strong, went off by the Midland Railway for Woodchester, near Stroud, where the remains of the Roman villa within the area of the parish churchyard brought to light towards the close of the last century (though known to exist at an earlier date) was opened for their inspection. Soon after its full discovery in 1797, Dr. Lysons published an elaborate monograph upon this villa, for which he rightly claimed the credit of being the first known to exist in Great Britain; and, though several other examples have since been brought to light in various parts of the kingdom, as at Leicester, in the Isle of Wight, at Limsfield, and at Chesters, near Hexham, in Northumberland, the remark still holds true. The mosaic pavement of its great hall or atrium, for such it must have been, still shows its ornamental borders, and squares and circles, worked in bright red and blue; and the forms of recumbent Bacchanalian figures, coupled with those of tigers and pards above, can leave little doubt on the classical scholar's mind that the hall was intended for festive uses, for among the inscriptions which it bears is one which runs, "Bonum eventum colite," and it will not be forgotten that Horace ascribes to the god "Bacchus" or "Liber" a particular efficacy in this direction, as he writes:—

*Liber vota bonos duci exitus.*

The building in its complete state must have consisted of more than sixty rooms; and in one corner are to be seen, though in an imperfect condition, the means of warming them by flues. The central atrium, which in a warmer climate would have been "hypæthral," was probably here covered in, and the feasters were disposed around its four sides. The house is conjectured to have been a country residence of the Roman prætor or general, and experts consider, from the character of the ornamentation, that it dates from about the reign of Hadrian (A.D. 117), for whose use it may perhaps have been erected during his visit to Britain. The materials of which the pavement is composed are, or seem to be, small pieces of very hard brick, slightly glazed; but Murray, in his "Handbook for Gloucestershire," says that "the tesserae, except the white, are the produce of a hard calcareous stone, bearing a good polish, and resembling the Palombino marble of Italy, found in the vale of Gloucester." It is only at distant intervals that this "Roman Villa" is laid open for inspection, so that the members of the Institute were fortunate in the choice of the date of their Congress, and also that the Rector of Woodchester and his accomplished daughters have done all in their power to illustrate, by drawings and by the publication of a small volume,\* the treasures which they hold in their hands.

\* "The Mosaic Pavement and Roman Villa at Woodchester," by A. G. S. Published by White, printer, Stroud, 1890.

By the time that these lines reach the eyes of our readers the entire villa will have been covered up again for a certain interval of time; ten years have elapsed since it was opened previously, and large bodies of pilgrims from Gloucester, Cheltenham, Bristol, Bath, Tewkesbury, Worcester, and other large towns have seen it during the month that it has been open and "on view." It should be added that on Saturday's visit Professor Middleton gave a brief account of the building as soon as the party had assembled within the enclosure, and that a very general opinion was expressed by the Archaeologists that it would be most desirable, in the interests of architectural enquiry, to lay open further portions of the area once covered by this noble edifice.

Between three and four o'clock the party proceeded from Woodchester in carriages and brakes, through Stroud to Painswick and Prinknash. At the former village the party saw its fine church of the Debased style, but now under the process of "restoration." It consists of two chancels, a nave, a north aisle, quaintly ornamented with gargoyles, chantry chapel, south aisle, and tower, the latter surmounted by a slender spire, which was struck by lightning about seven years since, and had to be rebuilt in consequence. Not far off is the "Lodge," formerly the residence of the lords of the manor; the altar-stone of its old chapel has been formed into the lintel of a pigsty; it bears a Latin inscription as follows: "HOC ALTARE DEDICATUM EST IN HONOREM SANCTI TRINITATIS ET OMNIUM SANCTORUM A NICOLAO EPISCOPO SUPPLAGANEO." Another relic of the old chapel, a window, gives light to the dairy. In the neighbourhood are some picturesque old cottages and farmhouses, some of the sixteenth century, or even older; and a mile off is a hamlet called "Paradise," with a quaint old inn, the "Adam and Eve." On the brow of Painswick Hill is an encampment dating in all probability from pre-Roman times; the mounds here, however, are much marred by the formation of large quarries cut in the hill-side in order to obtain the oolitic freestone so well known in this neighbourhood, and of which a large portion of Gloucester Cathedral is built. Tradition reports that Earl Godwin encamped on this hill; and certainly in later times the Royalist army was here, for a longer or shorter time, on its way to besiege Gloucester, and again in the course of its retreat. The Court-House at Painswick, built in 1604 (see sketch in this week's *Builder*, p. 150), is a good sample of Elizabethan architecture, yet verging into Jacobean. Charles I. held a court here, as is proved by documentary evidence still in existence. The little town of Painswick was formerly of some importance from its woollen manufactures, and near it is another mansion, Painswick House, with a fine mantel-piece in its library, and here is preserved the bed on which Charles I. slept while he was staying at Matson House, near Gloucester. Prinknash Park, the seat of Mr. T. Dyer Edwardes (late the seat of the Ackers family), which the party visited along with Painswick, is one of the ancient, and perhaps the finest, residences of the former Abbots of Gloucester, and stands, according to Murray, "on a glorious but impracticable hill in the midst of a little forest, and commanding Elysium." Though much altered, it retains some of the exterior, and very much of the interior, arrangements of the fifteenth century. It is in excellent preservation, and indeed has never been allowed to fall into disrepair. The chapel was restored partly by the late and partly by the present owners. It is said in the local topographical books that Abbot Malvern made extensive repairs in the fabric about 1520, less than twenty years before the surrender of the Abbey into the hands of the King, and the great dining-hall was built as far back as the reign of Edward IV.; this is confirmed by the fact that its beams bear in their centre the "falcon and fetter-lock open,"—the favourite cognizance and device of that monarch. After seeing the house at their leisure the party returned to Gloucester in time for dinner.

No meeting was held, and so no paper was read, on Saturday evening; and Sunday also was a *dies non*, so far as the Congress was concerned, except that in honour of their visitors the Mayor and Corporation went in state to the Cathedral, where the Dean preached an appropriate sermon. In the afternoon several members of the party made excursions on their own account, some to the ancient encampment at

Uley, near Dursley, while others explored the ruins of Llanthony Priory, or drove out to Matson, Brockworth, and Upton, where they were shown a lock of the hair of Edward IV., which is kept in an ancient locket of gold.

On Monday, as soon as breakfast was over, the party, to the number of about eighty, went by Great Western Railway to Andoversford, to inspect Withington Church, the Roman villa at Chedworth (which was discovered in 1864 or 1865), and Northleach Church. Withington Church is said to stand upon the site of a former and much earlier structure, the foundations of which, at least, must have been Saxon, for it formed the chapel of a convent of nuns established here by Wilfrid or Wilfrith, Bishop of Worcester, in the eighth century, and ultimately annexed by papal sanction to that see. The church is remarkable for its fine tower, adorned with curious gargoyles. It was formerly the burial-place of the Lords Chedworth, a title which became extinct about the end of the last century. From Withington the party drove on to Chedworth, to inspect, under the guidance of Mr. George E. Fox, a Roman villa, which was found here as far back as 1760, but was not really excavated till 1864, when that work was done at the cost of a member of the Farrer family. It is not to be compared, at all events, in beauty, with that at Woodchester, which was visited by the Institute on Saturday, but it consists of two courts, an inner and an outer one, and it contains its triclinium and corridors leading to the living and banqueting rooms, while there is a strong probability that the outer courtyard was intended for the stabling and barns. The special interest in Chedworth lies in the fact that it shows marked alterations in its original plan, and (to use Mr. Fox's own words) "Curious changes made at a late period of its existence, in order to adopt a portion of the building to other than strictly domestic uses." For instance, he remarks, "a series of chambers was inserted in the northern side, apparently appropriated to the object of carrying on the trade of dyeing and fulling." Of the outer courtyard only the northern wing remains, and it consists of a range of chambers, with a corridor running along the front of them; but these contain little or nothing of interest, except the fragment of a composite hypocast. The whole of the western range of buildings, including the triclinium and the *thermae* or baths adjoining it, can be made out by an observant eye. The triclinium has still the imperfect remains of a mosaic floor, decorated, as usual, with squares and braided borders, and with Fauni and Bacchantes in the intermediate panels; and in the corners are the presiding genii of the Four Seasons. Unfortunately, this pavement has been much damaged by the roots of trees, which have been allowed to grow between its once elaborate tesserae, and probably also by fire, as traces of ignition are apparent upon its surface. The rooms in this villa were about thirty-eight or thirty-nine. The following paragraph is in the words of Mr. Fox:—

"Not forming part of the villa itself, but attached to its wall of *enceinte*, at the extreme north-western corner of the site is a semicircular recess, formed in the steep ground of the hill-side, with dwarf walls prolonging the apse on either hand. The enclosed space contains a little reservoir of water, still full, and still flowing as in the old Roman times; and amongst the mass of stones and earth which concealed the spot up to the time of its discovery, lay a little altar. . . . Above this site, in the woods, was yet another building, of which but little more than the foundation remains. This was without doubt, the place of sepulture of the inhabitants of the villa. An unusually large number of fragments of architectural details is to be found on this site, either placed on the ruined walls or half buried in the turf. . . . Amongst the most interesting of the contents of the museum which has been collected and arranged just outside the villa, may be mentioned three examples of the sacred monogram, X.P., rudely scratched upon stones which appear to have served as steps to the fullers' court in the western angle of the villa."

We may be allowed to add here our own appreciation of the Museum, and assure our readers that the numerous objects of Roman art which fill its cases are well worth study, as they will assist the visitor in forming correct ideas about a time and a civilisation removed from us by many centuries, and so like in many ways, and in other ways so unlike, our own.

It was with regret that the party quitted Chedworth, but the inexorable bugle gave notice that it was time for them to press on to Northleach, where a handsome parish church (see our illustrations this week) awaited their visit. Here they found an interpreter in the Rev. J. W. Sharpe, a short notice from whose



pen was placed in their hands. The church, as it now stands, is of the latter half of the fifteenth century; but it stands on the site of one of far earlier date, for Sampson, Bishop of Worcester, granted it, with its tithes, to St. Peter's Abbey, at Gloucester, and Pope Innocent III. confirmed the grant. It now consists (see plan on p. 148 of this week's *Builder*) of a large nave with north and south aisles, a chancel with side chapels, a western tower, and one of the very finest and most richly ornamented south porches in the kingdom. The porch bears in niches figures of the Trinity, the Virgin Mary with the infant Christ on her knee, and other saints; and on the buttresses are niches for others. The symbols of the four Evangelists, though much defaced by time, are still to be discerned on the weatherings of the buttresses. The roof of the porch is richly groined, adorned with bosses, and studded with heads of angels and saints. The windows, especially those in the south aisle, have still some rich painted glass, and amongst the saints figured on it is St. Lawrence. At the east end of this aisle is an elaborate reredos, which has been much battered; but the sedilia in the chancel are in a better condition. The old altar steps remain in the north aisle; and among the devices here are to be seen the arms of Beauchamp, and the badge of the bear and ragged staff of the house of Leicester. The nave is fine and spacious; it was beautified, if not rebuilt, by John Fortey, a rich woolstapler of the town. It is of five bays; the pillars are lofty, with depressed arches. A small ogee bracket balances the caps under the soffits of the arches. In the second bay on the north, as at Campton, are semi-caps, to carry, perhaps, a canopy, as at Burford, in Oxfordshire. The pulpit is of stone. The clearstory is a transparency of large pointed windows; in the east end is a broad elliptical window of nine lights. The parapets outside are embattled with diagonal pinnacles, which rise from square crocketed buttresses, one to each embattlement. A figure of John the Baptist, the patron saint of John Fortey, occupies an elegant canopy in the eastern apex. The angle buttresses of the chancel have fine niches, and the remains of rich sculpture on the weatherings. The tower is a grand and massive pile, in four stages. The heavy windows are flanked by sculptured compartments, pedimented, plain, and crocketed. Lofty as is the tower, yet there are to be seen inside preparations for a contemplated spire. The lower portion of the tower is, in fact, a lantern, lighted by a large double-arched window. In the groined stone roof are carved the heads of a king, a queen, an abbot, and a civilian. The altar-cloth is made up of several magnificent copes, which were preserved entire until within the last few years. It is interesting to learn that the old stone slab of the high altar has lately been discovered, marked with the five crosses which denote its original consecration; it measures 10 ft. by 3 ft., and is over 3 in. thick. The church contains no fewer than eight old brasses—one to a priest, and the others to the Forteys and other woolstaplers, who built the fabric out of, let us hope, their honest gains.

The above remarks are extensively abridged from Mr. Sharpe's notes, and it is to be hoped that the efforts of the late and present vicars for the repair and conservative restoration of this church may be successful.

At the concluding meeting, held in the great room of the Tolsey on Monday evening, the Rev. Sir Talbot Baker was in the chair, and he said that in consequence of the death of one of the members of the Congress (Mr. H. Ross) the Council would not, as a Council, take part in the proceedings of the last day of the meeting, but would leave it to individual members to go to Berkeley Castle or not, as they pleased. The usual votes of thanks were proposed—to the Mayor and Corporation, to the Bishop and the Dean of Gloucester, to the officers and members of the local Archaeological Society, to those gentlemen who had kindly read papers or delivered lectures, and finally to the President of the year, Sir John Dorington, for the able and excellent address with which he had inaugurated the proceedings of the Congress.

On Tuesday, soon after breakfast, with slightly diminished numbers, but still nearly eighty strong, the party went over by train to Berkeley, where the Rev. Mr. Bazeley had promised to act as their guide and interpreter by reading a paper on the history, antiquities, and architecture of that noble building; but as Berkeley Castle is so very generally known to

all travelled Englishmen, it will not be necessary to give more than the briefest outline of what he said. He ascribed the foundation of the castle, situated on a strong plateau, which is nearly surrounded by meadows and lowlands, to Fitzhardinge, said (but by a doubtful tradition) to have been a scion of the Royal house of Denmark, but certainly a companion-in-arms of William the Conqueror. The Fitzhardinges intermarried with the Berkeleys, and on settling down at this castle, took the local name, and the manor, estate, and castle have since then passed down through twenty-six generations of Berkeleys to the present owner, Lord Fitzhardinge. Mr. Bazeley then described minutely the outer walls, with the moat, now dry, giving the measurements of the area contained in them, and also of the quadrangle,—if the inner court, so irregular in its ground-plan, can be so designated. He gave also the measurements of the great hall, of the kitchen, of the keep, and of the semicircular towers by which it is flanked, and of the tower in the rear, the muniment-room, the chapel, &c. He also gave a list of the nineteen principal portraits with which the hall is adorned. He failed, however, to draw attention to the fact that the great fireplace stands in the very unusual place of the top, instead of at one side, of the hall,—an arrangement which can only be accounted for by the narrowness of the spaces between the windows on either side. The chapel, which is very small in proportion to the hall, was much admired on account of the quaint old pew at the western end, with its carved oak work, and the confessional,—for such it undoubtedly is, or, rather, was,—hollowed out in the southern wall. The party then inspected the buttery and kitchen; and were shown a deep dungeon, now a dry well, in one of the towers; and also the chamber in which, if tradition speaks truly, the unfortunate Edward II. was so cruelly and barbarously murdered by the hands of the two knights, his custodians, Maltravers and Gurney, at the instigation of the Queen-Mother, Isabella, "the she-wolf of France," and her paramour, Lord Mortimer. Some of the party also ascended the keep, and enjoyed a walk upon the leads, following the track of the Warder's walk, from which they obtained a good view of the general plan of the castle, and also of the surrounding country, with the Severn, and the Monmouthshire hills beyond it. A vote of thanks to Mr. Bazeley was passed by the party whilst assembled within the walls of the keep. In the great hall there was put out in cases for their inspection a very good collection of ancient charters relating to Berkeley, mostly along with their seals, in good condition; beside them were the maces of the towns of Berkeley and Wotton-under-Edge, which were pronounced to be of more than average excellence for places so small in point of population. A gentleman from the British Museum offered the party a few remarks on the charters; but, like too many lecturers on such occasions, he was almost inaudible, and his hearers accordingly straggled off in different directions.

After luncheon, an hour was devoted to an inspection of the handsome Early English parish church which adjoins the castle, and which has, in the opinion of some who were present, been rather "over-restored" by Sir Gilbert Scott. It consists of a fine and spacious nave, chancel, and side aisles; and the choir is separated from the nave by a noble stone screen, richly carved. At the end of the nave, in front of the pulpit, the party had shown to them the fine monument of Thomas, second Lord Berkeley, and of Margaret, his wife. The figures are carved in alabaster, and lie recumbent on a large and handsome altar-tomb. The rest of the church does not call for much remark, except for the curious position of its tower, which is situated in the churchyard at a distance of some 70 ft. or 80 ft. to the north of the north porch. It was rebuilt in 1790 on the old lines, but not very successfully, as the details of Gothic architecture were not well known at that time. Its appearance, therefore, is scarcely satisfactory to the eye of an ecclesiastical architect, though it is good for the age in which it was rebuilt. The previous tower stood in the same spot, but it had become impaired, and the present replica is the result. It was mentioned by one or two of the party that the church tower occupies a similar isolated position at Beccles, in Suffolk; at Elstow, in Bedfordshire; and at Magdalen College, Oxford.

The return journey to Gloucester, early in the

afternoon, brought to an end a Congress which, in spite of one sad incident, has been a most pleasant and successful one.

#### HALL FOR THE CHORAL SOCIETIES' FESTIVAL IN VIENNA.

THE accompanying plan and two sections represent the temporary building which has been erected at Vienna for the fourth Festival of the Deutsche Sängerbund (German Choral Societies' Union), which was held, with every evidence of Teutonic enthusiasm, on Saturday and Sunday last. They have been forwarded to us by the architect, Herr Herrmann Otte, and, though unfortunately on too small a scale to show the details of construction and design, they indicate the principles on which the hall has been planned and constructed, and may be of some interest as an example of a class of structure in which the German architects excel us,—partly, perhaps, because they are more often called upon to exercise their talents in this way. We are not aware at what intervals of time the German Choral Societies' Union hold their great Festivals,—we observe that this is the fourth of a series; but such meetings of combined choirs, for part-singing on a great scale, have been for many years a favourite form of musical function in Germany. In the present case provision was to be made for a chorus of no fewer than 8,000 persons, a kind of thing of which we have no experience in England on the same scale,—our Handel Festival chorus, which is a quite exceptional gathering, amounting to only 4,000 singers.

The architect, it will be seen, has adopted the form of a long room rounded at both ends. The rounding of the seats for the singers is to a certain extent a necessity, in order that they may hear each other and may be all equally within sight of and under the control of the conductor; but we doubt whether it would not have been better to have had a segment of a circle only instead of making a complete semicircle and continuing the seats to some extent in a straight line facing each other. The singers occupying this portion of the seats would really be singing at each other and not at the audience. Nor do we recognise any practical advantage in making the opposite end of the auditorium of a similar curve; in the case of a solid-walled building there would be a distinct disadvantage in this, inasmuch as it would focus an echo on the portion of the audience around the centre of the circle; in a timber building like this, with so many projections in the way of roof-timbers and story-posts to break up the sound, this echo would probably not be very perceptible, whatever were the form of the end plan of the room; and no doubt the circular end has a finer appearance and leads to a more symmetrical architectural treatment both internally and externally; but that is its only advantage.

The following descriptive particulars were forwarded to us along with the engravings:—

"The Committee decided on erecting a hall capable of containing 20,000 persons for the Choral Festival to be held in Vienna this summer, and tenders were solicited for the design and construction of the building. Among the six offers received, the selection fell on the design submitted by Herr Herrmann Otte, architect, of Vienna, to whom the construction was entrusted on an estimate of 65,662 florins. The building material will remain the property of the contractor.

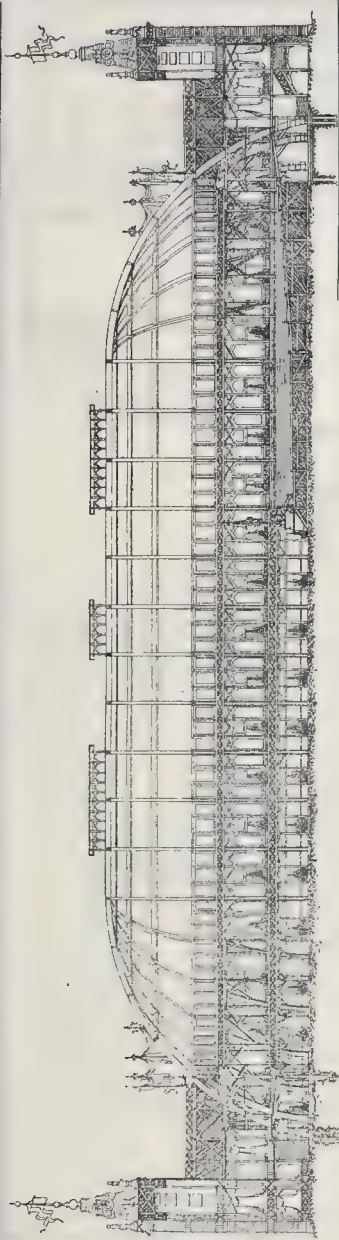
The hall, with its semicircular ends, is 116 metres long, 56 metres wide, and 23 metres high in the centre. The hall will be formed of combined semicircular plank ribbing secured into the ground.

The manner in which the plank ribbing is put together and the construction of the profiles, are quite new. The plank ribs (or arches) are thrown over the entire span, and only receive some additional support from the side columns which carry the gallery.

In consideration of the great capacity of the building, forty-five passages, each 1.60 m. wide, are provided on both sides, and radiating towards the narrow sides, so that the public, when leaving the hall, can reach the outlet by the shortest way. In the same manner one can pass from the gallery to an open balcony, 4 metres in width, which surrounds the whole

\* We received also a pictorial view of the exterior of the building, but the engraving was too coarse in execution to be suitable for publication here.





hall, and whence wooden steps, 3 mètres wide, lead to the ground.

The orchestra, for 8,000 singers, rises on three sides from the conductor's desk, and is formed in somewhat the section of a basin. Under this is placed the refreshment-room for the singers. The dressing-rooms are in the three portals, and the lavatories in outhouses, which are connected by a passage with the hall.

Small beer buffets are situated under the landings, while the large refreshment room is placed at the back on the long side of the hall, and is 50 mètres in length. Behind this are the offices.

The tuning-rooms are on the first floor of the portal adjoining the tribune. The band which plays during the intervals between the songs is

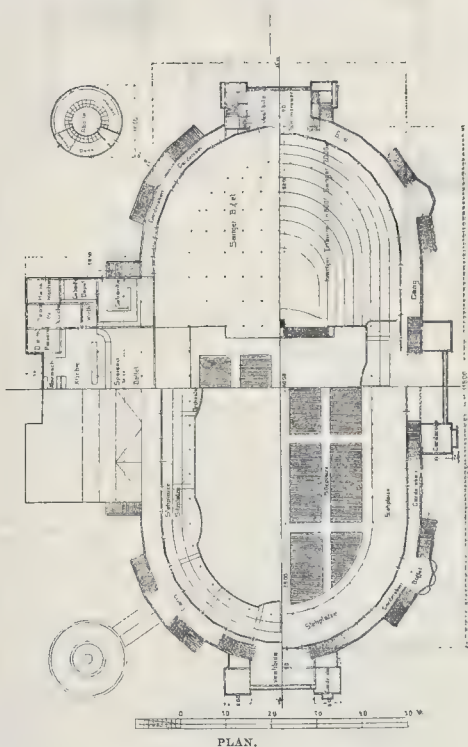
placed in the gallery opposite to the main entrance of the long side. The gallery for the flags runs all round the hall above the spectator's gallery.

The building is lighted by large lateral openings, which are covered with white painted material, in order to subdue the light. The ventilators are at the highest point of the roof.

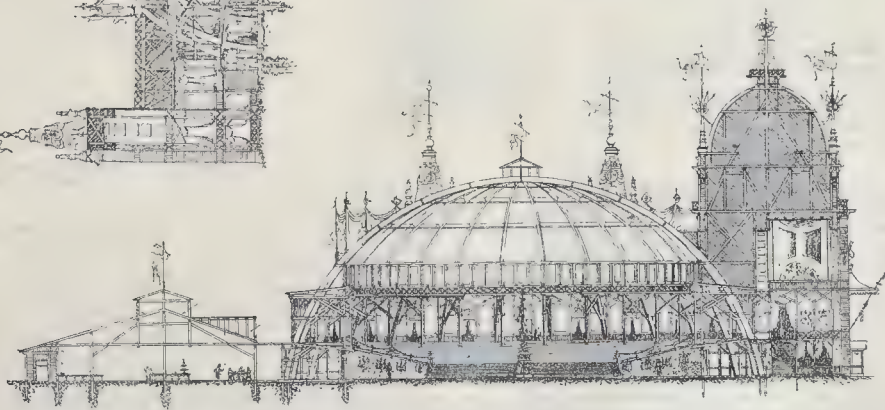
The inspection rooms for doctors, the police, fire, and safety brigades, also offices for the committee, post, and telegraph, are arranged in two small buildings outside the hall.

The grounds are surrounded on three sides by a hoarding, and on the fourth, towards the "Prater-Allee," by a railing, in the middle of which is the entrance, with twelve ticket-takers' boxes and turnstiles. The hall and grounds are lighted by electricity."

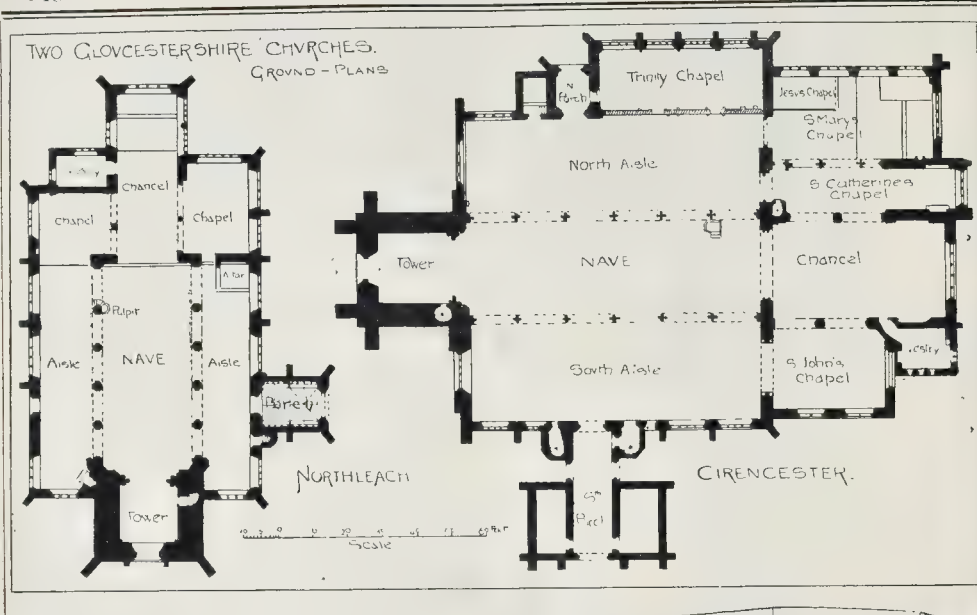
LONGITUDINAL SECTION.



PLAN.



CROSS SECTION.



### Illustrations.

#### SCULPTURE FROM THE SALON OF 1890.

**T**HE two works in sculpture illustrated this week were both among the fine collection in the Paris Salon of this year, and were mentioned in our article on "Some Sculpture of the Year" in the *Builder* for May 31 last.

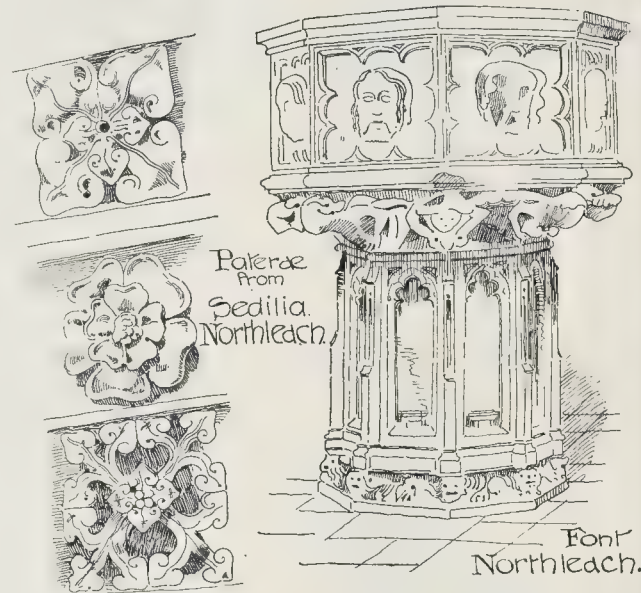
M. Marqueste's group, "Perseus Slaying the Gorgon," is a highly-finished work in marble which occupied a central position in the exhibition, and was purchased by the State. Perseus is represented as grasping Medusa by the snaky hair, in order to keep her deadly countenance away from him while he prepares to decapitate her. Both figures are finely modelled, that of Perseus being full of calm and conscious power. The helmet on his head is a beautiful bit of decorative design.

M. Levasseur's work, "The First-born," was a plaster model which occupied a position among a row of remarkable works at one side of the sculpture court, under the gallery. The motif of the work is a very old one, which has often afforded a subject to sculptors; it is remarkable for the fine and harmonious composition of the three figures, which is still better seen from a point of view rather more to the right of the group: the photograph from which our illustration is produced has been taken rather too much in front, and foreshortens the figures of the mother and child more than is desirable; but from the peculiar composition of the work it is rather difficult to find any one point of view which is altogether satisfactory for photography.

#### TWO GLOUCESTERSHIRE CHURCHES: CIRENCESTER AND NORTHLEACH.

NORTHLEACH CHURCH has been visited by the Royal Archaeological Institute during the Gloucester Congress which concluded on Tuesday last, and we give in the present number the ground-plans of it and of Cirencester Church, and some views illustrative of the principal points of interest in each. Both churches were referred to by us in our leading article on the neighbourhood of Oxford last week, and we then drew attention to them as in some ways possessing points of resemblance to the large churches of Barford and others in the west of Oxfordshire.

The church at Northleach is almost entirely Perpendicular in style, and is chiefly remarkable for its lofty western tower and magnificent south porch. Both these are shown in our plates. There is also a good font, and an ex-



cellent pulpit, and the delicate paterae on the sedilia should not be overlooked (see sketches).

At Cirencester is another large porch,—so large, in fact, that one of its upper rooms was used as a town-hall. The church itself is very spacious, and has a particularly noble nave. Here, too, is another pulpit, of somewhat curious design. In the eastern part of the church we find traces of an earlier building, and we give a drawing of a fine Early English cap, which forms the central feature in the arcade dividing the Chapel of St. John from the chancel.

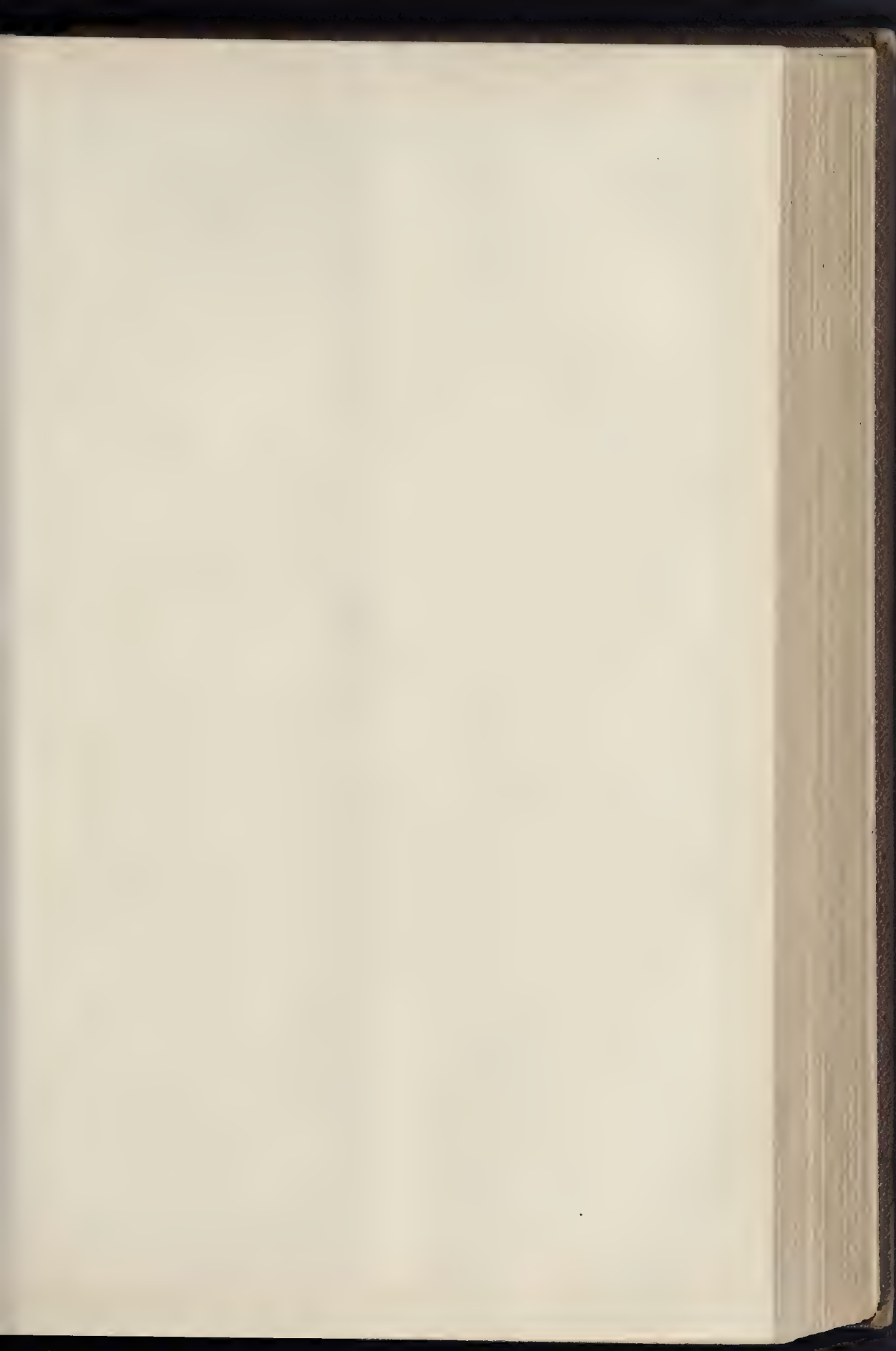
There are some interesting caps at Deerhurst church, showing the development of the Early English foliated cap from the Norman cushion form, and two examples are here given. An account of some of the places in the county will be found in the *Builder* of January 29, 1887, in which also occurs an illustration of the Saxon chapel and picturesque house adjoining, which formed one of the points of interest during the Institute Congress. A view of the exterior of

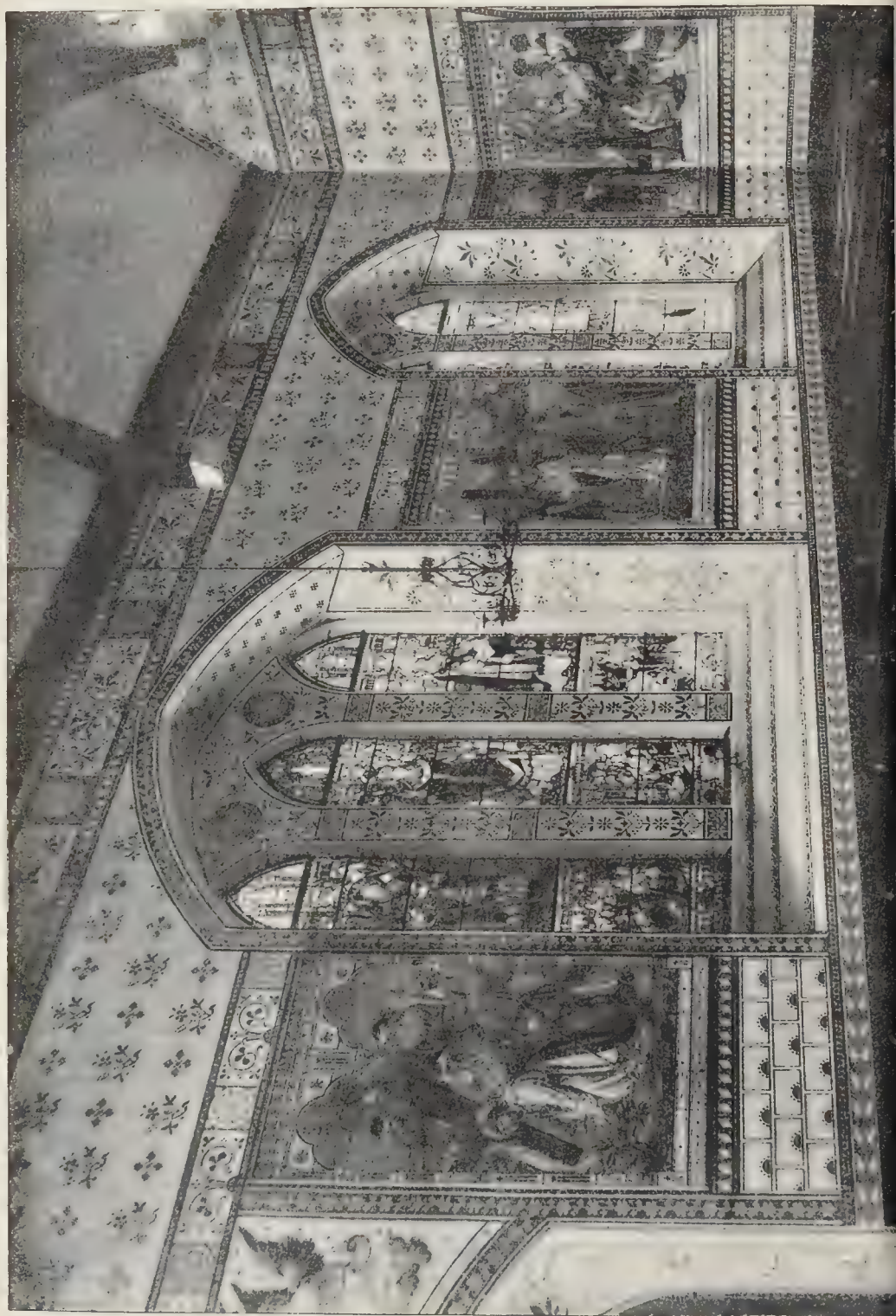
Tewkesbury Abbey was given by us January 29, 1887, and two tombs from the interior on December 18, 1886.

#### DECORATION AND GLASS, FOLKESTONE PARISH CHURCH.

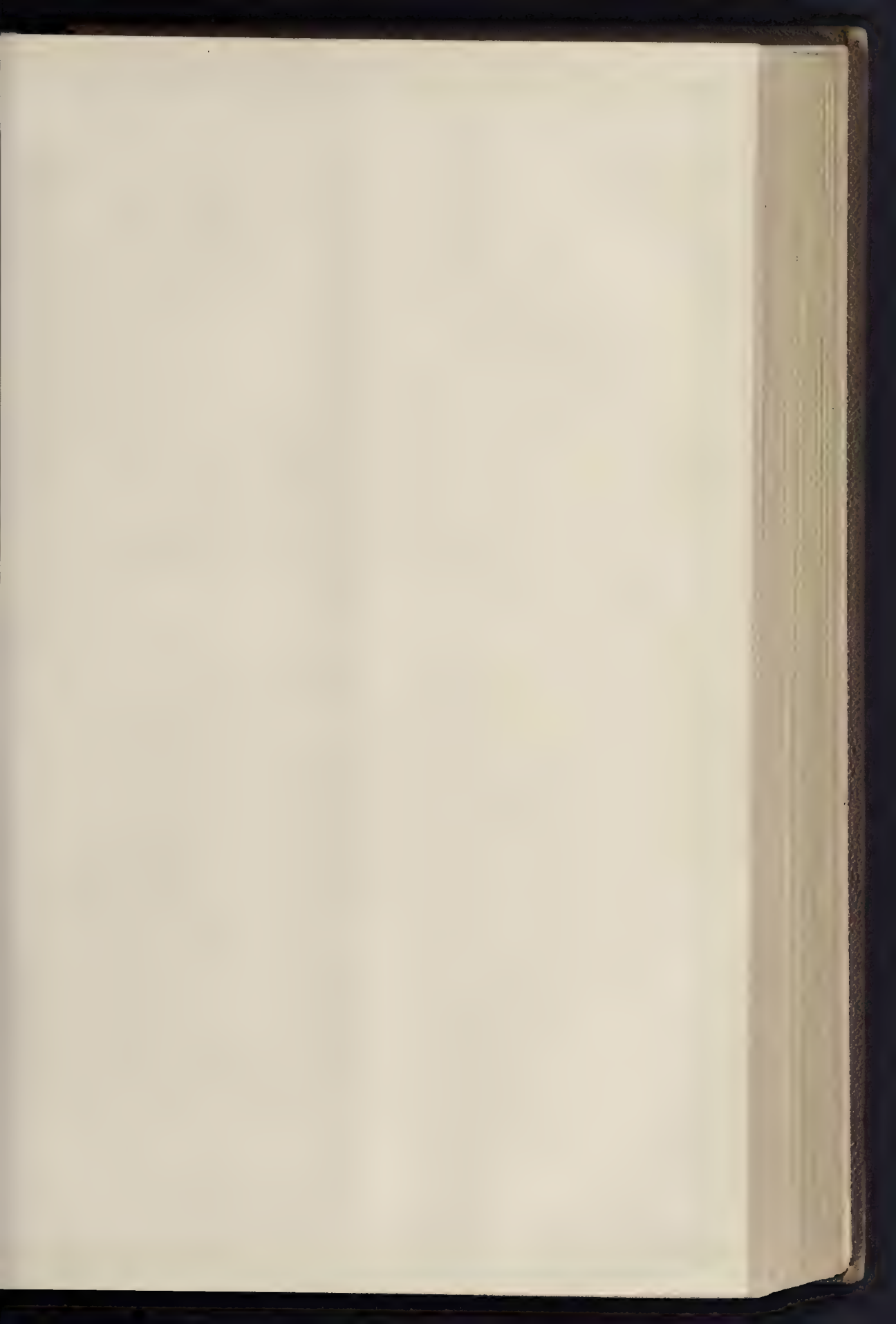
We illustrate the north wall of the aisle of Folkestone parish church, which has been recently extensively decorated with a series of pictures and other mural ornamentation. The pictures shown are the first three of the "Stations of the Cross." In size they vary from 5 ft. to 12 ft. in length, the height of each being 8 ft. They are executed on mahogany panels, and let into the wall, the chief object of this studio of the artist. The colouring of these pictures is exceedingly subdued in tone, giving more the effect of tapestry on the wall. The stained glass is also particularly quiet in colour, with almost a total absence of ruby and blue;



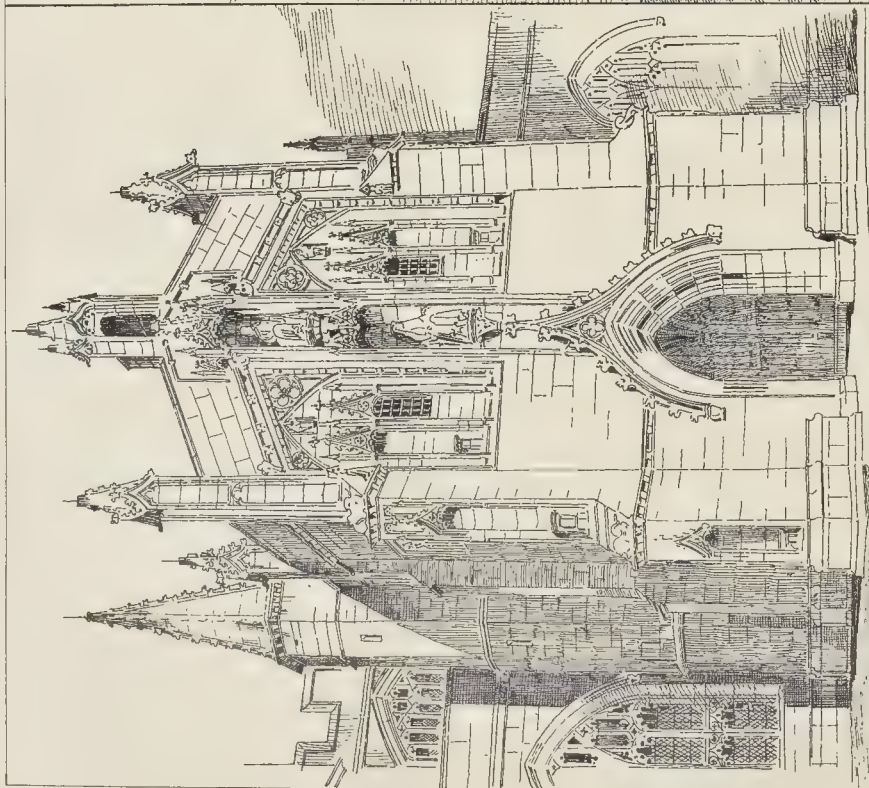






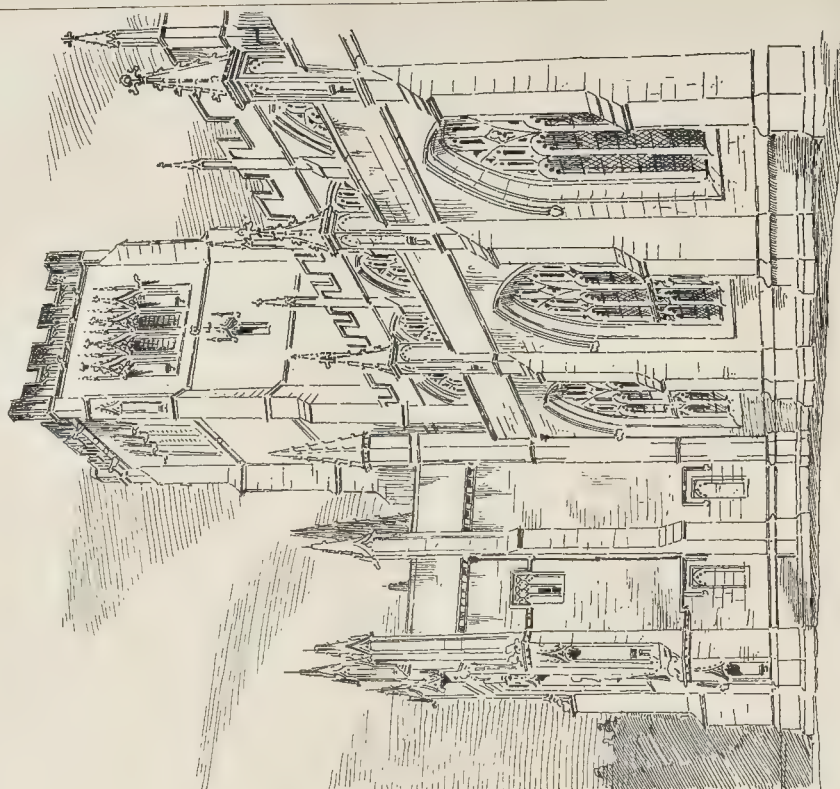


THE BUILDER, AUGUST 23, 1890.



The South Porch.

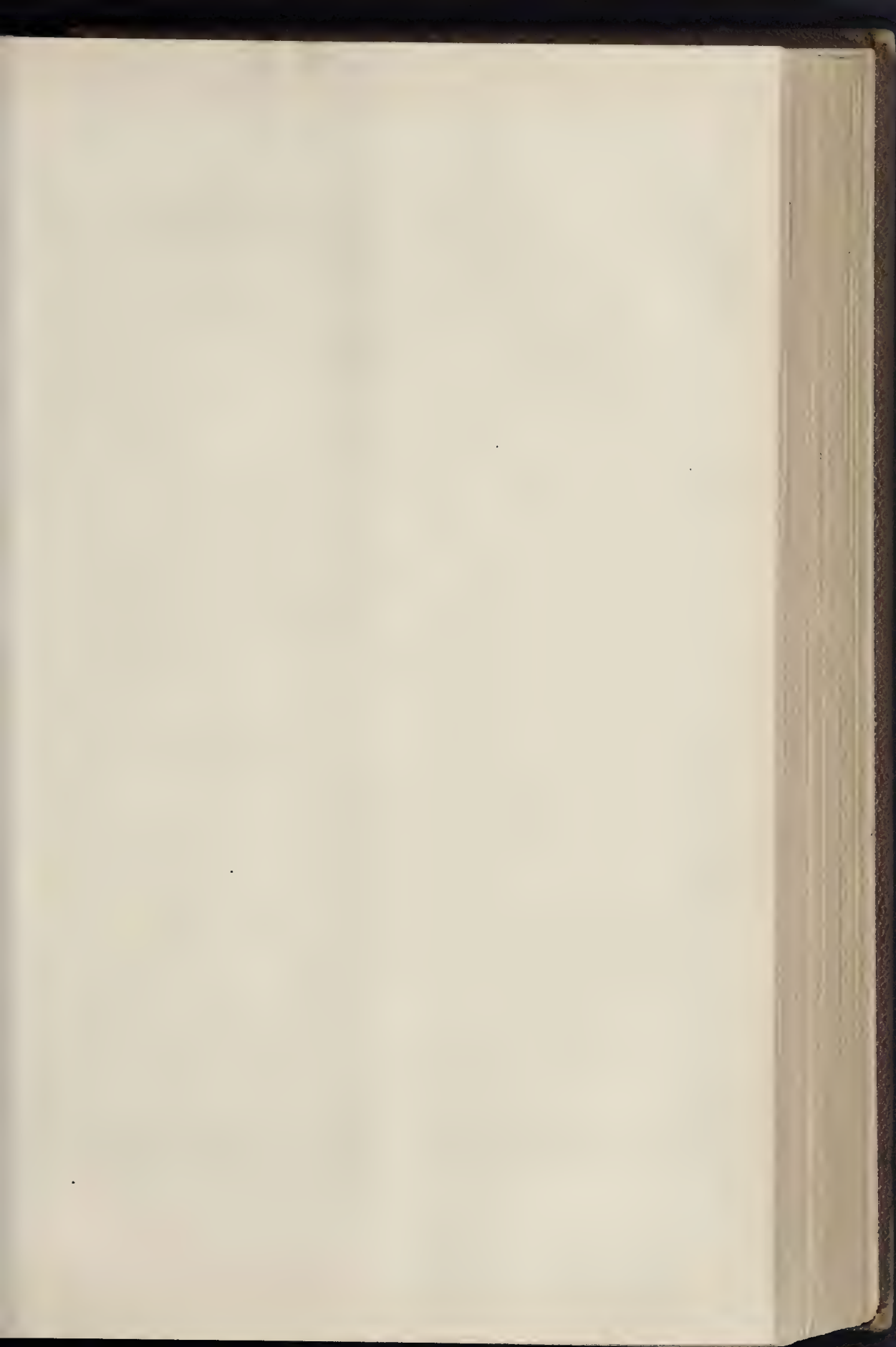
R.W.P.



South-East view of Church.

R.W.P.







THE PHOTOGRAPH BY J. C. MARTIN, LONDON.

"PERSEUS SLAYING THE GORGON."—M. MARQUESTE, SCULPTOR.

*Paris Salon, 1890.*



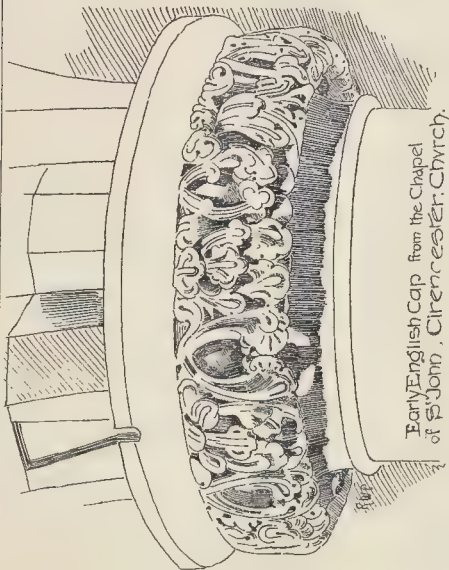
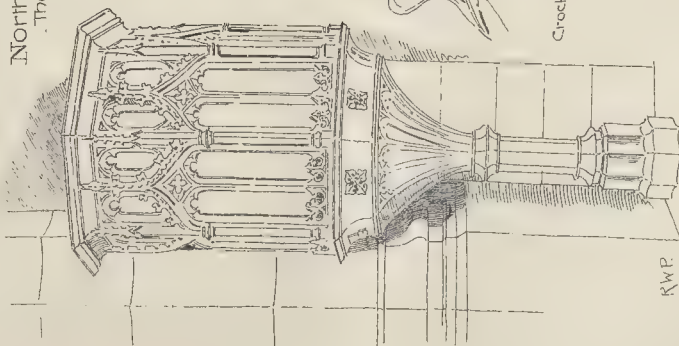


"THE FIRST-BORN."—M. HENRI L. LEVASSEUR, SCULPTOR.

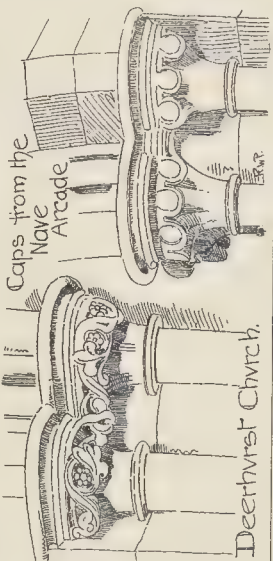
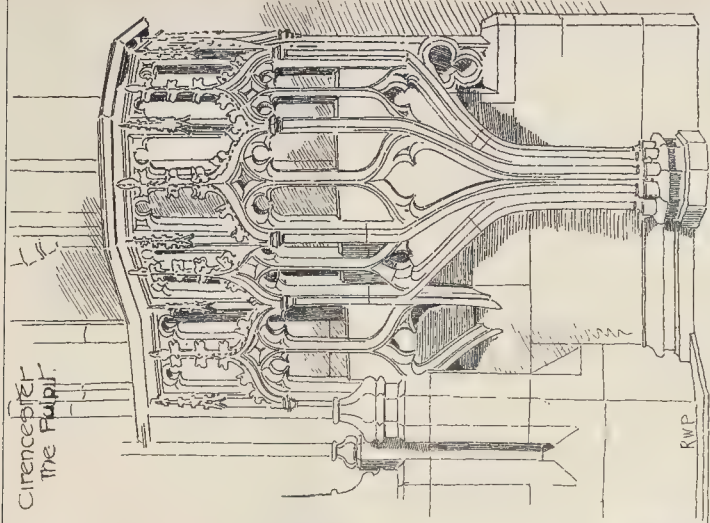




Northleach.  
The Pulpit.



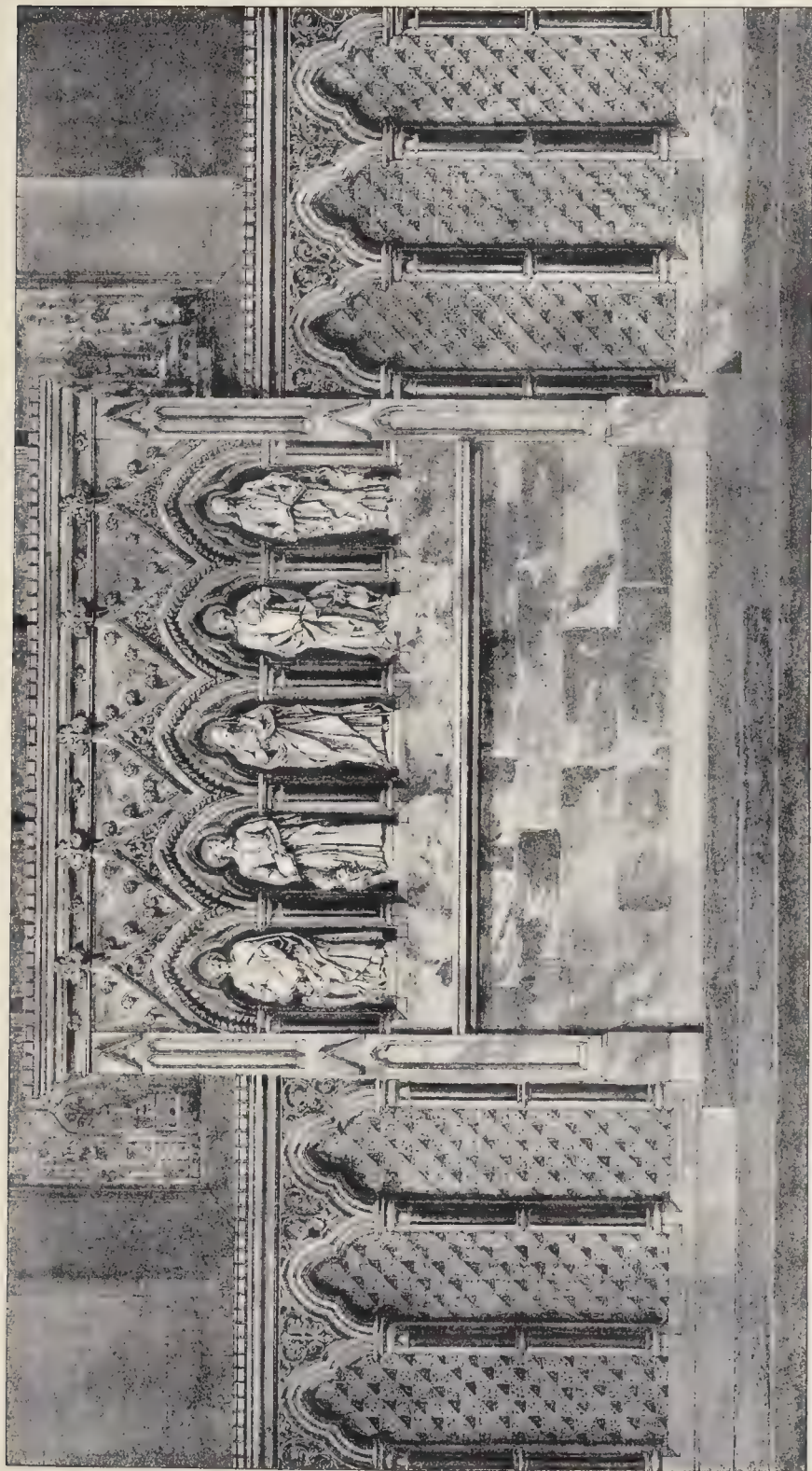
Cirencester.  
The Pulpit.



SKETCHES FROM CIRENCESTER, NORTHLEACH AND DEETHVRES.



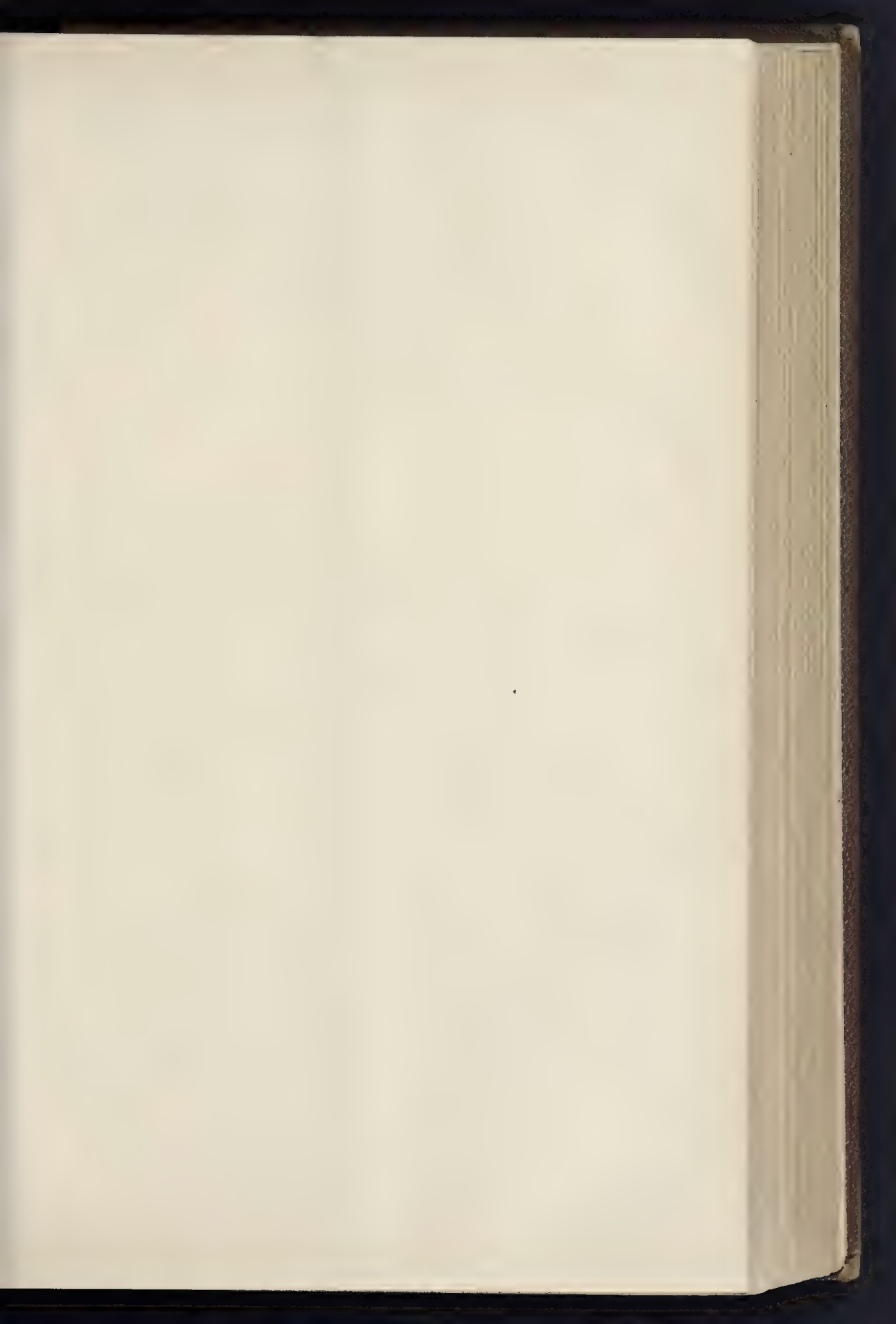




REBELIOS IN ST. MARY'S CHURCH, ABERAVON. MESSRS. KIMSON & LOWELL, ARCHITECTS.









PROPOSED NEW HYDROPATHIC

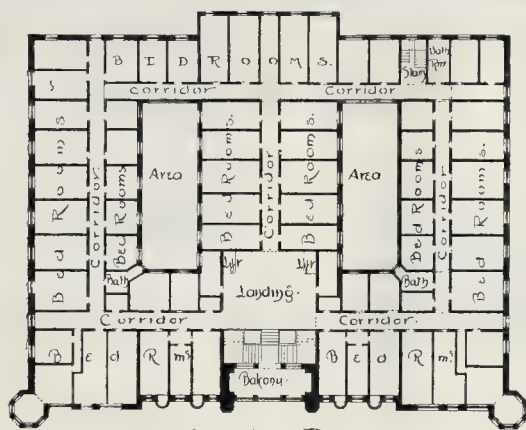




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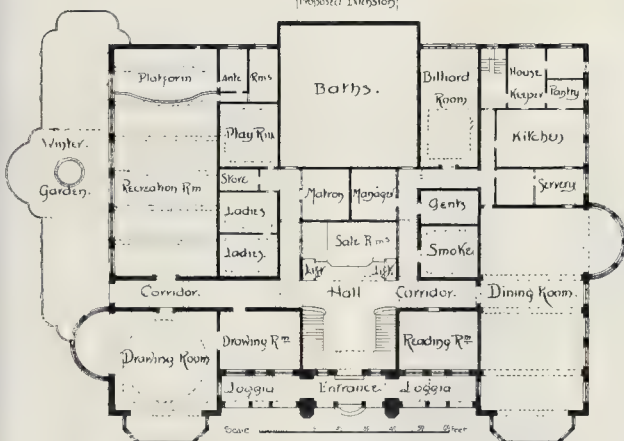






First Floor Plan.

(Proposed Extension)



Ground Plan.

Springbank Hydropathic Establishment, Harrogate.—Mr. R. Knill Freeman and Mr. S. Denison Robins, Architects.

the subjects represent five of the Archbishops of Canterbury, with scenes from their lives. The design for this work was exhibited in the late exhibition of the Royal Academy, and we noticed it in our issue of June 28 last. It is the work of Mr. Alfred O. Hemming, of Margaret-street, Cavendish-square, who is now, we understand, carrying out the remainder of his scheme on the south wall, and hopes to have all completed by the end of this year.

#### REDEROS, ST. MARY'S CHURCH, ABER-AVON.

THE new rederos in St. Mary's Church, Aberavon, is the gift of Mrs. Llewellyn, of Baglan Hall, and has just been formally dedicated. It is constructed of alabaster, with richly-coloured Irish green marble columns. It consists of an arcade of five arches, containing figures in white marble, of which the central one represents the Good Shepherd, while the other four are figures of the four Evangelists. All the arches or niches have mosaic backgrounds, and the whole is finished with a richly-moulded and carved cornice. The side arches are finely-moulded, and the panels are carved throughout. The marble and alabaster work was executed by Mr. Clarke, of Llandaff. The figures, by Mr. H. H. Armstead, R.A., were exhibited at the Royal Academy this year, and of one of them, that of St. John, we gave an illustration to a larger scale in our article on "Some Sculpture of the Year" in the *Builder* for May 31 last. Messrs. Kempson & Fowler, of Llandaff, designed the work. Our illustration is from a drawing exhibited at this year's exhibition of the Royal

Academy. The total cost of the work has been about 1,200*l*.

#### SPRINGBANK HYDROPATHIC ESTABLISHMENT, HARROGATE.

THIS new building will stand in the centre of a site of nine acres which has been acquired in the best position in Harrogate, adjoining the Spa grounds, with a frontage to the Ripon-road. It is close to the Montpellier Baths and Winter Gardens about to be erected by the Corporation at a cost of some 47,000*l*,\* and also near to the Sulphur Wells. The position and contour of the land render it peculiarly adapted to the purpose, and when laid out, the grounds, which are well wooded, will be very picturesque. The part near the building will be arranged as terraces falling towards the Spa grounds, the remainder being treated naturally, with a small lake in one part. Numerous tennis-courts are provided. This work has been entrusted to Mr. T. H. Mawson, Landscape Gardener, of Windermere. The building will be of stone, in the Renaissance style. It will contain about 200 bedrooms, a large Dining Saloon to seat about 350, large and small Drawing-rooms, Library, Reading, Smoking, and Billiard-rooms, &c. It will also have a large Winter Garden and Entertainment Hall, with retiring rooms, &c. The Turkish and other baths will be in the centre of the building at the back, and will be fitted up with the newest and most approved appliances. Lifts are so arranged that patients can be taken in wheeled chairs from their

\* We published elevations, plan, and sections of this building (Messrs. Baggeley & Bristowe, architects) in the *Builder* for August 2.

rooms, on either story, direct to the Turkish baths. The corridors are level throughout on each floor; they are wide and well lighted, and will form pleasant promenades. A number of the front bedrooms on the principal floors will be specially arranged as sitting and bedroom combined, on the Continental system. The lighting throughout will be by electricity.

Suitable gate-lodges and stables will be provided.

The cost of the building is approximately estimated at between 40,000*l*. and 50,000*l*.

The architects are Mr. R. Knill Freeman, F.R.I.B.A., of Manchester, and Mr. S. Denison Robins, of Newcastle.

#### THE ARCHITECTURAL ASSOCIATION EXCURSION.\*

ON the fourth day of the excursion (Thursday, August 14), the train was first taken to Witney, the concluding point of the previous day's work, and from there the party proceeded by the "Burford bus"—a change by no means for the better after the well-appointed four-horse coaches on which previous rides from Oxford had been made. Architecturally, this was decidedly the best day of the week, the head-quarters, of course, being *hors concours*. The weather, too, was fine, though dull and cold, a fortunate circumstance considering the state of the roads, the hilly route, and the limited capabilities of the Burford horses, which managed, with considerable effort, to take the party over five miles in fifty-five minutes. The first halt was made at Minster Lovell, where the hour and a quarter allowed were found all too short for the adequate study of the church (see illustrations in last week's *Builder*) and manor-house. The next stoppage was at Aethall, or, as the local sign-posts have it, "Aethally"—possibly a corruption of Aethall-leigh, the village being situated in a valley, which would justify the suffix. Thence progress was made to Burford, where the church (see illustrations in last week's *Builder*) and priory, to say nothing of the old houses in the town (some of which were illustrated by us last week), justified the allotment of the five hours and a quarter set down in the programme for the stay here, and disconcerted the intentions of some of the members to return to Oxford at an earlier hour in order to see the "Town" regatta and fireworks. The return was made by the "Burford bus" to Witney, whence train was again taken to Oxford.

The fifth day's outing (Friday, the 15th instant) commenced with a drive to Woodstock, in the teeth of the strong wind which has been so severely felt on the coast, and which the bicycling members found especially trying for the first part of the day. After waiting at Woodstock for the hour of eleven, at which his Grace of Marlborough opens his gates to the public, the party proceeded to view the famous palace of Blenheim, or at least so much of it as is shown to the ordinary everyday sightseer, a favour which hardly satisfied the dignity of members of the Architectural Association, especially as they, like other sightseers, were charged the sum of one shilling each by his Grace for the favour. These circumstances, perhaps, contributed in some degree to the openly-expressed disapproval of the work of Vanbrugh, who, in the opinion of the members, seemed to deserve all that has been said of him in the well-known epitaph, and more. The fine church of Kidlington (illustrated in last week's *Builder*) was next visited, together with the almshouses; and after luncheon the party proceeded to Water Eaton, which, by the strategy of the drivers, was reached after a mile's walk across the fields. The interesting manor-house (see illustration in last week's *Builder*) and church of Water Eaton quite restored the equanimity of the visitors, and obliterated the effects of the disappointment at Blenheim, so that all reached Oxford thoroughly prepared to enjoy the final dinner and the usual convivial evening afterwards, during which the scene of next year's excursion was discussed and the committee of management elected.

The last day (Saturday, the 16th), was, as is customary, somewhat broken, several members departing early. A small party, however, visited some of the more important colleges omitted on Monday, including Worcester, St. John's, Trinity, the Radcliffe Library, and the Sheldonian Theatre, and thus brought to a close the twenty-first excursion of the Architectural Association.

\* Concluded from p. 129, ante.



Fig. 1.



Fig. 2.



Fig. 3.

## OLD COTTAGES, GLOUCESTERSHIRE.—VI.

OWLPEN MANOR—HOUSE, illustrated on August 9 [p. 107, *ante*], is a most interesting old place, as the greater part of it remains, save for decay, in its original state. On a panel in front is a coat of arms, and elsewhere the date 1616 and the initials T.D., for Thomas Daunt, who was no doubt the builder of the house. Some of the windows retain the old fancy glazing, and as nothing seems to have been done to the house for about one hundred and fifty years, this is some proof of the comparatively modern nature of much of the square and diamond quarries that are familiar to us, since here the oldest glazing was replaced by diamond quarries after it had been in existence about one hundred years. There is much nice ironwork of a simple character remaining to the doors, and one room is panelled with oak, which has been distempered brown, and a rude sort of tree pattern painted on it in a darker shade. This is a probably original instance of what I mentioned in speaking of Surrey, that our ancestors, even before the introduction of the Dutch taste for paint, set little store by the beauty of the natural grain of wood. Another bedroom is hung with original "German waterwork" tapestry. In the offices is a sort of "hot-plate" of stone, containing round places which were filled with lighted charcoal, and fitted with vessels on the top. One wing was modernised about Queen Anne's time, and is all that is now inhabited. It is much to be hoped that while the house is preserved in its present condition as a most interesting genuine specimen, care will be taken that it does not fall into decay. There is an old-fashioned garden in front, with very large clipped yews which I have taken the liberty of showing more on one side than they exist. There is also a good flight of steps and gateway.

Painswick is a very clean and picturesque town, almost entirely built of the famous stone, which appears to be very weatherproof. The Court-house (fig. 1) is a large house adjoining the churchyard, and is so named from the fact that in 1643 King Charles I. held his court here at the time of the siege of Gloucester. He is supposed to have used the room with the bow-window, which was built on to the original house in 1640. The other side of the house is a very good specimen; but the ivy has been allowed to grow too thickly, and destroys its picturesqueness, and renders it "unsketchable." The hall was in the centre, with the entrance, and small gable over it, on one side. This part is dated 1604. The house is excellently cared for by its present owner, Mr. U. J. Davis.

Two other sketches at Painswick are of two separate pin mills, the first erected in this country. One (fig. 2) has a picturesque conjunction of large and small gables; the other (fig. 3) with the porch has the date 1678 on a shield (fig. 4) over the porch. The gables contain the chimneys, and the small windows on each side light the chimney-corners and cupboards.

In the porch is one of the oval windows generally found in the gables of the houses, and, therefore, generally inaccessible. I am able to give measurements of this and sketches (fig. 5) of several other varieties; other forms will be found in the views. The reveal of these internally seems generally to be square, and the openings had often only a shutter, but I have found in a house at Stroud, illustrated some time ago, one instance of original lead glazing.

The house at Stanbridge (fig. 6) I regard as a useful example of how absolutely little, beyond happy proportion, is required for successful effect. There is nothing here but a perfectly plain wall and roof, with grouped windows, and yet the result is more pleasing than many a more elaborate building. This also is probably quite accidental, as the parapet is certainly of later date than the windows, and I have no doubt there were originally a series of gables, as on other buildings of the period. There is another lesson here that has struck me forcibly in studying the buildings of this neighbourhood, and that is that, given certain formal shapes and details, it is important that they should not be displayed symmetrically. Thus, the mullioned windows are almost monotonous in form, and so are the gables. In the few instances in which these are all symmetrically arranged, there is a certain monotony of effect.



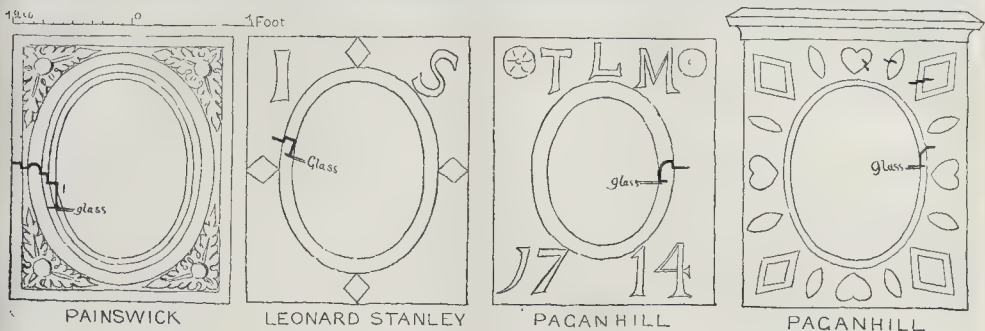


Fig. 5.



Fig. 6.

in spite of the first sight being somewhat imposing. In a number, however, there is a great variety and want of symmetry in the way the windows and other features are put together, and it is this happy combination to which they owe their picturesque appearance. A certain "stiffness" seems still to have been felt in many of them, and this was remedied at what seems to have been a later date by coatings of ornamental plaster over the main walling. Very few examples remain of this, but I shall speak of it later on.

Near Painswick is what is called "The Lodge," the remains of an important manor-house, containing some interesting Medieval fragments, and an inscription, but nothing for sketch.

RALPH NEVILL, F.S.A.

#### THE CAMBRIAN ARCHEOLOGICAL ASSOCIATION AT HOLYWELL.

The forty-fifth annual meeting of this Association was commenced at Holywell, in Flintshire, on Monday last, under the presidency of Lord Mostyn.

The first impression made by Holywell on the mind of the stranger is that the days of its greatest prosperity are gone by. The town is situated a mile and a half from the station, being reached by a road up the valley formed by the stream flowing from the far-famed well of St. Winefred, which gives the place its name and chief celebrity. One is rather startled to find a notice over an inn near the railway station to the effect that "St. Winefred's Fine Old Welsh Ales" may be drunk on the premises. No memory of the saint is generally suggestive of water, rather than ale, but the meaning of the notice is explained by the fact of there being a St. Winefred's brewery not far from the town. Just before entering the town a great mass of foliage is seen high above the road, and the left is St. Winefred's well, with the

picturesque old buildings which enshrine it. For the present we must be content with a passing glance, and hurry on to the "King's Head," a pleasant, old-fashioned hostelry, where the Association made their head-quarters.

The proceedings of the meeting were opened by the President's inaugural address, which was delivered in the Town Hall. It was a model of what such an address should be—not too long and not too dry. Lord Mostyn avoided the error, made by so many persons who have occupied a similar position, of treating his audience to a learned disquisition on archæology from the pre-historic period down to the present time. All his remarks were to the point. He touched lightly only on such subjects as were likely to interest those present, and treated everything with a characteristic lightness of touch. He commenced by pointing out that the portion of Flintshire to be explored during the week's excursions was the sacred ground of Welsh archæology, as being the birthplace of Thomas Pennant, the great topographical writer of the last century, and author of the "History of the parishes of Whitford and Holywell." Downing, the house where he lived, would be visited on the following Friday. He next referred to the date of the foundation of Basingwerk Abbey, and gave many curious particulars with regard to St. Winefred's Well, mentioning that within recent times quarter-sessions and assizes were held in the chapel above it. He said that Pennant gave the name of a foolhardy individual who used to risk breaking his neck by jumping off the wall of the church-yard into the well. The President spoke of James II.'s visit to Holywell, when he cured diseased persons by the laying-on of hands. He wondered also whether any of the gold rings, set with his hair, which the King had given away during his visit, were still in existence. Coming down to a later period, he observed that when George II. was proclaimed King in 1727, Holywell was described as the most pro-

sperous and populous town in Flintshire. He hoped that at no distant time its prosperity might be again renewed. The President, lastly, told his audience of the antiquities on his own property, amongst the most important of which were the great pre-Norman cross known as the Maen Achwynfan (or Stone of Lamentation) and the Roman Pharos, by which the ships were enabled to steer their course up the River Dee. Lord Mostyn concluded his admirable address by cordially inviting the Association to visit his house on Friday.

Archdeacon Thomas, in returning thanks to the President for his address, remarked that he thought a great opportunity had been missed when the last edition of Pennant's "Tours in Wales" was published. It had not been brought down to the present date in the same spirit that it had been begun. To execute this work in a more becoming manner, he thought, was a task that Lord Mostyn was eminently fitted to perform. He hoped they might live to see him undertake the editing of Pennant's "Tours." He also commented on the value of the "Chronicle of St. Werburg," as throwing light on the early history of Flintshire.

After the annual report of the Association had been read,

Mr. Henry Taylor, F.S.A., of Chester, was called upon to read his paper on "The First Charters Granted to the Four Senior Boroughs of Wales." The learned author traced the development of municipal institutions from the time of Edward I., showing the diplomatic policy adopted by this monarch in establishing merchants' guilds in the towns, which should act as a check upon the power of the feudal lords in the country. He said he believed Flint to be the birthplace of municipal institutions in Wales, and it was at this place that the first four Royal Welsh Charters were signed.

The paper was followed by a discussion, in which Messrs. Banks, Owen, and others took part, one question in dispute being whether the merchants' guilds were composed of Welshmen or Englishmen.

On Tuesday last the carriages started from the "King's Head" Hotel, at Holywell, at 9.30 a.m., taking the road towards Mold in a southeasterly direction along a hill-side. Had the day been finer, a good view would have been obtained across the estuary of the River Dee. As it was, only the nearer objects could be distinguished. The leading industry of the district appeared to be lead-mining, and vast heaps of limestone debris were to be seen in all directions.

The first stop was at Halkin, nearly four miles from Holywell. Here the Rector, the Rev. Walter Evans, acting in his capacity of Local Secretary for the meeting, pointed out the peculiarities of the church. The present structure was erected at the expense of the Duke of Westminster by Messrs. Douglas & Fordham, of Chester. It is built of yellow sandstone, with a good deal of polished marble within. The churchyard is entered under a well-designed timber lych-gate, and the modern carved woodwork inside the church deserves careful study. The whole of the present church is new, with the exception of a piece of sculpture, perhaps of the fourteenth-century, built into a buttress on the south side of the nave outside, at the east end. It was found by the Rev. Walter Evans in the belfry of the old church (built in 1769), used as a stone for the ringers to put their feet on. The sculpture possibly formed part of the churchyard cross. The subject represented is the Crucifixion, with



figures of St. Mary and St. John, each having the head inclined on one side, so as to look up at the Saviour. The folds of the drapery are as sharp as when first carved, assuming that the sculpture has not been tampered with by attempted restoration. Beneath is an angel, with a cross on the forehead, supporting the crucifix, which is placed under a small cusped canopy.

A mile and a quarter beyond Halkin the members left the carriages to walk up to the top of a hill, 993 ft. above the sea-level, called Moel-y-Gaer. The whole of the summit is enclosed within a single rampart of stones and earth, with a ditch on the outside. This hill fort is probably ancient British. It commands a fine view of the Moel Famman range of mountains, which were, however, on the present occasion unfortunately concealed from view by a dense black mist hanging over the whole valley.

Rejoining the carriages at the foot of the hill, a drive of two miles in an easterly direction brought the party to Northop Church. The most remarkable feature about the exterior is a massive Perpendicular tower, 98 ft. high, built in five stages, at the west end of the nave. The church has been recently restored and furnished with carved oak seating. The plan consists of a nave and chancel of the same width, with a north aisle continued along the whole length of both, and separated by an arcade of six pointed arches, springing from octagonal pillars. The old Perpendicular roof of low pitch still remains. The portion over the chancel has been decorated with painting. At equal distances along the north wall of the north aisle are four effigies placed in arched recesses in the wall, three being those of knights in plate armour, and one that of a lady under a canopy. The inscription on the effigies of one of the knights is in late Lombardic capitals, as follows:—

HIC : IACET : ICH : VACH : AP :  
BLED : VACH.

[Here lies Ithel Vychan ap Bledd-Vach].

The effigy of the lady is inscribed in almost identical characters:—

DIE : MAI : ANNO : DNI :  
M : CCCCLXXII.

I . . day of May in the year of our Lord 1472.]

On the edge of this effigy was another inscription, but it has all been chipped away except the letters V C V. Pennant conjectured from this that it might have been the tomb of Leucl Llwyd, who died in 1482.

From Northop the party proceeded to Mold, two miles to the south, where after luncheon and a short rest the parish church was inspected. The plan consists of a nave with north and south aisles, separated from it by an arcade of seven Tudor arches, having a western tower built in 1770, and an apical chancel of octagonal shape, not more than fifty years old. The effect of seeing the three windows of the apse through the wide chancel arch from the west end of the nave is not by any means unpleasing. The nave and aisles are Late Perpendicular in style. The arcades are very richly decorated with sculpture. Above each pier is an angel holding a shield bearing a coat of arms; in the spandrels are other similar shields, but smaller, and a frieze of beasts runs the whole length of the church above the points of the arches. The devices on the shields are partly religious, consisting of the emblems of the Passion, and partly heraldic. Amongst the latter were to be seen the curious representation of the eagle carrying the swathed body of an infant in its claws, which was adopted as a coat-of-arms by the Stanley family. The clear-story windows are square, and very small. There are several fragments of old stained glass in the windows of the north aisle. One small piece bears the date 1500. Over the north door of the north aisle was remarked a beautiful painted glass window, with two coats-of-arms and inscriptions beneath; the one on the left being the royal arms of Henry VII., with a request to pray for the soul of David ap Res, a previous vicar of Mold; and the other, on the right, the Derby arms, with a request to pray for the soul of Edward, Earl of Derby, who died in 1572. A frieze of beasts runs round the whole of the church outside, as well as inside. The porch has a stone roof.

Leaving Mold the members drove on to Pentre Hobin, a mile and a half to the south-east, the residence of Mr. Pennant A. Lloyd. The house is built of yellow sandstone, and is an interesting example of old Welsh domestic

architecture, with mullioned windows and oak-panelled rooms. The date on the doorway is 1540, and that over the curious carved oak chimney-piece in the dining-room, 1546. Adjoining the house is a series of eight vaulted cells, erected by an ancestor of the present owner in order to afford accommodation to the travellers, after the dissolution of the monasteries, when the monks could no longer entertain strangers. The cells average 5 ft. by 7 ft. by 6 ft. high, and each has a small entrance doorway, and an aperture for ventilation at the side of it. The cells are all covered by one roof. At one end is a building containing a room for the superintendent, which is reached by a short flight of steps.

After Pentre Hobin the next place visited was the Tower, half a mile to the south-west, a Medieval fortified house where in 1465 Reinalt ap Gryffydd ap Bleddyn killed Robert Bryne, the Mayor of Chester, after a faction fight at Mold fair. The stanchion in the tower-arched ceiling of the lower room of the Tower, now used as a dining-room, is traditionally believed to have been made use of to hang the Mayor, but it was more probably intended for the suspension of a chandelier. The present owner, Mr. Howard, has modernised the building, but without destroying any of the ancient features.

On the return journey to Holywell the party again passed through Mold, getting just a glimpse of the once strongly-fortified mound called the Bailey Hill. The last stop was at Gwasaney, two miles north-west of Mold, the residence of Mr. Philip E. Davies Cooke, who entertained the members to tea, and also read a paper on Euloe Castle. Mr. Davies Cooke exhibited some of his Welsh MSS. He is the fortunate possessor of the original MS. of the "Liber Landavensis," but it could not be seen on this occasion, as it is being copied at Oxford.

A drive of over seven miles brought the party back to Holywell.

We will next week continue our account of the proceedings.

## Books.

*Public Libraries: a History of the Movement and a Manual for the Organisation and Management of Rate-Supported Libraries.* By THOMAS GREENWOOD, F.R.G.S. Third Edition. London: Simpkin, Marshall, & Co. 1890.

THIS admirable and comprehensive manual, now in its third edition, has been entirely rewritten. It extends to nearly 600 pages, and its carefulness and completeness are such as to render it a reliable source of information to all who are interested in the provision of public libraries. As the author points out, the feeling in favour of the adoption of the Public Libraries Acts has been rapidly growing during the last few years. Four years ago, when the first edition of this work was published, only 133 places had adopted the Acts. But up to June 25 last, while the third edition of the book was in the press, 209 places had adopted the Acts, 21 of this number being metropolitan parishes. Seventy-six adoptions of the Acts in four years, against 133 for the previous thirty-six years, may certainly be considered a very satisfactory record, and it is one which has afforded great delight to Mr. Greenwood, who is an enthusiastic upholder of the Free Libraries movement, about which he is thoroughly well informed, and writes *con amore*. He advocates the discontinuance of the word "Free" as applied to rate-supported Public Libraries. He says: "The use of the word 'free' attached to these libraries rather stamps them as being of the nature of charitable institutions. In no sense are they so. The more accurate as well as the more dignified designation is that of Public Libraries." In his introductory chapter the author gives a history of the Public Library movement since the first Public Libraries Act was carried by the late Mr. William Ewart, M.P., in 1850. The text of this and of the amending Acts are given in the book, which contains no fewer than thirty-four chapters and four appendices. Every conceivable question arising in connexion with the adoption of the Public Libraries Acts is treated of in some detail. For example, there is a chapter showing "how to bring about the adoption of the Acts," and there are several chapters as to the special objects to be aimed at in the administration of libraries in London, in provincial cities and towns, and in villages. The ways in which public libraries can be made to facilitate technical education, and to supplement lectures and work in science and art classes, &c., are enlarged upon in two chapters, while several other chapters are devoted to the description (illustrated with small views and plans) of public libraries at home and abroad. The names of the architects of these buildings, we regret to notice, are not always given, and there are one or two slips in the architectural descriptions: for instance, the block on p. 236 is a cross section, not an "elevation," of the new Edinburgh Public Library. Nevertheless, the book is well worthy of the attention of architects. There is likely to be an increased demand for Public Library buildings within the next few years, and, as Mr. E. W. Mountford pointed out in his paper read before the Architectural Association in February last (see *Builder* for February 15, 1890, p. 116) a well-arranged Public Library plan can only result from a clear comprehension of the essential points to be attained, viz., plenty of storage room for books; sufficient light, room, and comfort for readers; and facility of superintendence and management. Mr. Greenwood's book, especially when read in conjunction with Mr. Mountford's paper, makes these points clear, but we are in some doubt as to endorsing the views put forward by both gentlemen to the effect that lavatory accommodation and sanitary conveniences for readers within the buildings should be of "a very limited character, if provided at all." There are special difficulties attending this question, mainly arising out of the necessity which exists for economy of administration; but each case ought to be carefully considered with a view to combine efficiency with economy.

*Heating by Hot Water.* A Reprint of Papers from the *Ironmonger*. By WALTER JONES. (London: Crosby Lockwood & Son. 1890.)

THIS small book, although having but little more than a hundred pages, can be read with considerable profit by all seeking information in this direction, as it is the work of a practical engineer, and it deals with the subject very soundly and as comprehensively as the limited space permits.

It must, however, be pointed out that of the eighteen chapters that the book contains, all but three are devoted to the low-pressure system. It must be admitted that this system is of far wider application, and in more general favour for almost every purpose, than either the high or medium pressure system; and as the author is the manufacturer of appliances for low-pressure work, we may infer that a preference for this branch of the subject is naturally arrived at.

Briefly, the book consists of a chapter upon the high-pressure method, and some information upon heating water for bath supply; the remaining pages dealing with the low-pressure system, advantages, cause of circulation, varied methods of application, laws governing water and heat, causes of failure, boilers and boiler setting, chimneys, fuel and stoking, pipes and joints, water-supply, radiating media and appliances; and interspersed are a variety of useful tables and calculations, which, however, are chiefly taken from existing standard works. The book should be of use as an elementary treatise.

THE TECHNICAL INSTRUCTION ACT, 1889.—We are officially informed that the Lords of the Committee of Council on Education have received a letter from Mr. J. J. Bickerton, Town Clerk of Oxford, dated August 6, 1890, stating that the Town Council of that city propose to make grants under the powers conferred upon them by the Technical Instruction Act, 1889, to the School of Science and Art in Oxford for the promotion of technical instruction; that at that institution instruction is given in the following subjects which are not included in the branches of science and art with respect to which grants are at present made by the Department of Science and Art, viz.: Wood-crafting, with lessons in design; Drawing to scale as applied to practical work; Manual training in the use of tools for working wood and iron; and that the circumstances of the district require facilities for instruction in these subjects. In accordance with the request of the Town Council, their lordships have sanctioned the Technical Instruction Act, 1889. Under like circumstances, their lordships have sanctioned instruction in plumbers' work for the borough of Rochdale.



# The Student's Column.

## HOT-WATER SUPPLY.—VIII.

THE TANK SYSTEM: *continued.*

THE last paper completed the description of this apparatus so far as the hot-water pipes are concerned, and it only remains to speak of the pipe or service which brings the cold water to the tank as fast as any of the hot is withdrawn.

The "cold supply," as this pipe is called, is brought from any low point in the cold-water system, and from there it is carried to and into the apparatus. There are many different opinions as to where this service should be connected, some recommending that it be taken into the return pipe near the tank, others that it be taken into various places in the tank, and advocates can be met with for taking this pipe down to the boiler. What has to be considered wholly and solely is that the inflowing cold water must not materially affect the temperature of the hot water, neither must it be possible to have cold water issuing from the hot taps before all the hot water is withdrawn. It is not necessary to go into particulars just now, but it may be taken for granted that the best place to bring in the cold supply is at the bottom of the tank, as far removed from the return and flow-pipes as possible. The reason for this will be clearly understood presently.

It will have been noticed in fig. 13 (page 112, *note*) that the "cold supply" service-pipe is carried down with a dip before entering the tank. This dip in the pipe is called the "syphon" not by any means a correct term, as it is not allied upon to answer the purpose of a true syphon, nor could it do so in this inverted form, and it answers the purpose of preventing hot water finding its way up the cold supply into the cold-water cistern, which it would quickly do if this pipe were carried straight from cistern to tank. This dip or "syphon" is usually about 10 to 12 in. deep, and its purpose is fulfilled by the fact that hot water, being of less specific gravity than cold, cannot descend and overcome the superior weight of the latter, and it will be understood, by referring to an earlier paper, that when hot and cold water are set in motion by their different degrees of gravity, the hot water has no power to descend until it has lost its heat.

This pipe is usually  $\frac{3}{4}$  in. or 1 in. diameter all water-pipes are measured internally), depending upon whether the apparatus is a small or a large one, and it should always be provided with a stop-cock, so that when needed the apparatus may be emptied without drawing off all the cold water in the house, or without plugging the cold-water cistern. This stop-cock should have two special features, the first being that it should have a loose key, as it

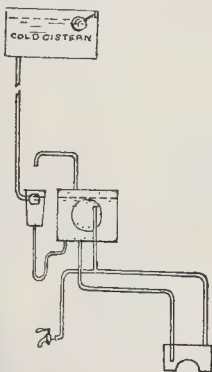


FIG. 16.

THE CYLINDER SYSTEM.

could never be interfered with except by those who understand its use (this tap should also have a distinctive label, as there are often several stop-cocks in a house), and the cock should particularly have a "full way,"—i.e., a cock should have a 1-in. clear way through as an impediment of any description in the

cold supply will materially interfere with the full flow of water from any and every part of the apparatus, and it will be seen clearly that it is useless having a 1-in. service-pipe if the stop-tap has only a 1-in. way through it.

It used to be the regular thing to fit up a small supply cistern with a ball valve at the side of the tank; but few could ever explain why it was used, and as in the majority of instances it was not only useless but an actual drawback in impeding the free inflow of cold water, it soon fell into disuse, and cannot often be met with now. An instance where this arrangement is a desirable one is when the cold cistern is situated at the top of the house (as usual) and hot water is only required on the ground-floor, in which case, to save carrying the expansion pipe to the top of the building a supply cistern may be fitted as fig. 16.

This more modern and much improved apparatus is supposed to be of American origin, and the chief feature in it, as can be judged by its name, is the cylinder which acts as the hot water reservoir, and it is necessary to explain first why a cylindrical reservoir is used with this system, instead of the more familiar rectangular tank.

This apparatus, which is illustrated at fig. 17,

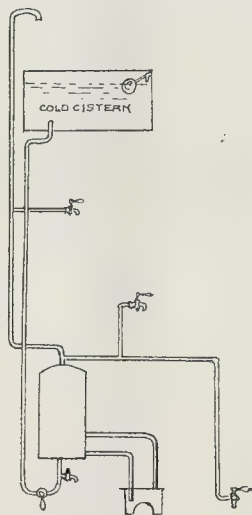


FIG. 17.

has the reservoir in quite a different position to that in the tank system, and the prevailing idea to be followed, and which is one of the chief advantages gained in erecting this apparatus, is to have the reservoir as little above the level of the boiler as possible, so that all the draw-off services can be taken from above it, which is exactly contrary to the plan adopted in the last system explained.

The reason that a cylinder is used in place of a tank is simply that the former is capable of bearing a much higher pressure of water than the latter; and as a cylinder has quite commonly to withstand an internal strain of 25 lbs. to the square inch, a tank would be totally unsuited, as the strongest of these latter, made of, say,  $\frac{3}{8}$  in. plate, are not guaranteed by the makers to withstand such a pressure as this; but a cylinder of  $\frac{3}{8}$  in. plate is always supposed to be tested to 25 lbs. before it leaves the manufacturer's works; and a tank or cylinder can always be worked up to the maker's tested pressures.

Tanks are and can be used in place of cylinders sometimes when the pressure is light, but unless it is very light indeed some trouble is nearly sure to ensue, especially if the tank does not come from a good maker, as in making tanks it is supposed and intended that they shall not be fixed more than a very few feet below the cold water level under any circumstances. Of course, what leads people to use tanks if they have a reasonable excuse for so doing is the desire to economise, as they cost so much less than cylinders; for instance, one of our

best maker's lists prices a 40-gallon tank,  $\frac{3}{8}$ -in. plate quality, at 22. 11s., whereas a 40-gallon cylinder,  $\frac{3}{8}$ -in. plate quality, is priced at 3l. 6s. The practical difference, however, is not so very great, as it must be borne in mind that there is a very considerable variation in the pressures they will bear, and it is fairer to compare them in this respect than to difference assumes quite another aspect; for instance, a 40-gallon tank tested to 10 lbs. per square in. ( $\frac{3}{8}$ -in. plate) is priced 4l. 1s., and a 40-gallon cylinder, tested to 15 lbs. ( $\frac{1}{4}$  gauge), is 2l. 14s. only.

To locate the position of the cylinder first, it is most usual to put this in one of the recesses that are nearly always to be found on either side of the kitchen chimney-breast, or, if it is impossible to place it here, it can be fixed up in another room, but it must be noted that the proper place for it is as close to the boiler as it can be got, in as warm a position as possible, and the bottom of the cylinder to be between, say, 12 in. and 30 in. above the top of the boiler.

Between the boiler and the cylinder is carried a flow and return service, as illustrated, and on precisely the same principle explained in the tank system, although much shorter; but it should be explained here that cylinders are never sent out with manlids at the side unless expressly ordered, as they have removable tops,

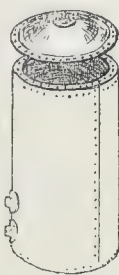


FIG. 18.

as shown in fig. 18; but without a side manlid it is very awkward to reach the pipe connexions inside at the bottom, if it is desired to do so. Some makers will put a side manlid to the medium and better quality cylinders, free of charge (in which case the top is a fixture), and this is much the most convenient arrangement, but it is necessary to specify this when ordering. It is also most necessary to have flanges put on in the required positions, as illustrated, as it is a poor job to connect the pipes without them. There is no extra charge for these, and there should be one for each flow and return pipe, one centrally on top, for the expansion (or rising main, as it is more often called in this system), and one centrally in the bottom for cold supply.

## GENERAL BUILDING NEWS.

NATIONAL MUSEUM AND LIBRARY, DUBLIN.—The new Museum of Science and Art and the National Library of Ireland, forming the new block of buildings in Kildare-street, will be formally opened to the public by the Lord Lieutenant on Friday next, the 29th inst. The architects are Messrs. T. N. and T. M. Deane.

A NEW CHURCH FOR FLEUR-DE-LIS, MONMOUTHSHIRE.—The *Western Mail* says that to meet the growing requirements of this district, the trustees of the Gelligaer Lectureship Charity have decided to erect a church, for which they have selected the designs submitted in competition by Mr. E. A. Johnson, of Abergavenny and Newport.

A NEW PUBLIC HALL FOR SOUTH SHIELDS.—The *Newcastle Chronicle* says that a large assembly hall, with suitable apartments connected with it, which, it is stated, will be one of the largest halls in the North of England, is about to be built by Mr. F. M. Laing, at South Shields. Messrs. Middlemies Bros., Corbridge and Newcastle, are stated to be the contractors.

CHAPEL AT ST. JOSEPH'S HOME, HARTLEY, NEAR PLYMOUTH.—The Right Rev. Dr. Vaughan, Roman Catholic Bishop of Plymouth, recently laid the foundation-stone of a private chapel at St. Joseph's Home, Hartley, near Plymouth, in connexion with the Little Sisters of the Poor. The cost will be about 2,000l. Mr. F. Tasker is the architect, the contractor being Mr. P. Blower.



**NEW CHURCH AT CRAWSHAWBOOTH.**—The erection of a new church at Crawshawbooth, near Rawtenstall, has been commenced, from the designs of Messrs. Paley & Austin, architects, Lancaster. Mr. Thomas Brooks, J.P., generously has given the site for the church, besides subscribing 3,000l. towards the cost of erection. Tenders amounting to 6,839l. 14s. have been let.

**NEW WESLEYAN CHAPEL AT LITTLEBECK, NEAR WHITBY.**—The memorial-stones of a new Wesleyan chapel have been laid here. The building will be built of stone by Mr. J. Hutchinson, of Skipton, from designs by Mr. Wm. Watson, of Lythe.

**NEW SYNAGOGUE AT NOTTINGHAM.**—A new Jewish synagogue and schoolhouse in Chaucer-street, Nottingham, have lately been opened. The architect was Mr. W. H. Radford, of Nottingham, and the builder Mr. J. Osecroft, the contractors for the marble-work Messrs. Lewis & Grundy. Including the cost of the site, the expenditure has been about 3,000l.

**RAILWAY EXTENSIONS AT SOUTHPORT.**—In consequence of a rapidly-increasing traffic, the Lancashire and Yorkshire Railway Company are making extensive additions to and alterations at the Chapel-street station, Southport, and have other improvements in contemplation. The chief addition at present is the erection of a new engine-shed and other works in connexion with a cost of some 14,000l. The plans have been prepared by Mr. Hunt, the Company's engineer, and will be carried out, under the supervision of Mr. Bowen, by Messrs. Robert Neill & Sons, contractors, Manchester.

**NEW BRASS FOUNDRY AT WALKER, NORTHUMBERLAND.**—A large building for Messrs. John Mills & Sons, brass-founders, of Newcastle, has been erected close to Walker, Gate Station. The removal of Messrs. Mills & Sons' foundry from Forth-street has been rendered necessary by the comprehensive scheme of railway improvements now being carried on by the North-Eastern Company, which has entailed the demolition of a vast amount of old property, and has brought about the migration of more than one old and well-known business concern. According to the *Newcastle Chronicle*, the proprietors instructed the architect to provide them with a building of some architectural character, and they are stated to have been successful in getting it. The whole of the works have been designed and carried out by Mr. W. H. Knowles, architect, Newcastle, Mr. Walter Scott being the contractor.

**THE PARISH CHURCH OF MOUNTNESSING, ESSEX.** has been re-opened, after partial re-building under the direction of Messrs. Bodley & Garner, architects. According to the *Essex Chronicle*, the walls and arcades have been rebuilt, and a new oak roof, boarded and plain-tiled, provided. The tower, which was in a dilapidated condition, has been fully restored, English oak being used, as in all other work executed. The chancel has likewise been repaired, and the whole of the church re-seated. The material of the old building has been utilised as far as possible, so that the columns appear in their old form. The font was once in Eulton Church, and the pedestal is made of stone from the old font of Mountnessing. The cost of the restoration amounts to 2,000l. The builder was Mr. J. Cross. The church is stated to be two miles from the village.

**SHELTER, BRASSEY RECREATION GROUNDS, MIDDLETON (LANCS).**—On Saturday last a new shelter was opened in the Brassey Recreation Grounds at Middleton. It contains compartments for boys and girls and is well fitted with seats. It is built in the Old English style with local bricks and Ruabon stock-dressings, the roof being covered with red tiles. The design was selected in an open competition, the author being Mr. T. A. Fitton, architect, of Middleton, who has superintended its erection. Messrs. Parlington, of Middleton, were the builders.

**PRIMITIVE METHODIST CHURCH, EXMOUTH.** Extensive alterations and additions have been made to the Primitive Methodist Church, Exmouth, Devon. The chapel and school-room have been lengthened by about 30 ft., a new gallery erected with front of horseshoe shape (made by McFarland & Co., of Glasgow), an open colonnade built in front of the church, and five new class-rooms, and ministers' vestries, &c., added in the rear. The church has been re-seated throughout and a new rostrum provided, this and the seats being in pitch pine. Messrs. Kerley & Ellis, of Exmouth, were the architects, and Messrs. Cooper & Son the builders.

**SCHOOLS AT BABBY, NEAR THIRSK.**—The schools here, which are at present small and dilapidated, are to be pulled down, and new ones, with master's house, &c., to be erected. Messrs. W. Lewis & Son, architects, York, have been instructed to prepare plans.

**GREENWICH UNION INFIRMARY.**—We understand that Messrs. T. Potter & Sons, Limited, of Oxford-street, have just supplied and fixed at the Greenwich Union Infirmary, two of their large hydraulic lifts; also sixteen of their central double "thermo-hydric" stoves, hot and cold water supply for baths and lavatories, and drying closets in laundry. The two sets of iron fire-escape staircases and balconies have also been carried out by them.

## SANITARY AND ENGINEERING NEWS.

**SANITARY CONGRESS AND EXHIBITION AT BRIGHTON.**—On Monday next, the twelfth Autumn Congress and Exhibition, under the auspices of the Sanitary Institute, will be opened at Brighton. We have received a copy of the preliminary programme. Sir Thomas Crawford, K.C.B., M.D., will be the President of the Congress, which will, as usual, be divided into three main sections, viz.—Section I., Sanitary Science and Preventive Medicine, presided over by Dr. G. V. Poore; Section II., Engineering and Architecture, presided over by Professor T. Roger Smith, F.R.I.B.A.; and Section III., Chemistry, Meteorology, and Geology, presided over by Mr. William Topley, F.R.S., F.G.S. In connexion with the Congress there will be a series of lectures by Dr. Arthur Newsholme and Inspectors of Nuisances. There will also be a Health Exhibition, which will be held in the Corn Exchange, the Pavilion-buildings, and Museum. On Monday, at 1 p.m., the Mayor will receive the members of the Congress in the Pavilion-buildings. Luncheon will follow, and at 3 p.m. the Mayor will open the Exhibition. The first general meeting of the Congress will be held at 8 p.m., when the President of the Congress, Sir Thomas Crawford, will deliver the opening address. On Tuesday, Section I., Sanitary Science and Preventive Medicine, will meet. At 10 p.m. the President of the Section, Dr. Poore, will deliver an address. The time from 11 a.m. to 1 p.m., and from 2 to 5 p.m., will be devoted to the reading and discussion of papers, which will be continued on the following day. At 8 p.m. on Tuesday there will be a *conversazione* in the Pavilion-buildings. On Wednesday, at 10.30 a.m., Section II., Engineering and Architecture, will meet. At 10 p.m. the President of the Section, Professor T. Roger Smith, has delivered his address, the morning and afternoon will be occupied by the reading and discussion of papers, which will be continued on the following day. On Thursday at 11 a.m. there will be a Conference of Medical Officers of Health; and at 5 p.m. there will be a "Lecture to the Congress" by Dr. W. H. Trevelyan, F.R.S. On Friday, Section III., Chemistry, Meteorology, and Geology, will meet at 10.30 a.m., when the President of the Section, Mr. W. Topley, F.R.S., will deliver his address. The Section will devote the remainder of the morning and afternoon until 4 p.m. to the reading and discussion of papers. At 11 a.m. on the same day there will be a Conference of Inspectors of Nuisances. At 5 p.m. the closing general meeting of the Congress will be held. Saturday will be mainly given up to excursions, but in the evening, at 8 o'clock, Dr. Richardson, F.R.S., will deliver an "Address to the Working Classes."

**THE ASSOCIATION OF PUBLIC SANITARY INSPECTORS OF GREAT BRITAIN** will hold their annual Summer Meeting at Yarmouth this Saturday, the 23rd inst., Dr. Richardson, the new President, presiding, supported by Sir Robert Rawlinson, Dr. Alfred Carpenter, and other gentlemen. Dr. John Batley, Medical Officer of Health, will deliver an address entitled "Historical Notes on Sanitation in Great Yarmouth." Afterwards the party will visit the waterworks and drainage system.

**BISHOPSTON WATER-SUPPLY.**—A Local Government Board inquiry has been held by Mr. R. J. Smith at Luton School, Bishopstoke, respecting an application from the Rural Sanitary Authority to borrow 350l. for works of water-supply. The hamlet of Luton, which comprises about 100 houses, is at present supplied by four wells, which are occasionally dry during the summer months. The proposed works will give an ample supply to all the cottages. It is proposed to utilise a spring in a field at Higher Brake, situated on land belonging to Lord Clifford. His lordship has granted the use of the water free and given the site for the reservoir, which will contain 8,000 gallons, on condition that the farm on which the land is situated is supplied gratuitously. The spring yields a supply of 3,000 gallons per day, as tested last summer.

**CROMER WATER SUPPLY.**—An unforeseen accident to the machinery at the Cromer Water-works a few days ago rendered it necessary to obtain a temporary supply. This was accomplished by laying nearly half a mile of iron pipes. The iron pipes were procured from a distance, laid with caulked and leaded joints, all connexions made, the water turned on, and a full supply to the town (which is crowded with visitors) again established in the short space of forty-eight hours. This is expeditious work.

**FALKIRK AND LARBERT WATER-SUPPLY.**—The new works for providing a much-needed additional water-supply for Falkirk, Larkhall, and district have lately been completed. The population to be supplied, allowing for a probable increase during the next ten years, numbers 30,000, while allowance has also been made for a probable demand for water for manufacturing purposes. By the present scheme the district will be supplied from the Faughlin Burn, a tributary of the Carron, situated about eleven miles from Falkirk. Mr. W. R. Copland was the engineer, and Messrs. D. Y. Stewart & Co., of Glasgow, were the sole contractors. The total cost of the scheme has been about 70,000l.

**THE EDUCATION AND REGISTRATION OF PLUMBERS.**—The following resolution was passed by the Public Health Section of the British Medical Association at Birmingham a few days since:—"That the Public Health Section of the Meeting of the British Medical Association in Birmingham approves of the system of education, examination, and registration of Plumbers, and of the formation of a Committee and local centre for the purpose, and expresses its hope that the memorial addressed to the Plumbers' Company will be approved and acted on in the interests of public health." The resolution was moved by Dr. Alfred Hill, Medical Officer of Health, Birmingham, seconded by Dr. J. B. Welch, Handsworth, and supported by Dr. Ernest Hart, London.

## STAINED GLASS AND DECORATION.

**NEW WINDOWS IN WICKERLEY CHURCH.**—During last month the side windows in the chancel of Wickerley Church, near Rotherham, have been filled with stained glass. The one opposite the altar represents St. Cecilia, and the two within the sacristy depict angels in the act of praise and adoration, below being the words "We Praise Thee, O Lord," and "We acknowledge Thee to be the Lord." The inscription below the window on the north side is as follows:—"In the vault beneath this window were interred on Easter Eve, 1839, the remains of Amelia Yates, of Wickerley Hall." The inscription of the opposite window is—"In loving memory of Thomas Cavill, dedicated by his widow, Sarah Cavill, and his daughter, Fanny Woodhouse, 1890." The windows are the work of Mr. Barnett, of Leth, and have been fixed by Mr. W. B. Watson, of Rotherham.

**WINDOWS, STAFFORD-ON-AVON PARISH CHURCH.**—The chancel of this church, writes the Vicar, the Rev. Geo. Arbuthnot, has just been enriched by the gift of two windows from the studio of Messrs. Lavers & Westlake. They have been erected at a cost of 500l., in accordance with the will of the late Miss Bromley, and represent the Seven Acts of Mercy, illustrated from female lives in the Old Testament, and eight Beatitudes, from the same in the New Testament.

**WINDOW, WOLBOROUGH CHURCH, NEWTON ABBOT, DEVON.**—This old South Devon church has just received the addition of another stained-glass window. It occupies a place in the south aisle, near the porch, and is erected by Lady Rae, in memory of Sir William Rae, K.C.B., who died in April, 1875, at the age of eighty-six years. The subject is the Resurrection of the Good Samaritan. Not the least interesting feature in this work (according to the *Western Morning News*) is the preservation of the fragments of ancient stained glass scattered throughout the old glazing. These have now been placed by Mr. Fredk. Drake, of Exeter, the artist, chosen to design and execute this window, in the tracery of the window. These fragments consist of the heads of a bishop, an abbot, a priest, and a layman, but the greatest interest centres in the two panes of ancient glass placed in the two middle tracery openings. They are small, but beautifully painted, and represent a female saint behind prison bars. The hand passing through the subject of the scene of benediction. Below, but outside, is shown a male head. The second piece of glass is painted to represent the hand and arm of a woman pulling down an idol of most hideous appearance, which stands upon an altar, holding a kind of billhook in its claws, and is broken off short in the middle of the back. The saint represented behind prison bars breaking idols is said to be St. Christina.

## FOREIGN AND COLONIAL.

**FRANCE.**—There is to be a competition opened for designs for salt baths at Dax; the building is to cost 300,000 francs. The authors of the three best designs will receive premiums of 4,000, 1,500, and 500 francs. The railway station at Saintes (Lower Charente) having proved inadequate for the traffic, is to be rebuilt, at a cost of 280,000 francs. The town of Meaux is about to erect a memorial statue to General Bessier, killed during the Franco-German war. M. Aubé, the author of the Gambetta monument, is to be the sculptor. At Conflans-St. Honorine, in the department Seine-et-Oise, a Merovingian burial-ground has been discovered, containing 285 sepulchres. M. Alphonse de Rothschild has presented to the Museum of Natural History a fine work by the recently deceased painter Lapostolle, representing a view of Rouen, which figured in the Salon of this year. All French architects and engineers are invited to take part in the competition for designs for the building for the National and Colonial Exhibition to be opened at Lyons in 1892. The competition will be closed September 30. M. Albert Lefeuve has just completed the model for the statue to be erected at Livry to Vice-Admiral Jacob, who defended Rochefort against the Allies, and died in 1854. The pedestal will be designed by M. Reboul. The jury for the competition for a set of school buildings at St. Denis have awarded the first prize to



MM. Vaurabourg and Boisset, the second to MM. Latour and Théodore Debit, and the third to MM. Guyon and St. Maurice.—The Municipality of Lyons intends to institute an annual competition for decorative landscape painting, for the prize founded by a late artist of Lyons, M. Ponthus Cinier.—There have been discovered at Montmartre, in an old half-ruined pavilion of the eighteenth century, four fine bas-reliefs, representing Apollo and Daphne; Latona; Apollo and the Sybil; and Apollo and Corvus. These bas-reliefs, discovered by M. Joseph Blanc, the painter, are attributed to Bouchardon, the sculptor of the fountain of the Rue de Grenelle.—The Church of Notre Dame of Quelen, one of the remarkable monuments of Brittany, has been partially destroyed by a fire.—At Paris, near the Pont Louis Philippe, an iron siphon has just been placed to convey the drainage of the Ile-St.-Louis, which formerly went direct into the Seine, to the intercepting sewer on the right bank, and a similar siphon will be formed near the Pont Neuf to convey the sewage of the Ile de la Cité also to the intercepting sewer, which discharges at Asnières.

At the clasp as well as in the official Central-Blatt der Bauverwaltung, the Kyffhäuser Monument to the Emperor William I. will be carried out in accordance with the design and under the superintendence of Bruno Schmitz, the first prizeman at the competition. We hear that a special competition is, however, to be opened to sculptors only for the equestrian statue and the other sculptural portions of the design.

SWEDEN.—The new extension of the Royal Record Office buildings at Stockholm is now nearing its completion. Behind a façade of red brick with stone facings, we find the apparently very practically planned sets of storage rooms; the different stories being connected with one another by means of a main staircase of large proportions, and an interesting combination of stone and iron work, and by several internal staircases placed in convenient positions. The building is constructed fireproof throughout, wood, however, being used for the partitions in the iron frame document-stands. The use of a composite stone instead of freestone, both in the exterior walls as in the main staircase, is a great disadvantage to the attainment of effect; the dull blue grey of the artificial stone being out of place on an otherwise so monumental building, the depth of the walls of which and the mass of iron used in which being well worthy of note. The internal arrangements and the fittings are simple in the extreme. The design of the elevation harmonises with the function the building is about to fulfil.—The Cathedral of Linköping has been under repair and restoration, which has been carried rather too far in the direction of cleaning-down, destroying the ancient character of the building.

The Cathedral at Lund is undergoing extensive restoration, the exterior work being now complete; but there is a great deal to be done yet in the interior, to which a scheme of coloured decoration is ultimately to be applied. A large new church at Lund is also nearly completed, remarkable for the size of its galleries and the superfluous amount of lighting, which will not assist the effect of the interior.—At Götterberg and Motala large new churches are also being erected, which are not so remarkable for their intrinsic architectural beauties as for the picturesque sites which they occupy, that at Motala especially standing on a plot of land just above the splendid Trollhällen waterfall.

THE CORINTH CANAL.—A new company, the Sociéte Hellenique, has been formed to carry out the work on the Corinth Canal, which has now been in abeyance for many months. The capital is five million francs. The work will now be at once proceeded with.

AUSTRIA.—An amphitheatre larger than the one at Verona has been come during the recent excavations on the ground where the old Caracallum of the Romans formerly stood (on the Danube between Altenburg and Petronell). According to a contemporary the wall surrounding the arena proper is still in good condition. The diameters of the elliptical arena measure about 72 and 44 metres respectively; the amphitheatre must have held, according to the calculations of Bauarth Hauser (who has the superintendence of the excavations) some 8,000 spectators.

# MISCELLANEOUS.

A NEW PARK FOR WALLASEY.—The Wallasey Local Board have received a letter from the Local Government Board sanctioning the borrowing of £7,500, by the Local Board for the purchase of Liscard Hall and grounds, to be formed into a public pleasure-ground, and also the borrowing of £1,600, for the purpose of carrying out the necessary works in connexion therewith.

THE STALLS IN STRATFORD-ON-AVON CHURCH.—The Rev. George Arbuthnot, the Vicar, writes to the Times to say that the work of restoring the old stalls, under the direction of Messrs. Bodley & Garner, is almost complete. Under the stalls sufficient of the ancient reredos has been found to lead Mr. Garner to think he can make a drawing of what it was when the church was built.

PROPOSED STREET IMPROVEMENT AT FARNWORTH.—Mr. Arnold Taylor, on behalf of the Local Government Board, recently held an inquiry into the subject matter of an application by the Farnworth Local Board for power to borrow £2,500, for works of private street improvement. The Surveyor (Mr. W. J. Lomax) explained the nature of the work which the Board intended carrying out with the money. Rawson-street and Bridge-street were to be paved, flagged, channelled, kerbed, and sewered where necessary; and Stenshill (north and south), Back Buckley-lane, Back Albert Head, and Back Harrowby-street were to be sewered.

THE PROPOSED BIRMINGHAM AND LIVERPOOL SHIP CANAL.—At the recent International Congress on Inland Navigation, held at Manchester, Mr. S. Lloyd read a paper on the proposed Birmingham and Liverpool Ship Canal, and described the steps which had been taken with a view to carrying out the undertaking. The writer, finding that it was not likely that the London and North-Western Company would make a new canal between Mid-England and the Mersey, and having had a long acquaintance with the late Mr. Daniel Adamson, wrote to him when the Manchester Ship Canal was initiated to point out the desirability of a steam barge canal from the Manchester Ship Canal to North and South Staffordshire and Birmingham. Mr. Adamson stated his opinion that without a good waterway to the sea such an inland district could not continue to hold its own, much less make progress. While the subject was still under consideration, Mr. Beriah Shepherd, early in 1888, made an entirely independent examination of a canal route from Wolverhampton, via the Potteries, to Winsford on the Weaver, and reported that after careful personal examination he found that there would be no engineering difficulties, and an ample supply of water. The intended route of the canal, proposed by Mr. Shepherd was surveyed and approved by Messrs. Brunles, of Westminster. The canal would be 72 ft. wide at the top and 52 ft. at the bottom, with 11 ft. depth of water. The hydraulic lifts were designed to take 400-ton barges. The sides of the canal would be concreted to a depth of 9 ft., which would effectually render the action of the wash of water, and it was considered by the engineers to be a matter of certainty that concreted of the thickness and depth shown would maintain the sides intact so perfectly that the item for maintenance would be almost nil. The canal would be puddled from end to end, to ensure each section being perfectly watertight, and the difference of level would be overcome by hydraulic lifts instead of by water locks. The engineers, Messrs. Brunles, had given attention, with Mr. Shepherd, to the water supply, and were satisfied that it would be abundant. They stated that the cost of making the canal 6 miles in length would not exceed £200,000; but this was the exclusive of the land, and it would require about £1,200 acres.

SCOTCH PROPERTIES FOR SALE.—At Edinburgh (1) on October 8, the Penicuik estate, in Midlothian and Peebleshire, at foot of the Pentlands Hills, consisting of 10,627 acres, of which nearly 4,800 are arable, 4,288 moor and pasture, and 1,274 woodland. The free rental, exclusive of the shooting and house amounts to about 8,000. The minerals and feu and tack duties yielding £7,000 a year. The mansion, built, after the Classic style, in 1761, stands in a park of 800 acres, watered by the North Esk. It contains some fresco ceiling paintings, in illustration of Ossian's poems, executed by Reinman for Sir James Clerk, Bart. Here Allan Ramsay was a frequent visitor. The house erected in the grounds an obelisk to his memory; and here has been preserved the coat worn by Dundee at Killiecrankie. In the immediate neighbourhood are the historic sites of Ravenscraig, Logan House, and Brunstane Castle, together with Newhall and Habbie's How, commonly identified with the scenery of "the Gentle Shepherd." It is stated that the estate is rich in ironstone, coal, &c., and capable of considerable development in that respect. (2) On October 22, the Stobs estates, in Roxburghshire, consisting of Stobs (10,000 acres), in the valley of the Stirling (a tributary of the Teviot), near Hawick, with Stobs Castle, net rental 4,770; Hailston (2,900 acres), in the Rait valley, near Jedburgh, and stretching from that river to the top of Ruberslaw—net rental, 1,848; and Lymiecleuch, at the head of the river Teviot—about 16,500 acres, yielding a net rental of 1,450. These will be first put up in one lot, at an upset price of 195,000; 4, and, if not so bought, then in three lots, at the several upset prices of 120,000, 50,000, and 25,000.

STUART'S GRANOLITHIC PAVING.—The Directors of Stuart's Granolithic Paving Co., Limited, have declared an interim dividend of 5 per cent., being at the rate of 10 per cent. per annum. This is exclusive of their foreign business.

THE ENGLISH IRON TRADES.—There is still a strong and upward tendency in the English iron market, and the outlook is more encouraging in most departments of the trade. The demand for pig-iron is fairly active, but it is not full enough to warrant the rise in prices which has taken place, and which must be attributed rather to speculative influences. Scotch warrants are about 1s. higher on the week, and up to 1s. 6d. more per ton is quoted for Scotch makers' iron. Middlesbrough

iron has gained 1s. 6d. a ton in value, warrants being about 9d. higher than the price for No. 3, which is 46s. There has been considerable business done in Lancashire pig-iron by merchants, who are evidently buying for a further rise on present advanced rates. In Staffordshire and the Midlands generally, higher prices are stiffly quoted. Manufactured iron, under a better enquiry, has advanced about 5s. per ton in the North of England and Scotland, but is unchanged at present in Staffordshire and Lancashire. In the steel trade, although the demand is not over-active, better terms are quoted and obtained by makers, who refuse to sell at the old prices. There is a slight revival in the ship-building trade, more orders having been placed this week. Engineers report themselves somewhat slack as regards fresh work, but continue fairly well employed.—Iron.

PAVING IN SOUTHWARK.—The Brunswick Rock Asphalt Paving Company inform us that they have just completed the paving of the footway of one side of the Borough High-street, and are now paving the south-west side of the footway of Southwark Bridge-road, for the vestry of St. George the Martyr.

THE STRIKE OF JOINERS AT EXETER has terminated, with the result that, after having been out some three months, the men go in again on much the same terms as before.

## LEGAL.

### DAMAGES FOR BREACH OF CONTRACT AGAINST A SHEFFIELD BUILDER.

WOOD v. BRUMBY.

This was a case tried at Leeds Assizes a few days since, before Mr. Justice Wills and a special jury. The defendant was Henry Brumby, builder and contractor, of Sheffield, was sued by Mr. George Baruch Wood, mechanical engineer, and his wife, Mrs. Mary Helen Wood, for damages for breach of contract, and also for alleged fraudulent misrepresentation upon the sale of a house in Machon Bank-road.

Mr. Charles F. Wilks, civil engineer, and Borough Surveyor to the Corporation of Sheffield, said he was invited the property in question on February 21 last, and in consequence of reports he received from inspectors, he wrote to the defendant complaining of the unsatisfactory manner in which the drains had been laid, but he received no reply to that complaint. Witness refused to give a certificate that the house was fit for habitation, and ordered the plaintiff to uncover all the drains for inspection. They were subsequently relaid in accordance with the requirements.

The defendant, in his evidence, said he bought in 1887 the land on which the house in question was erected, in partnership with Mr. Edwd. Holmes, a surveyor. Mr. Holmes prepared the plan for the houses. There were originally three, but this was subsequently altered to two. Mr. Holmes generally superintended the building of the houses. From time to time witness personally inspected the works. The drains were properly laid, the very best material was used, and they were joined with clay. The floor on the basement floor he considered to be outside, and he treated it as such. It opened into a building which might be used as a tool-shed. The drains were ventilated by seven or eight tall pipes, which went up the side of the house and projected over the eaves. The drains were left open for about a week after they were completed in order that they might be inspected. The usual notice was sent for the inspection of the drains. He was subsequently informed by two of his men that Inspector Kelly had been, inspected the drains, and told the men to cover them over. As far as witness was aware there was nothing contrary to the then existing regulations. He thought the drainage was efficient in every way, and he told Mr. Wood so. After the plaintiff entered into possession of the house no complaint was made about the drainage for a long time. Complaint was made by the latter that he had let him and his wife go into the house without first getting the certificate. To that witness replied that he got a certificate for the caretaker, and he thought that was sufficient.

Ultimately, Mr. Tindal Atkinson, counsel for the plaintiff, said that, after consulting with the other side, an agreement had been come to whereby judgment would be entered for the plaintiffs for 1000, and costs. He could assure his Lordship and the jury that he had great pleasure also in withdrawing the charge of personal fraud made against the defendant. There was not the slightest doubt that the drainage was not what it should have been, but he thought he was in a position to be able to say that perhaps the defendant did not represent that which he absolutely knew was untrue, but he did that which was very often done, he said that which he believed was true and which had been told to him. On behalf of his client, therefore, he was willing to believe that far from making a false statement which he actually knew was false, the defendant represented that which he honestly believed was the fact.

Mr. Barker, one of the counsel for the defendant, said that on behalf of his client he was much obliged to his learned friend for the handsome



manner in which he had withdrawn the charges of personal fraud. As far as Mr. Brumby was concerned this was the most serious item in connection with the action. He felt that he ought to make some compensation to Mr. Wood, because it had clearly been demonstrated that there were some serious deficiencies, and, though he denied any warranty, yet he thought he was really morally bound to make good the defects which he had represented to the plaintiff to be right.

His Lordship congratulated the jury on the action ending in so satisfactory a manner, and judgment was entered for the amount agreed upon.

## MEETINGS.

**SATURDAY, AUGUST 23.**  
*Association of Public Sanitary Inspectors*—Annual Summer Meeting, to be held at Great Yarmouth. An address will be delivered by Dr. John Batley entitled "Historical Notes on Sanitation in Great Yarmouth." *Glasgow Architectural Association*—Visit to Linlithgow Palace and St. Michael's Church.  
*Edinburgh Architectural Association*—Special Excursion with the Glasgow Architectural Association to Linlithgow.

**WEDNESDAY, AUGUST 27.**  
*Somersetshire Archaeological Society*—Annual Meeting, Castle Cary.

**THURSDAY, AUGUST 28.**  
*Somersetshire Archaeological Society*—Annual Meeting (continued).

**FRIDAY, AUGUST 29.**  
*Somersetshire Archaeological Society*—Annual Meeting (concluded).

**SATURDAY, AUGUST 30.**  
*Liverpool Engineers' Society*—Visit to the Liverpool Overhead Railway.

## RECENT PATENTS:

## ABSTRACTS OF SPECIFICATIONS.

**12,655.**—HEATING BUILDINGS: *J. Watson*—According to this invention the boiler is enclosed within two cases on three sides, one being outside, the other kept about 1 in. apart by perforated metal strips. This forms a hot-air chamber from which the heated air passes into the building, while the water contained in the boiler heated by means of the gas flows through the usual hot-water heating-pipes, warming one or more rooms by hot air, and other rooms, conservatories, greenhouses, &c., by hot water. The boiler may be heated by gas, arranged according to a previous patent.

**13,036.**—KILNS FOR ENAMELLED BRICKS: *A. Taylor*—This invention consists of a series of pieces of fire-clay slabs with vertical or horizontal wings and recesses at their corners, the end of the wing resting on the recess of the next, the recesses and wings being for the purposes of receiving the articles to be fired, and to prevent the breakage and waste experienced by the ordinary method.

**13,259.**—WINDOW SASHES: *A. D. Trengrove*—Instead of using weights, the method adopted in this invention is that of controlling and operating window-sashes by means of cog-wheels, and racks and pinions.

**7,802.**—MISCELLANEOUS: *G. Hayes*—According to this invention, the lathing of sheet metal is corrugated throughout, having apertures formed at intervals by cutting slots or slots in the sheet, and turning pieces back so as to form hooks or bars which grasp and firmly fix the plaster.

**8,571.**—SASH FASTENERS: *C. Dean*—The form of fastener which is the subject of this patent fastens and secures the meeting-rails by a combined sliding and oscillating bar with a hooked end engaging in a shoulder catch on one of the rails. Arrangements for locking the fastener are also included in the specification.

**9,030.**—SASH FASTENINGS: *C. Shovel*—According to this invention sash and casement fastenings are stamped from sheet-metal in as few pieces as can conveniently be used.

**10,050.**—WATER-CLOSET BASINS: *W. B. Drayson*—The end of the trap of this closet basin is made somewhat different from forms in general use, so that it may be better fixed to the closet-pan, and the trap is so placed as to intervene between the closet and the soil-pipe and prevent the sewer-gas from rising.

## NEW APPLICATIONS FOR PATENTS.

**Aug. 5.**—12,200, E. Bally & E. Wehrli, Farquary, 12,215, H. Davis, Metal, Varnish, and Paint Brush Preserver.—12,219, J. & I. Hillwell, Mantel-pieces.  
**Aug. 6.**—12,278, C. Fulton, Chimney Cornices, &c.—12,301, W. Clark, Syphon Water Valve-preventer.  
**12,304, W. & W. Bradford, Axle Sash Pulleys**—12,307, W. & W. Bradford, Axle Sash Pulleys.  
**Aug. 7.**—12,379, H. Mott & J. Perry, Decorative Wall Papers.  
**Aug. 8.**—12,402, J. Vickers and others, Bakers' Ovens.—12,410, A. Rockwell, Door-bell Mechanism.—12,423, H. Kelsey, Casement Fasteners.—12,431, J. Palmer, Material for Covering Walls, Ceilings, Floors, &c.  
**Aug. 9.**—12,430, G. Gardner, Sash Pulleys.—12,474, J. Martin, Pumps.—12,478, S. Bromhead, India-rubber Flexible Roofing, &c.—12,498, J. Bayly, Securing Stove-pipes in Walls.—12,508, F. Prescott, Flushing Apparatus.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

**6,183, F. & A. Widmer, Valveless Syphon Water-waste Preventer or Flushing Cistern**—8,519, O. Prinz, Cement.—10,283, W. Thwaites, Preventing Down-draughts and allowing Easy Outlet for Smoke from Chimneys, &c.—10,773, J. Gittings, Bolts for Sliding Doors, &c.—11,144, J. Merrill, Latrines or Water-closets.—11,181, W. Nunn, Flushing Water-closets, &c.—11,493, G. Houghton, Sliding Intakes for Siphon Pipes.—12,541, C. Muller, Stoves.—11,602, G. Bischoff, White-Lead.—11,748, G. Howe, Production of Bar-Relief Ornamentation in Plastic Material.

## COMPLETE SPECIFICATIONS ACCEPTED.

## Open to Opposition for Two Months.

**12,932, J. Emmens and J. Hewitt, Brackets for Cistern Pulls**—15,713, W. Halliwell, Ventilating Roofs of Railway Stations, Greenhouses, &c.—15,854, H. Dixon, Veneering.—1,356, A. Boulton, Rough Glazed and Coloured Facing Stones.—4,608, C. Longley, Wood-Block Flooring.

## SOME RECENT SALES OF PROPERTY:

## ESTATE EXCHANGE REPORT.

**AUGUST 11.**—By *G. Gouldsmith, Son, & Co.*: "Kent House," New-rd., Richmond, u.t. 34 yrs., gr. 354, 1,900.—By *Debenham, Tesson, & Co.* (at Folkestone): a plot of freehold land, Alexandra-gardens, Folkestone, 1404, 1, 3, and 5, Alexandra-gardens, f. 1202, 3, 754, 7, 9, 24, 26, 27, and 29, Alexandra-gardens, f. 2, 5707, 12, 14, and 20, Alexandra-gardens, f. 1,3504, f.g.r. of 74, with reversion in 92 yrs., Oxford-ter, 1754.

**AUGUST 12.**—By *Debenham, Tesson, & Co.*: The f. residence, "Nutcombe," and acres, Hainhead, Surrey, 1,2004; the f. house, "Friars' Hatch" and grounds, Walthamstow, 5504; 55, King George's-st., Greenwich, f. r. 104, 2704.—By *Purvis & Aldridge*: F. cottage and plot of land at Rye-green, Carshalton, 2504.—By *F. Jolly & Co.*: 2 to 8 (even), Lynton-rd., Leytonstone, u.t. 79 yrs., gr. 144, 5904; 25, Lynton-rd., u.t. 70 yrs., gr. 37, r. 161. 18s. 1704.—By *Rutley, Son, & Vine*: 33, Brookly-st. and 4, Barnaby-mews, Islington, u.t. 18 yrs., gr. 104, r. 521. 10s. 3054; 19, 21, and 23, Pancras-rd., Tottenham-Ct., u.t. 14 yrs., gr. 151, 3604; 25, Craven-pk., Wiltshire, u.t. 28 yrs., gr. 104, r. 521. 10s. 5404; 23, Burton-cres., Euston-rd., u.t. 16 yrs., gr. 312. 10s. 2804.—By *Willatts & Charlton*: 78 plots of f. land, Epsom Downs, 1,334, 1,335, 1,336, 1,337, 1,338, 1,339, 1,340, 1,341, 1,342, 1,343, 1,344, 1,345, 1,346, 1,347, 1,348, 1,349, 1,350, 1,351, 1,352, 1,353, 1,354, 1,355, 1,356, 1,357, 1,358, 1,359, 1,360, 1,361, 1,362, 1,363, 1,364, 1,365, 1,366, 1,367, 1,368, 1,369, 1,370, 1,371, 1,372, 1,373, 1,374, 1,375, 1,376, 1,377, 1,378, 1,379, 1,380, 1,381, 1,382, 1,383, 1,384, 1,385, 1,386, 1,387, 1,388, 1,389, 1,390, 1,391, 1,392, 1,393, 1,394, 1,395, 1,396, 1,397, 1,398, 1,399, 1,400, 1,401, 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CONTRACTS.—Continued.





# The Builder.

VOL. LIX. No. 2422.

SATURDAY, APR. 30, 1890.

## ILLUSTRATIONS.

The Public Fountains of Paris:—  
The Fontaine de Mars, the Fontaine des Innocents, and the Fontaine de l'Echaudé ..... Double-Page Ink-Photo.  
The Fontaine de Grenelle ..... Single-Page Ink-Photo.  
The Fontaine de la Paix ..... Single-Page Ink-Photo.  
The Proportions of The Parthenon: Diagrams in Illustration of Mr. Watkins Lloyd's Paper..... Four Single-Page Photo-Litho's.

### Blocks in Text.

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### The Public Fountains of Paris.



OR some time past the water supply from the Dhuis and the Vanne has been insufficient for the daily needs of the inhabitants of Paris, and in summer the administration has

been compelled to supplement it with water from the Seine, though the danger to public health from this source of supply is not unrecognised. This poverty in the matter of drinking-water has been one of the great anxieties of the Municipal Council of Paris, who have at length obtained a sufficient increase to the supply from various sources in the Department of the Eure. This series of operations, which has been attended by vigorous but really quite unjustifiable opposition on the part of those living near the sources of supply, has formed the necessary complement to the work undertaken thirty-five years ago by the eminent engineer Belgrand, to whom the sanitary improvement of the French capital is mainly due, though most of the honours of it (including that of monumental commemoration) have been passed on to his pupil, Darand-Claye.

Belgrand accomplished a great work, however, and entirely changed the state of things in Paris in regard to water supply. Not very long since it was extremely rare to find a house in Paris with a water service in every suite of apartments; it was rarely even that a whole house in a populous quarter possessed one sole tap to itself for the supply of several families. In those days water-carriers (now a nearly extinct institution) circulated in the streets, with their tubs bearing the stamp of the police authorities, and filled at the public fountains or at the reservoirs called "fontaines marchandes."

All this is ancient history; and in a little while, when every inhabitant of Paris will be assured of an ample water supply in summer and winter alike, the fountains formerly erected in the public streets will serve no purpose except for street watering and as street ornaments, or will be retained only as monuments of the past and artistic documents dear to archaeologists. In anticipation of this transformation, it may be of interest to give some account of this class of public works in Paris, many of which are well worth attention.

Though the numerous street improvements since 1855 have considerably modified the aspect of Paris, a good many of the old fountains still remain. Many, however, have disappeared, such as that fine fountain of the Cour Batave, designed by Sobre in 1791, and also the fountains of Ponceau, St. Victor (the work of Bernini), the Fontaine de Vaugirard formerly decorated by the statue of Leda which now adorns the Fontaine Medicis, that of the Palais Royal decorated with the sculptures of Guillaume Coustou, and many others, now forgotten, which found no grace in the eyes of M. Haussmann.

Confining ourselves to those which still exist, we will mention the principal erections of this kind in the different districts. In the First Arrondissement we come at once on the celebrated Fontaine des Innocents [see lithograph], which, in spite of many transformations, is still one of the most graceful creations of French art of the sixteenth century. As is well known, the general design is that of Pierre Lescot, and the nymphs are from the chisel of Jean Goujon. This fountain, now standing isolated in the centre of a square, was formerly placed against the wall at the angle of two streets. When it was removed, in 1786, into the Marché des Innocents, the sculptor Pajou, commissioned to produce a fourth façade, assimilated in a clever manner the style of the existing work. The monument consists of a square pavilion with four open arches, rising from a base consisting of six basins arranged one above the other in a pyramidal form, down which the water flows in cascades into a large circular basin.

We may just notice, in passing, the ancient fountain of the Halle au Blé, the last vestige of the Hôtel de Soissons, which the architect of the Bourse de Commerce has contrived to incorporate, in a kind of way, into his new work.

The Fontaine du Châtelet, like that of the Innocents, has been shifted from its old position. It is the design of Bralle, the figures and ornaments being by Boizot. It stands in the centre of a triple series of superposed basins, and has a palm-wreathed column surmounted by a statue of Victory. At the base, four sphinxes disgorge the water into the lower reservoir. It was Boizot also who sculptured the nymph which decorates the Fontaine de l'Arbre Sec, the stalactites and vermiculated rustications of which adorn the angles of Rue St. Honoré and Rue de l'Arbre Sec. This fountain, rebuilt in 1776 by

Soufflot, dates in fact back to the time of Francis I., when it was called the "Fontaine du Trahoir."

The Fontaine de Molière, Rue Richelieu, is the work of Visconti. The marble statue of the poet is seated in a circular niche, between Corinthian columns carrying an entablature adorned with a circular *fronton*. It was executed by Seurre, and the two allegorical figures which symbolise serious comedy and light comedy were executed by James Pradier.

The Fontaine Desaix, though destroyed a few years ago, merits a word of commemoration. It stood in the middle of the Place Dauphine, and was erected in 1802, after a competition in which Percier carried off the prize. The principal *motif*, which is preserved in the municipal museum, represents a young antique warrior crowning the bust of the Republican general.

Among the sculptural decorations of fountains we must not forget the graceful nymphs by Mathurin-Moreau and Carrier-Belleuse, which decorate the fountains of the Théâtre Française, erected in 1874.

In the Second Arrondissement two fountains only merit attention, both the work of Visconti. That of the Place Louvois recalls the site of the old Opera-house, where the Duc de Berry was assassinated in 1820. It has a circular basin of which the centre is occupied by a group of allegorical figures (by Klagmann) which support a vase. The second example, situated in the Place Gaillon, is decorated with a little Triton mounted on a dolphin. It is placed in a niche flanked by columns carrying an entablature.

The central quarters of Paris, being the most ancient, are naturally the richest in old monuments; and we find accordingly in the Third Arrondissement a number of fountains of considerable interest. The Fontaine St. Avoise, Rue du Temple, offers a pretty decorative design showing the arms of the city flanked by two dolphins. The mask carved on the Fontaine Bouchérat, Rue Turenne, is of fine character of work. This fountain is dated 1697. The Fontaine St. Louis, also in Rue Turenne, was erected in the seventeenth century originally; it was rebuilt in 1846 in a very poor style, and is entirely devoid of character.

Not far from here, in the Rue Vieille du Temple, is a fountain of some originality of form; a hexagonal erection terminated by a coved cornice, with a canopy-shaped termination over it. This fountain, erected in 1674,



is the oldest one in the Quartier du Marais, and is known under the name of the "Fontaine de l'Echaudé" [see lithograph]. That called "des Haudriettes," which is in a more severe style, dates from 1760. It is the work of Moreau Desproux, who was beheaded in 1793, and who, from 1763 to 1789, was "maître-general des bâtiments" to the city of Paris. In this fountain the water spouts from a lion's head in bas-relief, the work of Mignot, in 1765. Above, there is a moulded architrave surmounted by a triangular pediment supported by two consoles.

The Fontaine du Vert-bois, situated in the Rue St. Martin, has been recently restored. It is built up against an ancient boundary wall of the priory of St. Martin des Champs, the site of which is now occupied by the Conservatoire des Arts et Métiers; on a pedestal adorned with a lion's head in bronze, from which the water issues, there rise two rusticated pilasters supporting a cornice terminated by a cartouche crowned with a shell. Between these pilasters is a tablet on which is sculptured in delicate bas-relief an antique galley which symbolises the city of Paris.

This triform, with its elegant lines and projecting prow, is a far more decorative form of the Paris symbol than is the heavy galley which adorns the upper part of the fountain situated at the angle of the Rue St. Martin and the Rue Maubou, which gives the name to it. The Fontaine Maubou—one of the oldest in Paris—is mentioned in some documents dated as early as 1392. It is decorated with a bas-relief much impaired by time, and on which are traces of a vase surrounded by marine plants. It was reconstructed in 1733.

We are now in the city, that is to say in the heart of the ancient Lutetia (now the fourth arrondissement). Behind Notre Dame, in the middle of a shady square rendered still more sombre by the mass of the Cathedral overshadowing it, rises a fountain in the Gothic style, adorned with pinnacles and terminating in a crocketed spirelet. There is an open canopy which shelters a statue of the Virgin and Child: the Twelve Apostles are sculptured on the pedestal, and at the angles are angels trampling on dragons, through the mouths of which the water is poured into two hexagonal basins. This is the Fontaine de l'Archevêché, built from the designs of Vigoureux, in 1843, and decorated by Parfait Meurieux.

If we now penetrate into a narrow blind alley near the Rue St. Antoine, we find an elegant construction known under the name of the Fontaine "de Jarente" or "de Poissonnerie," built in 1783 from the design of the architect Caron. Two Doric pilasters support an entablature with a pediment, enclosing in its tympanum a vase surrounded with garlands. The whole is surmounted by a pyramidal cupola. Dolphins interlaced with cornucopias decorate a shallow niche between the pilasters, and on each side are the carvings of shells and aquatic plants which form the special characteristic of the style of that period.

The Fontaine Charlemagne, erected in 1840, offers no detail of interest, but we may notice in passing, behind the "marché des blancs manteaux," two steles adorned with bulls' heads which disgorge water into small basins; these are the "têtes-des-bœufs" fountains. The fountains of the Place des Vosges, erected under the Restoration, present nothing for remark.

The Fifth Arrondissement is also rather rich in relics of this kind. The best known is probably the Fontaine Cuvier, situated near the Jardin des Plantes. Heavy in design, and in a commonplace style, it makes a bad substitute for the one formerly erected on the same site by Bernini. It is the work of Vigoureux. The surbase, from which the water escapes through dolphins' heads, supports a group representing Natural History, surrounded by symbolic animals. The group is the work of Feuchères. On the acroterion is to be read the name of Cuvier.

Fragonard, the painter, made the design for

the fountain placed in the "Marché des Carmes," which, however, does little credit to his inventive genius. In the middle of a circular basin is a kind of pillar in the form of a double "term," representing Commerce on the one side and Abundance on the other, in the guise of young girls crowned with fruit and supporting a sculptured vase. Various "attributes" scattered about,—cornucopias, caducei, olive-branches, the arms of the city, &c.,—complete the rather heterogeneous decoration of the whole.

The opening of the Boulevard St. Germain necessitated the removal of the Fontaine Childebert, which now adorns the Square Monge. This fountain, which dates from the end of the seventeenth century, has a niche decorated with shells, between the pilasters, with an arch over, carried by two consoles, and decorated with dolphins on the extrados, with a vase in the centre from which depend aquatic plants. In the niche a human head in bronze forms the spout for the water.

There are to be noticed also the fountains named Valhubert, Pot-de-fer St. Marcel, and Poliveau; the latter, in the worst taste of the First Empire, consists of a monumental stele adorned with an eagle crowned with laurels.

In the Sixth Arrondissement is found the Classic fountain of St. Sulpice, bearing the impress of the cold and pompous art of Visconti. It is too well known to need a detailed description; it is sufficient to note that above the tier of basins for the cascade rises a monument adorned with Corinthian pilasters, and with circular niches occupied by statues of the great orators of the French ecclesiastical school—Fenelon, Bossuet, Flechier, and Massillon; the statues are the work respectively of Lanno, Feuchères, Desprez, and Fauginet. Oddly enough, this latter artist, whose name is not otherwise much known, is not indicated in any account of the monument, which dates only from 1847, and it is only chance that has given us the information which we have vainly looked for in official records. Close to this fountain, in the Rue Garancière, one may remark a fine mask in bronze of a human head, which delivers water into a basin on the ground-level. This is the Fontaine Garancière, constructed in 1715 at the cost of Anne of Bavaria, widow of the Prince de Condé.

The fountain of the Marché St. Germain is not without a certain character. It was the architect Voinier who, in 1802, modified and put in execution the design first composed by Détournelle in 1724. The bas-reliefs in white marble which decorate the four faces of the monument are the work of Espercieux. They symbolise Peace, the Arts, Commerce, and Agriculture.

The fountain which forms such an imposing mass at the end of the Avenue de l'Observatoire is the most recent in Paris. It dates from 1875, and is a powerful and energetic design by Carpeaux, who has modelled with his usual vigour the figures representing the four quarters of the world supporting the terrestrial globe. The rearing sea-horses at the base of the group, and the water-spouting turtles, are all the work of M. Frémiet; the decorative garlands were modelled by M. Villemillot. The Fontaine de l'Observatoire cost no less than 330,000 francs.

M. Davidou, who designed the plan of the last-mentioned fountain, was less fortunate with the Fontaine St. Michel, though it has a certain character of grandeur. It is unquestionably very well placed, and its façade, 26 mètres high and 15 wide, adorned with columns of red marble, looks striking enough in its situation at the angle of the Boulevard and the Place St. Michel; but the principal group, representing the archangel trampling down the demon, is terribly heavy. This group is one of the least fortunate works of Duret. Above the attic are six allegorical figures: Prudence, by Barre; Strength, by Guillaume; Justice, by Elias Robert; Temperance, by Gumery; Dominion and Moderation, by Debay. M. Jacquemart executed the two-winged dragons which pour the water into the basin, and the children sculptured in

the middle of the water and on the attic were the work of Mme. Claude Vignon, the recently-deceased wife of the present Minister of Finance, M. Rouvier.

One of the finest fountains of Paris, and that of which the architectural design is certainly the most noble and grandiose, is the Fontaine de Grenelle, in the Seventh Arrondissement, constructed 1739—1745, from the designs of the illustrious artist Bouchardon. This remarkable monument presents an *avant-corps* backed by a wall-screen 29 mètres wide and 12 mètres high. It is adorned with a fine Ionic order of coupled columns which support a triangular pediment. A figure in white marble symbolising Paris is seated on the surbase of the central portion; at each side are two statues reclining on urns, and representing the Seine and the Marne [see lithograph]. In the side wings the pilasters form three bays on each side, of which the centre one is adorned with the ship of Paris and the two others have niches with statues representing the Seasons. The same subjects are treated below in the charming bas-reliefs of the lower panels. Between the columns a Latin inscription records the origin of the fountain, the water from which is poured out from two dolphins' heads at the base of the central block or *avant-corps*.

The "stalactite" decoration of the podium of this fountain, a rather too favourite form of fountain ornament in French work of the period, is no doubt in bad taste and rather annoying to the eye; but in the main this is a work remarkable for its noble decorative character as a whole, and for grace of design in detail, and in these respects forms a striking contrast with some of the heavy and mannered works of the same class left by the artists of the First Empire. As an example of one of these we give an illustration of the Fontaine de Mars [see lithograph], in the Rue St. Dominique, opposite the Hôpital Militaire. It dates from 1806, and the author of the general design is unknown, but we know that it was a pupil of Pajou, Beauvalet, who executed the bas-relief on the principal face, showing the figure of Mars, and of Hygieia the Goddess of Health offering him a cup of water (presumably) which he seems exceedingly unwilling to taste. Probably there was some idea in it of a moral addressed to the army as to the advantage to their health of drinking nothing stronger than water; and as it was said at the time of the Franco-German war that the army was to a great extent demoralised by habitual indulgence in absinthe, there may be a point to the moral, though its artistic expression is absurd enough. Marine animals of a grotesque order complete this piece of stock mythology.

Although dating from the same year, the Fontaine de l'Égyptienne, Rue de Sèvres, is very superior to the last named. The design was by Bralle, or at all events it was erected under his superintendence, and represents with sufficient correctness the portal of an Egyptian Temple, of which the open bay forms a niche for a statue of a young slave whose head is ornamented with bands, and who holds in each hand a vase from which water runs into basins at the base of the pedestal. This figure, the work of Gecchter, replaced, in 1844, the original statue made by Beauvalet after a marble statue discovered, in 1738, at Hadrian's Villa at Tivoli.

In the Eighth Arrondissement we find at once, in the middle of the lawns of the Champs Élysées, four fountains almost identical in design, all by Hittorf; the Fontaine des Ambassadeurs, the Fontaine du Cirque, and those of Marigny and l'Élysée. They each have a circular basin surmounted by a vase whence the water falls in a cascade. Two of them are adorned with statues representing Diana and Venus in the midst of garlands; these are very mediocre works by Desprez and Duret. Nearly the same description applies to the fountain of the Square Laborde, erected in 1852, except as regards the sculptural part.

We pass over without mention many mere basins with simple jets of water which are found in the promenades of the same



Arrondissement, but which have no architectural character. Nor is there much to be said for the two little fountains erected by Davidou, in 1865, on the Place de la Madeleine; they are poor affairs, and their decoration at once pretentious and commonplace.

It is not the same with the fountains of the Place de la Concorde, which, with the Luxor obelisk, may be said to be the best-known features of Paris. They are identical in general design, and only differ in the statues which symbolise the sea and river divinities. In the middle of a circular basin divided by pedestals surmounted by pine-cone ornaments, six figures, separated by dolphins spouting water, are seated with their backs to the pedestal of a vase ornamented with various devices. Tritons and Nereids emerge from the basin surrounding the centre-piece, each one holding a fish which spouts up a jet of water. Above the vase is a group of symbolic genii and swans, and a central fountain-jet from the top. These fountains were erected during the period 1836-46, under the direction of Hittorff. Eleven artists contributed to their decoration; we may mention, among the best known of these, Feuchères, Debay, Lanno, and Desbœufs. One fact of interest may be noted; the fountain nearest to the Pont de la Concorde marks exactly the place where Louis XVI. perished on the scaffold on January 1, 1793.

The Pigalle and St. Georges' fountains, in the Ninth Arrondissement, have no architectural or historical interest; their only merit is to freshen the air on a site which in summer is exposed to the full heat of the sun. The Fontaine de la Trinité, which contributes to the decoration of Ballu's church on the axis of the Chaussée d'Antin, is a work of more importance. The porch of the church has three large bays, before which are three pedestals ornamented with bronze masks whence the water falls successively into basins disposed in tiers. The central pedestal is surmounted by a group in marble symbolising Charity. The two other pedestals support figures of Faith and Hope. The total effect is very good. The figures were modelled by Duret, whose work was interrupted by his death, and was completed by his pupil Lequesne.

The fountain of the Château d'Eau having given place to the monument of the Republic, the Tenth Arrondissement now possesses no fountains except the twenty-eight little fountains, all of the same design, put up in 1848, by public subscription, along the two foot-pavements of the Faubourg St. Martin. These small fountains, all in the same style, are decorated alternately with groups of Tritons and Nereids supporting a vase, surmounted by a child and swan.

We find in the Eleventh Arrondissement, at the angle of the Faubourg St. Antoine and the Rue de Charonne, a fountain in very dilapidated condition, but of which the decoration, dating from 1671, is still of interest. This fountain was constructed by order of Louis XIV. The principal portion is adorned with Doric pilasters supporting an entablature with pediment. Between the pilasters are panels with mouldings and filled in with aquatic symbols, &c.

The Fontaine de Montreuil, in the same street, dates from 1724; it is, however, of no interest otherwise, any more than the Fontaines Popincourt and la Roquette. The two latter have nearly the same decoration as that of the Fontaine de Charenton (in the Twelfth Arrondissement) and of the Fontaine de Charlemagne already mentioned. They each comprise a closed arch flanked by pilasters and surmounted by a small attic. Shells, aquatic plants, and lions' heads from which the water pours, form the almost universal ornamentation of the various fountains erected about the date of 1846.

The monument to the Republic, by Dalou, has been illustrated in our pages, and need not therefore be dwelt upon here; and the fountain of the Place de la Nation being still in course of construction, may be passed over for the present. We may mention, however, in this Arrondissement, the Fontaine Daumesnil,

which is no other than the old fountain of the Place du Château d'Eau. This monument, the design of Davidou, comprises a series of basins superposed, interrupted by flower-baskets and surmounted by two large vases, also superposed, whence the water falls in a cascade. Eight bronze lions, modelled by M. Jacquemart, spout jets of water into the lower basin. The general effect of this fountain is not bad in a decorative sense, though it has been the object of much adverse criticism of late.

The Thirteenth and Fourteenth Arrondissements possess no monumental fountains, and in the Fifteenth there is not much worth mention except the artesian well of Grenelle. This monument, 42 metres in height, comprises a large circular basement giving access to a staircase in open ironwork which rises spirally round a column crowned by a lantern; the staircase gives access successively to four hexagonal balconies at various levels. The object of this construction was to carry up and aerate the water, but unfortunately its ascensional force has never been sufficient to enable this idea to be carried out. The well was pierced and the whole construction made in 1833-41.

There is in the Sixteenth Arrondissement another artesian well hidden in the middle of a plantation of trees and shrubs, in the Square Lamartine, whence the water pours over some artificial rocks. The well was made in 1855-62. The artesian well of the Place Hébert (Eighteenth Arrondissement) is not yet, we believe, quite completed.

The two remaining Arrondissements of Paris contain some fountains, which need not, however, claim our attention; we may mention only that of the Marché aux Bestiaux (Nineteenth Arrondissement), which also for a long time decorated the Place du Château d'Eau, and made way, in 1869, for that by M. Davidou, which disappeared in its turn in 1882. This work has three concentric basins disposed in steps, the two upper ones out at equal intervals by pedestals each supporting two bronze lions projecting jets of water into an intermediate reservoir; the whole surmounted by a vase and cascade.

We have rapidly enumerated those of the Paris fountains which, either from their design or their antiquity, are most worthy of notice. With the new water supply, fed from the large reservoirs of Montrouge, Monilmontant, and Montmartre, as well as the supply from more recent sources, many of these old fountains will no longer serve any public need. It is to be hoped that they may nevertheless be allowed to remain. Dispersed throughout the different districts, these fountains, once so precious and now left to go to decay, add to the picturesque aspect of Paris, recall her ancient physiognomy, and contribute, with other old edifices, to break that monotony so common to modern cities, and that long perspective of straight streets which is the peculiar invention of "Hausmannisation." As Belgrand finely said, in his treatise on the ancient water supply—"For every stone ornamented with carving, every fragment of whatever kind, which falls under the hammer of the *démolisseur*, it seems as if the City of Paris tore away with her own hands her own titles of nobility!"

PRESENTATION OF A FOUNTAIN TO GLASGOW.—On Wednesday Sir Henry Doulton, of Lambeth, presented to the City of Glasgow the large fountain which was exhibited at the Glasgow Exhibition by his firm two years ago. It has now been re-erected near Nelson's Monument on Glasgow-green. Sir Henry complimented the Corporation upon having brought water from Loch Katrine. It was to him, he said, a great honour to present a fountain from which would ever flow Loch Katrine water.

ELECTRIC RAILWAYS IN THE UNITED STATES.—It is stated, says the *Newcastle Chronicle*, that by the close of the present year the electric railway mileage in the United States will be double what it was at the close of last year. By this showing there will be no insignificant measurement, seeing that there were completed in 1889 very nearly 1,900 miles of electric railway. In the course of three years 180 towns have adopted this system of locomotion, and the total number of passengers carried in this way last year amounted to 200 millions.

# THE PRINCIPLES OF PROPORTION AS PRACTICALLY EMPLOYED IN THE PARTHENON.

BY W. WATKISS LLOYD, F.S.A.

(With Illustrations.)

THE question is certainly open to discussion whether any especial value can attach to the execution of architectural works with scrupulous attention to exact numerical proportions when it is considered how relative dimensions, as presented to the eye of the spectator from different points of view, are apparently modified and, from the most favourably selected point of view, defy precise appreciation. The consonance of musical notes is dependent on the precise mathematical relations of the vibrations of the instruments which produce them, but they are exempt from any interference analogous to the perspective modifications of visual objects. Notes produced concurrently reach the ear together if they reach it at all, and there reproduce the original consonant vibrations. Dimensions, on the other hand, have diverse visual representations accordingly as they are seen under diverse angles at varying distances. A square opening,—as a window,—seen obliquely, will not be presented as a square, and even when seen directly from the front, the image produced will be inexact, and whether the square itself is made minutely exact, might seem not to matter very much. The upper diameter of an Ionic column, 20 ft. high, is found to be exactly one-sixth less than its lower diameter. The pleasingness of the effect no more depends on our knowledge of this fact than the satisfactoriness of a musical chord on knowledge of the exact mathematical relations of the notes; but what reason is there to think that the exactness in the architectural instance is as essential to the pleasurable result as it is in the musical?

All that can be said,—at least, what is to be said that is sufficient for our present purpose,—is this: that, at any rate, the greatest Greek architects worked under the impression that it was not enough to make the proportions of their buildings satisfactory in a general way; that they bestowed great pains in bringing the proportions which they found satisfactory within the compass of systematic schemes, and then in putting the dimensions so determined into execution with a degree of accuracy which is surprising even when regarded as a mere technical feat.

Furthermore, there is this to be said in justification of the study and the pains so unsparingly bestowed, that the result of these pains is found to have been triumphantly successful,—a realisation of marvellous majesty and beauty, and that the admiration which the works have evoked has always found expression in praise of the charm of their proportions.

That proportion, that just relation of parts, must be an essential characteristic of every fine work of art which is only a fine work in virtue of being a coherent whole, will be admitted by moderns as readily as it was assumed by the Greeks,—that the Greek architects also laid stress upon such minute accuracy in execution has at least this advantage to students, that it enables us to recover the principles of their system from their monuments with a degree of confidence which laxer practice might have failed to confirm.

It is due to the supreme interest of the genius of the Greeks that the elucidation of their views on proportion would deserve attention, though their application of it had been less successful than we find it; but having regard to what they achieved we may enter upon the inquiry with the fair anticipation that the principles which they teach will be introductory to a theory of architectural proportion which shall not be restricted in its application to Greek architecture, but susceptible of application to other even most contrasted styles. There must be, in fact, a general theory of architectural proportion, from which the schemes and systems appro-



appropriate to particular styles are developments; the advantages of commencing with the study of the Greek development are due to the possession of well-measured and delineated examples of very exactly executed works of admitted excellence and beauty. While, therefore, study approaches the subject on the one hand by considering independently what from the nature of the case are the principles to be assumed, on the other the exemplar works sometimes give hints as to the direction in which these principles are to be looked for, and then enable us to test our theory by actual practice.

Architecture has been called petrified music, and the analogy between the two arts has doubtless been recognised in the intimate dependence of both upon proportion. Many theorists, however, have been misled by it into a short cut by "the high priori road," and have attempted to solve all the problems of architectural proportion by the ratios of the notes of the musical—the diatonic scale. Certain coincidences have flattered them with a notion of success—coincidences which are inevitable, inasmuch as the simpler ratios are certain to recur in all the arts. But architecture is not to be tied down to the laws of another art. The musical ratios are controlled by one special physical fact which does not apply to architecture; it is, that the duplicate multiples and submultiples of the vibrations which produce a given note only reproduce the same note at differences of pitch, higher or lower. This law at once sets a limit to the number of ratios that can be included within the scale upon a particular key-note, but architectural visual proportions are exempt from any such limitation.

The true analogy holds good only when broadly interpreted with regard to art in general. Then we may say that in architecture, as in music, a harmonious composition will be governed by a scale of proportions limited in number and decided by the characteristics of the artist's conception of the design; proportions selected, but still comprising a series sufficiently numerous and forming a sequence with intervals of considerable uniformity, though not without variations in the interest of the resources of contrast.

The expression of definite character is obtained in both arts by appropriate selection of a scale of proportions,—the equivalent of a key, and the employment of the most important of these in varied combinations. The primary elements which architecture presents for regulation by proportion are the three dimensions of length, breadth, and thickness. A straight line, whether upright, horizontal, or oblique, may be divided into parts having definite proportions to each other; so the height of a column may be compared with the height of the entablature above it; or the breadth of a metope with the breadth of an adjacent triglyph. These may be conveniently called cases of rectilinear proportion,—proportion between parts of the same straight line, or between lines that are not at an angle with each other, as between the heights of two columns.

Comparisons between dimensions taken on lines at right angles to each other may be called rectangular proportions; such as those which may be established between the breadth and length of an apartment or a platform, or between the height or breadth of a colonnade or a façade. Areas of circles are to each other as the squares of their diameters. This is a case which will be found of importance in the comparison of columns of different dimensions associated in the same composition; they are often found to be proportioned by sectional area.

Quantities of any kind, and among them dimensions and areas, as compared together, may differ in any degree between the smallest possible degree beyond 1:0, and absolute equality, 1:1.

Degrees of difference between quantities within these limits are infinite, and a first distinction to be remarked is this, that certain quantities may differ from each other but stand in no proportion that can be pre-

cisely expressed in numbers; there are quantities which are incommensurable. This is the case, for example, between the sides of a square and its diagonal; and between the diameter and circumference of a circle. When we exclude these and the like cases from consideration, the proportions of commensurables are still infinite in number, and from these we may again, for our particular purpose, exclude those which involve very high numbers, which express either very great differences or very small, as 1:100 or 99:100 to take extreme cases.

In architecture, as in music, peculiar value is found to attach to simple proportions,—that is, to proportions which can be expressed in low numbers, with no further exception than proves to be recommended by the requirements of an exceptional design.

The general conception of a design in plan, as in elevation, will be independent, in most cases, of any definite reference to numerical proportions. The architect, no doubt, may try experiments; may say to himself, I will put to the test whether such-and-such proportions have or have not any special recommendations in effect, as a painter may set himself to try the capabilities of a new colour; but the more usual and desirable process of invention is for the imagination to originate a conception of considerable liveliness in the first instance. If this has a true artistic value, it will assuredly be found upon examination to involve a certain proportional fitness as its basis, and it is for the architect to elicit this and the requirements and consequences of it, even as a musician only when he takes pen in hand considers in what key the air is to be written down which has haunted him by fits and at last is attaining perfect development.

The foregoing conditions of the conceived design will, therefore, necessitate the adoption of certain proportions taken out of the general scale, and these will in turn demand that others, which are adopted for subordinate members or details, shall not be so near to them as to encroach on their effect and confuse it, and while sufficiently varied to suit the various exigencies of the design, shall still be not so numerous as to interfere with each other, and so frustrate an effect of concentration and unity.

The leading and imposed proportions will, in fact, decide in a general way the selection of a scale of proportions.

In the well-ascertained scale of proportions employed in the Parthenon, the advance of the terms towards equality—the proportion of a square—commences from 1:6 and proceeds by the successive ratios 2:7; 3:8; 4:9; to 5:10 = 1:2 or the double square; thence again by ratios having the common difference between their terms of 5; 6:11; 7:12; 8:13; 9:14; to 10:15 = 2:3. From this point the series is continued by ratios having the common difference between their terms of 1, the so-called super-particular ratios, 3:4; 4:5; 5:6; 6:7; 7:8; 8:9, &c. This change is required from the closeness of the intervals, the trifling differences, of the higher ratios of the former series.

The gradations of the scale of which the employment is traceable in the Parthenon, are therefore reducible to a very simple system of the series of super-particular ratios, supplemented by certain of those which have the difference between their terms of 5.

We must not, however, suppose that this scale has such an exclusive authoritative value as attaches to the ratios of the notes of the diatonic scale. The temple at Bassæ is executed with remarkable attention to systematic proportion, but the primary dimensions of the platform exhibit the ratio 2:5, which does not appear in the Parthenon scale at all. Considering that we are in possession of no inconsiderable number of notices and even treatises of the ancients on the subject of Greek music, it might seem that our knowledge of the theory of Greek music should be more satisfactory than of Greek architecture. It is not found so. The treatises are curiously unsatisfactory as to the musical theory; we search them in vain for any definition of a

chord, and of other principles also, but for the possession of which no satisfactory or useful theory could have existed at all. The music itself, which is written in terms at once so appropriate and so enthusiastic that it must have had high merits, has perished, and the musical literature that survives only perplexes us. In the case of architecture it is the reverse; the architectural treatises of the chief ancient writers on the subject have perished; we have but faint and confused echoes in Vitruvius, but then their executed works—the very finest of all, especially—remain to us, miserably ruined, no doubt, but still remain in sufficient preservation for us to recover invaluable information as to their original state. These remains, therefore, enable us to recover the equivalents of the architect's working drawings. We may be said to have succeeded—so well has the work been done—in recovering the illustrations of the text of the ancient treatises, and there is as good hope to recover the drift of the original text from the illustrations as might have been to reduce the illustrations from the text.

The general form and distribution of the Parthenon, both in architectural style and in plan, were in accordance with precedents, which were themselves the traditional outcome of developments from remote and unrecorded antiquity. We can perceive, however, with certainty that the primary element of the composition was the sacred naos,—the apartment or residence of the tutelary divinity as presented to us in subordinate examples. A portico free or *in antis* was added to this as an enhancement of dignity; and then, from the same motive in more important temples, the entire structure was surrounded by a general colonnade. A more spacious naos made necessary the support of the roof by columns in the interior, which indeed were introduced even in such a small temple as that at Ægina, without the same structural necessity. In the Parthenon, a second smaller chamber was added at the rear of the naos,—the treasury of both of the goddess and of the State under her protection.

The cella, including both naos and treasury or *opisthodomus*, is raised by two steps upon the platform of the ambulatory, and that again by a basement of three degrees so steep as to require intermediate steps to facilitate ascent at certain points upon the fronts and flanks.

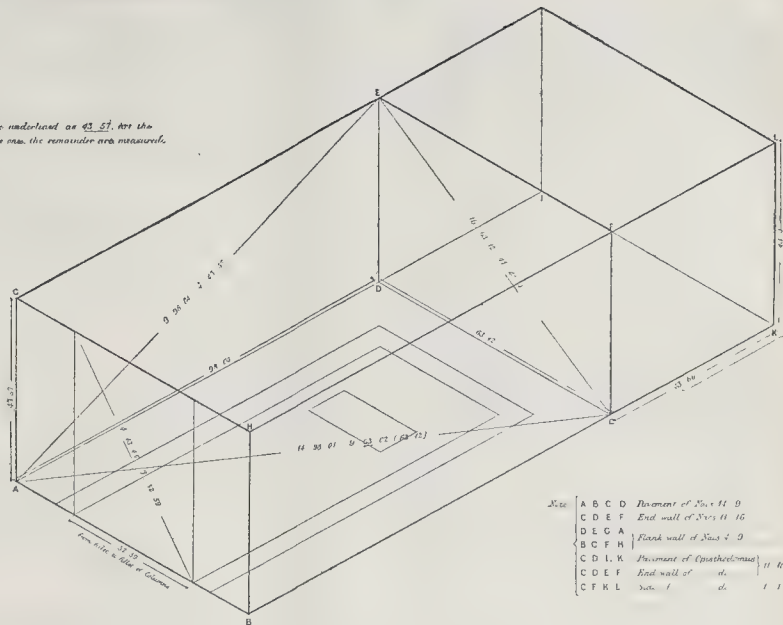
The colossal statue of the goddess Athene, in ivory and gold, was erect upon a sculptured pedestal at the further end of the naos, fronting the doorway. The frieze of the cella and its portico was enriched by the sculpture of the Panathænic procession; the metopes of the exterior colonnade all round were filled with groups in high relief, and the triangular pediments of either front were occupied by statues in the round,—the most important compositions of which we have either remains or record, of the finest period of Greek art. Divinities occupied the pediments, the metopes were devoted to heroic subjects,—the frieze exhibited an idealised representation of a contemporary human celebration. So much may be said of the unsparing cost which was lavished on this monument in completion of the proper dignity and charm of its architecture,—the subject with which we are here more immediately concerned.

The Parthenon was commenced and completed under the administration of Pericles; Ictinus is named as the architect, assuredly as supreme in his own art as Phidias, with whom he worked in sculpture. It occupies the very site of an earlier Parthenon, with which, as appears by traces of foundation, and various architectural fragments, it had very close agreement in positive dimensions. All the characteristic members of the Doric style were already and had long been decided; but it remained for the new Parthenon to supersede the very faintest suggestion of coarseness and clumsiness, and to display, and chiefly in virtue of the charm of unerring proportion, the compatibility of the loftiest and most impressive dignity with scrupulous refinement in finish and gracefulness supreme.



Note: The dimensions which are underlined are as given. All the calculated or approximate ones, the remainder are measured.

Note: The height given to the Naos is 113 ft. is conjectured.



OUTLINE OF THE NAOS OF THE PARTHENON.  
IN ISOMETRICAL PERSPECTIVE

A B C D	Roof of Naos 11 9
C D E F	End wall of Naos 11 16
D E G A	Front wall of Naos 11 9
B C F H	
C D I K	Roof of Epistyle-naos 11 6
C D E F	End wall of do. 11 6
C F K L	Side wall of do. 11 1

Scale: 0 10 20 30 40 50 60 70 80 90 100 Feet

The temple then, as technically described, is Doric Octostyle, Amphiprostyle, peripteral. By the name, the Parthenon, it is indicated as the Chamber of the Virgin Goddess,—that is, of Athens. It is sometimes referred to as the Hecatompedon,—the Hundred foot temple,—a title which is justified by the breadth of its platform on the upper step, exactly 100 Attic feet. The same title is appropriated in the inscriptions to the naos specially, and here we find the 100 ft. accommodated in its full length from partition wall to entrance.

The presumptions are very strong in favour of the original model of the Doric column having been derived from Egyptian examples; but, however this may be, the developed and completed Doric style betrays most positive imitation in stone of the details of wood construction. The triglyphs represent the exposed ends of beams resting on the architrave and grooved vertically to promote the descent of moisture across the circular ridges of the grain. The mutules and guttes below the cornice represent tenons and trenails transformed into ornaments by regularity and repetition.

The most important modification, which was induced of necessity by the substitution of marble for wood, is the reduction of the extent that could be spanned by a single beam. But for the respect commanded by the precedents of sacred structures built solely of wood, it is conceivable that the Greeks might have developed the construction of arches, and even of vaults,—an arcuated architecture; but apparently the model was too strongly established to be varied from; the vast stone temples of Egypt were not unknown; and the mountains and quarries of Hellas furnished the beautiful material marble in abundance; and the reduction of span, the closer spacing of supports which the employment of it involved, had the great recommendation of enhancing the expression of solidity and dignity.

Man, according to the dictum of one of the ancient Greek philosophers, is the measure of everything, certainly of everything which presents itself in relation to man, to his haunt,

his appreciation, or employment. It is among the perfections of the Parthenon that the magnitude of its parts are proportioned to its constructors with such happy effect. Humanity forfeits its dignity and sinks into insignificance when confronted with its own works in the pyramids. Men might crowd in any multitudes about the colossal columns of the hypostyle hall of Karnac, but to one who took in the entire scene they would appear little better than a swarm of ants.

The columns of the Parthenon have a bulk which is effective to awe, but not to oppress or to degrade the spectator who approaches and passes between them. Their diameter, 6.25 ft., exceeds the height of men in general very decisively, yet that is all, and the visible or semi-girth is beyond a man's power to encompass in an embrace. Dignity again is asserted by the degrees of the basement being too steep for easy ascent, yet not so proportioned between tread and riser as to preclude the insertion of one intermediate accommodating step.

One of the most constant applications of definite proportion in Greek columnar architecture is between the length and breadth of the basement, taken either upon the proper stylobate or a lower step.

The following are the proportions of the basements of a number of Greek temples in the order of approach to equality of sides:—

Bassæ :	2 : 5 (= 4 : 10) :: 51.892 : 129.732*
	(52.340 measured?—steps uncertain.)
Doric Parthenon and Theseum :	4 : 9 (= 4 : 9)
Ægina :	1 : 2 (= 4 : 8)
Priene :	6 : 11 (= 4 : 7.33) :: 69.600 : 127.270
Ionian Sminthium :	5 : 9 (= 4 : 7.2) :: 73.705 : 132.67
Teos :	4 : 7 (= 4 : 7) :: 72.332 : 125.978

The stylobate of the Parthenon is very

\* This proportion comes out exact on the line of the lowest step by measurement of the engraved plan, Pl. VI., Cockrell.

accurately set out with all its angles right-angles; the measured dimensions are:—

100 Attic feet=101.341 : 228.141 on flank.

The length of the flank, if deduced from the front by the proportion 4 : 9, would come out 0.124 less, an inaccuracy of 1½ in. which may seem of little consequence in such an extent, but is much in excess of the differences which will require to be allowed for where smaller dimensions are in question.

Two other comparisons of over-all dimensions may be made, namely, of the full height with the breadth of the front and with the length on flank.

Breadth.	Height.
14 : 9 :: 101.341 : 65.148 (measured 65.185)	
Height.	Length.
2 : 7 :: 65.185 : 228.147 (measured 228.141)	

If we assume the measured length of the flank as the basis of our calculations we have these results:—

Measured.	
9 : 4 :: 228.141 : 101.396; cf. 101.341 (err. +0.055)	
14 : 9 :: 101.396 : 65.1825; cf. 65.185 (measured)	
2 : 7 :: 228.141 : 65.183; " "	

By this process the calculated height comes out in agreement with the measured, but the breadth of front is shown as 0.055, or nearly ½ in. in excess of measured. It will be observed that these three important dimensions are regulated by proportions which fall into series as having a common difference between their terms of 5; 2 : 7 : 4 : 9 : 9 : 14.

It must, at the same time, be observed that if the proportion of the breadth to height of front and length of flank respectively are fixed at 4 : 9 and 14 : 9, the proportion of height to length comes out of necessity as 2 : 7.

The ratios may be thus represented:—

18 : 28 : 63
9 : 14 : 4 : 9
2 : 7

Any difference in the height of the front would have disturbed this harmony; but we are not to suppose that it was obtained by

violently forcing the architectural members into it as into a predetermined frame. We must conceive the concern of the designer to be to conciliate appropriate and expressive proportions of the members of the façade with some simple circumscribing proportion; the proportions which we have detected were the solution of his problem, obtained after we cannot tell how many trials and comparisons.

The temple at Bassæ is said by Pausanias to have been built by the same architect as the Parthenon; the height of the front is here proportioned to the breadth of the top step by the same ratio, 3:4, which is employed in the other hexastyle Doric temples of Sanium, Rhamnus, and the Theseum.

$$4:3::48:221 \text{ measured: } 36.165 \text{ (cf. } 36.014 \text{ measured.)}$$

For this temple we have not the same secure basis of full and fully-verified measurements as Mr. Penrose has provided us with in the case of the Parthenon. There is no doubt, however, that the main horizontal rectangle had the proportion of 2:5. According to the engraving this comes out most exactly in the length and breadth of the cornice which plumbs about the middle of the second step.

The full height compares with the length of the top step in the ratio 2:7, the same as in the Parthenon,

$$7:2::125.614:35.885 \text{ (cf. } 36.014 \text{ measured.)}$$

The general proportions of the temple, however, are very contrasted, from the greater narrowness of plan on the one hand and on the other the squarer proportion of the front.

In this Phigælian example the architect secures his three cases of leading circumscribing proportions, though to accommodate other harmonies he does not confine himself to three terms.

The 101,341 ft. of the breadth of the stylobate of the Parthenon was formed of seven segments, six joints of which were accurately covered by the lower drums of the six interior columns of the octastyle portico; the determination of the places of these joints will therefore give the dimensions of the columniations—that is, the distance on plan of these columns from centre to centre.

The problem, however, is affected by the circumstance that, by the traditions of the Doric style, the columniations at the angles are somewhat reduced, and to a greater extent than is made up for by the equally traditional requirement of somewhat extra stoutness of the angle columns, and then by the fact that the end segments of the step have to accommodate the entire diameters of the angle columns.

In the first instance, therefore, the architect had to decide the degree of excess required for the two angle segments; the remainder of the front after deduction of this joint excess, divided by seven, will give the lengths of the six intermediate stones from joint to joint, and thus the columniation required.

The seven segments of the step correspond in a general way to the seven segments of the architrave which span the columns above; and these, in turn, correspond severally to the joint breadths of two metopes and two triglyphs,—that is one whole and two half triglyphs,—except that each of the extreme segments is required to provide space for an additional half triglyph.

If, now, we deduct the breadth of a semi-triglyph from each end of the step,—or the same thing, a complete triglyph from the entire step and divide the remainder by seven, we shall find that we obtain the normal columniation with the greatest accuracy.

This process, of course, assumes that the architect had already determined on the breadth of the triglyph 2.786,—an assumption in which no more is involved than that all the members of the architecture were under consideration together, and every one subject to reconsideration and adjustment until its relation to the whole was determined as this whole advanced to consistency and completion.

$$101.341 - 2.786 = 98.555 \div 7 = 14.079 + 1.393 = 15.472$$

$$225.741 - 11 = 225.355 \div 16 = 14.084 + 11 = 15.468$$

The angle segments of the steps on the

east front are as, measured, 15.478, and 15.367, to compare with 15.472 as thus deduced; and the calculated 15.468 on flanks compares with measurements 15.468, 15.449, 15.531, 15.443,—comparisons which are to be accepted as coincident.

The columniations of the interior columns on the east front are 14.078, 14.106, 14.113, 14.084, 14.115, giving an average  $(70.496 \div 5 =)$  14.099 to compare with the calculated 14.079.

The flank columniations, which by calculation as given come out 14.084, have variations among themselves which may be regarded as considerable, ranging, in fact, between the limits of 14.141 and 14.052; but the average of these extremes is 14.096, and when we take the average of consecutive triplets or quartets of columniations, we find that the result gives wonderfully close coincidences. The inference is that exact care was taken in deciding the place of every third or fourth column, but that either for the sake of avoiding over-anxious uniformity or from disregard of slight variations, so long as they were debarred from becoming cumulative, the joints of the stylobate which placed the intermediate columns were settled with less scrupulous care.

The north-east angle columniation on flank for some reason is abnormally open at the expense of its neighbour, which is reduced to 13.983; excluding this one, the rest follow on, and average as shown below.

The angle columniations, indeed, are remarkably irregular:—

$$6.085:6.181 \text{ East. } 6.226 \text{ N.E. } 6.160 \text{ S.E.}$$

$$6.099:6.176 \text{ W. } 6.130 \text{ N.W. } 6.123 \text{ S.W.}$$

But if we take the measurements from the angle of the steps to the axis of the fourth columns, we find them identical, a proof that these irregularities were deliberately admitted while controlled within strict limits.

From north-east angle of flank to south-east.

$$\begin{array}{l} 14.052 \\ 14.124 \\ 14.110 \\ 14.079 \\ 14.093 \\ 14.088 \\ 14.066 \\ 14.113 \\ 14.089 \\ 14.068 \\ 14.124 \\ 14.084 \end{array} \left\{ \begin{array}{l} 56.305 \div 4 = 14.091 \\ 42.275 \div 3 = 14.091 \\ 42.268 \div 3 = 14.089 \\ 42.276 \div 3 = 14.092 \end{array} \right.$$

On the south side by like process we obtain the consecutive averages 14.090, 14.090, 14.087, 14.086.

The extents from north-east angle of step to axis of fourth column front and flank are identically

$$43.566 \left\{ \begin{array}{l} 15.367 \\ 14.115 \\ 14.084 \end{array} \right\} \left\{ \begin{array}{l} 15.531 \\ 13.983 \\ 14.052 \end{array} \right\} 43.566$$

The like at south-east angle,

$$\begin{array}{l} 15.478 \\ 14.078 \\ 14.109 \end{array} \left\{ \begin{array}{l} 43.662 \\ 14.060 \\ 14.069 \end{array} \right\} \left\{ \begin{array}{l} 15.468 \\ 14.060 \\ 14.069 \end{array} \right\} \rightarrow 43.637$$

The like at south-west angle,

$$\text{front, } 43.626; \text{ flank, } 43.652.$$

The like at north-west angle,

$$\text{front, } 43.784; \text{ flank, } 43.647.$$

As the centre flutes of the columns are adjusted very accurately midway upon the joints of the top step, it must have been in laying the stones of this that the precautions were taken which set very positive limits to the variations, trifling as they may seem, between the columniations. In result, the precise axial line of the plan divides the central columniations of the front with an excess in each case to the right of the spectator,—about 1 in. on the east and  $1\frac{1}{2}$  in. on the west.

The free space between the cella-wall and the columns of the peristyle exceeds the inter-column of the peristyle.

$$\begin{array}{l} \text{From cella-wall to edge of top-step on} \\ \text{flank} \dots \dots \dots 15.330 \\ \text{Deduct diameter of column and margin} \\ \text{of step} \dots \dots \dots 6.410 \end{array}$$

$$8.920$$

This dimension is to the average inter-column as 8 to 7; that is, exceeds it by one-seventh.

$$8.920 \div 8 = 1.115 \times 7 = 7.805 \text{ to compare with } 7.827 \text{ for ordinary inter-column as deduced.}$$

The same proportion rules approximately the excess of the interval from step of Pronaos to edge of top step on the front, above corresponding interval on flank.

$$7:8::15.00:17.143 \text{ (cf. } 17.270 \text{ measured.)}$$

The columniation thus obtained and verified is divisible between two semi-diameters of a column equivalent to one complete diameter, and the intermediate inter-column. We find that this was done by dividing it into nine parts and assigning five to the inter-column and four to the column.

$$14.09 \div 9 = 1.5655 \times 5 = 7.827 \text{ Intercol.}$$

$$14.09 \div 9 = 1.5655 \times 5 = 7.827 \text{ Intercol.}$$

The measured diameters of the ordinary columns have the slight variations from this, and amongst themselves, of 6.245 on east front and 6.251 on west and north, by average of all the columns that Mr. Penrose found could be measured.

(The  $\frac{1}{8}$ th of an inch is only 0.104.)

The diameter of the column, therefore, compares with the columniation in the ratio 4:9 which is the proportion also of the general plans of the stylobate.

The full average diameter of the angle columns from fillet to fillet, is 6.368, showing an increment of 0.138, or somewhat less than  $\frac{1}{8}$  in.

The question as to the determination of the precise increment is one of those which are mixed up with the problem of the general proportions of the column.\*

W. W. L.

## NOTES.

THE way in which, in a sense, the metropolis has taken possession of a great part of the Upper Thames during the last few years is very noticeable, and in some respects regrettable. Thus the Quarry Woods, below Great Marlow, have now quite lost their quiet sylvan character. There is nothing to be said against the small houses in the chalet style which have been erected at various distances in these woods along the river bank. The scene is bright and gay, but it is essentially artificial. The natural character of the scenery has been lost, and Quarry Woods and the neighbouring parts are rapidly becoming to the London of to-day what Twickenham and Richmond were to the London of fifty years ago. The lover of peaceful river scenery must go above Henley; in any reach below that he is sure to come across fanciful house-boats and villas, but he will not find the natural scenery of the Thames. But there is another aspect of this increase of river-side villas and moored house-boats. That is the sanitary aspect. It is obvious that the great increase of buildings, not only villas, but larger houses and hotels, will sooner or later utterly pollute the water of the Thames, which is not only for the present the main supply for London, but for numerous towns and villages along the banks of this river. In these same Quarry Woods to which we have alluded,—not on account of anything very special about them, but as typical of the modern Thames,—may be seen boards advertising further sites for buildings. Thus it is evident that every year buildings on the banks of the Thames will become more numerous, and railway facilities will increase. This being so, it is high time that before another summer comes round the Local Government Board should seriously consider what is in future to be done with the sewage of the houses rapidly rising from Henley to Kingston.

THE present is the time when more persons are in rural districts than at any other season of the year. Landed proprietors are now at home. We cannot, therefore, too

\* To be concluded in our next.



strongly impress on all owners of cottages the desirability of inspecting them carefully, and at any rate spending a small sum on whitewashing and cleaning interiors. There is nothing more conducive to health than washing or repapering walls; there is nothing which is more neglected, even by comparatively careful landlords. There is nothing which is a more constant source of village epidemics than absence of wall-cleaning, and there is no work which is less costly. In fact, a great many landlords habitually have the walls of piggeries and cattle-houses washed who scarcely ever use the same precaution in the cottages of their labourers. Again, also, it would be very desirable if coloured walls were more in vogue in cottage bedrooms than they are; when walls are papered they soon, in many cases, become untidy, and in many cases the paper is left on for years, becoming a fertile source of infection. In most cases, also, when a cottage bedroom is repapered, the country workman puts the new paper on the top of the old, instead of first stripping the walls. But the truth is, that the more the subject of cottage repairs is considered, the more evident it is that the only way in which these buildings can be kept in a proper state is by systematic inspection by competent sanitary authorities. Unfortunately, however, the rural sanitary authorities are often very lax in the performance of their duties. "Quis custodiet ipsos custodes?"

THE coach accident in the Lake District has directed public attention to the state of the roads in that part of England. There is no doubt that when much coach traffic exists the roads should be surveyed by thoroughly competent engineers from time to time. We can see no reason why an inspection of a coach road should not be undertaken by the Board of Trade at the beginning of each year. In other parts of the country residents must look after their own interest. But it is much to be hoped that the County Councils will introduce a higher class of road surveyors than those usually appointed by Vestries and Highway Boards. The ordinary road surveyor has absolutely no engineering knowledge, and his only object is to spend as small a sum on the roads as possible.

ON the rear portion of the site of the proposed City Bank in Ludgate-hill, opposite the Old Bailey, a considerable piece of mediæval walling, composed of Kentish ragstone cemented together by a very fine quality of mortar, has been revealed in clearing the site and digging for the foundations of the new buildings. By the courtesy of Mr. T. E. Colcutt, the architect of the building, and his clerk of the works on the spot, we have had an opportunity of seeing this piece of wall, which extends along the whole of the south side of the site, under the pavement in Pilgrim-street, and runs from east to west. It undoubtedly forms a continuation of the wall which was met with some few years ago a little to the westward, when Little Bridge-street was being widened, and which was described by us at the time, and was again referred to by us last year (see *Builder* for June 15, 1889), when we gave a sketch of an old tower brought to light by the widening of Ludgate-hill. The wall is about 9 ft. in thickness, and contains here and there what are apparently Roman tiles, indicating (as was the fact) that the wall was partially built of the debris of an older structure. In order to construct the vaults on the south side of the new building it is necessary, unfortunately, to break-up and remove this piece of walling; and the work of its removal (a very difficult task, owing to the strength of the wall) is now in progress. The wall is mentioned in Lambert's "History of London" as having been ordered to be built in 1274 (see *Builder* for the date previously mentioned, p. 449). It formed no part of the London wall proper. It was described in the King's order to the citizens as running from Ludgate westward behind the houses to Fleet Ditch, and thence

southward to the Thames. This wall practically added to the City an area about the size of an average West-end square, including Playhouse-yard, where the *Times* office now stands. But the precinct thus enclosed was not then subject to the jurisdiction of the Lord Mayor.

IT is stated in the *Times* that the Earl of Aberdeen has sold to Mr. James Mason, of Eynsham Hall, Oxfordshire, the lease of his town residence, No. 27, Grosvenor-square. This house,—until lately No. 24,—stands on the square's western side; it is conspicuous for its new stone and red brick elevation, its narrow and lofty portico having a large scallop shell carved beneath the pediment, and its high central *fronton*. Here, as likewise in St. James's-square, students of London topography will be at fault if they have not kept record of the changes made in the postal addresses and in the houses themselves. Eight years ago No. 37,—now 42,—on the southern side was Lord Aberdeen's; two doors away stands the historical "No. 39,"—re-numbered 44,—where, as Lord Harrowby's guests, on the evening of February 23, 1820, the Cabinet Ministers narrowly escaped from the plot which Thistlewood and his "Cato-street" conspirators had laid for their assassination. The present Lord Harrowby's house is marked by its wide bay front, and, together with two or three of its neighbours on that same side, by the fine old railings and wrought-iron work carrying lamp-holders and link extinguishers. Many of the houses, however, have been rebuilt within recent years, and in varied styles very different from those of their predecessors. The earlier No. 23,—site of the present No. 26,—was built, we have read, by Robert Adam in 1773 for Edward, twelfth Lord Derby, who, in 1797, married Miss Farren. Lord Shaftesbury, the philanthropist, lived at the old No. 24. The square was originally laid out in or before 1716 by Sir Richard Grosvenor, who had inherited the Audley property which Mary Davies had brought in marriage to his father; the central garden was planned by Kent.

THE Vestry of St. Martin-in-the-Fields have lately informally thrown open to the public an out-door gymnasium in Drury Lane, which occupies part of the site of a disused burial ground lately utilised as a recreation-ground, with shrubberies, &c., more especially adapted for aged people. The Vestry, thinking that more provision should be made for the poorer children in this crowded locality, decided to convert the ground into a playground. Consequently, upon the recommendation of their Surveyor, the centre groups of shrubs have been taken away, the surface covered with tar-paving, and swings, horizontal ladders, parallel bars, see-saws, &c., erected. A small portion of the foreground has been retained (and seats placed therein) specially for the accommodation of the aged people. The place is highly appreciated by the children, and one has only to visit it to see that the Vestry have done well in providing such an excellent playground in this locality. The paving works were executed by Messrs. Bradshaw & Co., of London and Manchester, and the gymnasium apparatus supplied by Messrs. Piggott Bros., of London, the whole being planned by and carried out under the immediate supervision of Mr. Chas. Mason, Assoc. M.Inst.C.E., Surveyor to the Vestry. Other parishes will do well to copy the example thus set them by the "royal parish" of St. Martin-in-the-Fields.

DR. BARRY'S Report to the Local Government Board upon the General Sanitary Condition of the Soulecoates Rural Sanitary District, not apparently made in consequence of any special outbreak of disease, shows nevertheless circumstances in the district very unfavourable to the maintenance of health. According to the Report, the cottages throughout the district are as a rule well built, and almost all have doors and

windows at the back as well as at the front; but in general "there is inefficiency of surface drainage about dwellings, the ground surface at the back in a large proportion of cases being neither properly guttered nor paved, and in some instances the slope was found to be actually towards dwellings, thus causing dampness of foundations. In addition, a considerable number of houses are unprovided with eave spouts, and as a result dampness of walls and basements is very general in the district." The water supply is mostly from wells, and even where the mains of the Hull Corporation have been laid, the inhabitants generally still draw from their old wells. What these are likely to contain is shown in the following extracts from the Report:—

"The house drains throughout the district are very defective, being constructed frequently of rubble or of agricultural pipes, and often containing in their course numerous unnecessary catchpits. The ground along the course of such drains is necessarily permeated by filth. Hitherto apparently no supervision of any kind has been exercised over the connexion of the house-drains with the sewers, and as a consequence these communications have been irregularly made. The drainage from mansions is, as a rule, discharged into cesspits, excavated to a depth of some 20 to 60 ft. Generally speaking, no attempt has, I understand, been made to render them watertight, and as a result the sewage soaks into the surrounding soil, or, where the cesspool is sunk to the chalk, finds its way into the water-bearing stratum, to become perhaps a grave source of danger. The danger is intensified in those cases,—of which I understand there are several,—where a boring has been made into the chalk for the express purpose of getting rid of the sewage amongst its fissures. I was furnished with a list of some twenty of these cesspools which were stated to be in existence in the district. Cesspools of this sort are not only a danger to particular local water supplies, but some of them appeared to me to be so situated as perhaps to compromise certain of the sources of the Hull water supply.

The privies are almost all constructed on the Hull system, having each a small fixed receptacle under the seat. These receptacles are not, as a rule, cemented or otherwise rendered watertight, and consequently allow of the percolation of liquid on to, and into, the soil. In a few instances paths have been provided. The larger houses are furnished with indoor waterclosets, which are mostly in direct communication with unventilated cesspits or sewers. The soil-pipes are frequently unventilated, or are furnished with a pipe one or two inches in diameter, which is carried to the roof. In only one instance did I see a soil-pipe properly ventilated by means of two openings on the house drainage."

ANOTHER inquiry, also conducted by Dr. Barry, has been made to ascertain the general sanitary circumstances and administration of the Urban Sanitary District of Rawdon, with respect to which complaints had from time to time been made to the Board of default by the Sanitary Authority; and of which it is significantly remarked, "The Board could learn nothing from the reports of the Medical Officer of Health." In regard to general conditions we read of "sewerage of a piecemeal and makeshift character," drains composed in many cases of loose rubble, houses back to back; and that, "with the exception of a single pipe-drain to silence a particular complaint," no attempt has been made by the sanitary authority to provide for the needs of the district. A double-column schedule is given showing the nominal provisions of the by-laws, and the evidence as to how far they are carried out; of which the following is a portion:—

By-laws.

"16. Every person who shall erect a new building shall cause every wall of such building to have a proper damp-course of sheet lead, asphalt, or slates laid in cement, or of other durable material impervious to moisture, beneath the level of the lowest timbers, and at a height of not less than 6 in. above the surface of the ground adjoining such wall.

Actual state of things.

Damp-proof course absent. It is stated that the provision of damp-proof course in the case of small houses has never been enforced in the district. In certain houses in course of erection the cellars were observed to contain a quantity of water, and the walls to be damp considerably above the ground level.



*By-laws.*

25. Every person who shall erect a new building shall cause every party-wall of such building to be carried up 9 in., at the least, in thickness—

(1) Above the roof, flat, or gutter of the highest building adjoining thereto to such height as will give, in the case of a building of the warehouse class or of a public building, a distance of at least 3 ft., and in the case of any other building a distance of at least 15 in., measured at right angles to the slope of the roof, or above the highest part of any flat or gutter, as the case may be;

31. A person who shall erect a new building shall not place the end of any bressummer, beam, or joist in any party-wall of such building, unless the end of such bressummer, beam, or joist be at least 4½ in. distant from the centre line of such party-wall.

*Actual state of things.*

Instead of the party-walls being carried through the roof, they are frequently only carried to the level of the ceiling of the topmost story. In no case have the particular provisions of this bye-law been carried out.

In practice the Sanitary Authority, far from requiring a 9 in. interval within the party-wall between the joists of contiguous houses, has permitted such joists not only to meet but even to pass through party-walls and to overlap one another. Moreover, the roof timbers of adjoining houses are in all cases continuous.

*By-laws.*

53. Every person who shall erect a new domestic building shall provide in the rear of such building an open space exclusively belonging to such building, and of an aggregate extent of not less than 150 sq. ft., and free from any erection thereon above the level of the ground, except a water-closet, earth-closet or privy, and an ash-pit.

He shall cause such open space to extend, laterally, throughout the entire width of such building, and he shall cause the distance across such open space from every part of such building to the boundary of any lands or premises immediately opposite or adjoining the site of such building, to be not less in any case than 10 ft.

*Actual state of things.*

Despite the elaborate provisions contained in By-law 53 for securing through ventilation to houses, houses are at the present time being erected at Little London, with the approval of the Local Board, on the back-to-back plan.

*By-laws.*

61. Every person who shall erect a new building shall, in the construction of every drain of such building, other than a drain constructed in pursuance of the by-law in that behalf for the drainage of the subsoil of the site of such building, use good sound pipes formed of glazed stoneware, or of other equally suitable material.

He shall cause every such drain to be of adequate size, and, if constructed or adapted to be used for conveying sewage, to have an internal diameter not less than four inches, and to be laid in a bed of good concrete, with a proper fall, and with watertight, socketed, or other suitable joints.

*Actual state of things.*

By-law 61, Clause II. The requirements with respect to the concrete bed for pipes are seldom enforced. The Sanitary Authority seemingly consider disturbance of drains through subsidence of the soil about them as inevitable, and accordingly prefer the joints to be made of clay puddle.

There is plenty more of the same kind; but this is sufficient to show with what kind of conscience the Sanitary Authorities of the district referred to look upon the grave responsibilities of their position.

**T**HE opening meeting of the biennial gathering of the members of the amalgamated societies of German architects and civil engineers was held in Hamburg on Monday last, several preliminary committee meetings of the official deputies of the various societies having taken place during the preceding week. Some 1,300 members were present to hear the opening address of the President, Herr Wiebe, of Berlin. After transacting certain routine business, the President of the Hamburg Arch. and Ing. Verein delivered the opening address, the title of which was "Hamburg and its Buildings." Herr Hobrecht, Berlin, then read a highly-interesting paper on "Street Building in Cities, with special regard to the future requirements of underground connexion." Both papers were well received. After the lectures, the new harbour works were visited and inspected. We hear that the next biennial meeting (1892) will be held at Leipzig.

**W**E hear that the new Mont Blanc shelter hut, which will at the same time serve as an observatory, is now complete. The site chosen is the highest that has been ever used for a similar purpose. The parts of this timber hut (which has been designed by an engineer, M. Vallot), making some 112 loads, together with ninety loads of furniture, scientific instruments, tools, victuals, &c., were carried up to the ground by Chamounix guides and bearers, between June 15 and July 31. The erection proper took M. Vallot, together with seven helpers, four days, during which time the party was housed in a provisional tent, and went about their work in costumes similar to those worn by the Esquimaux. Bad weather and continual mountain sickness of two of the party then compelled them to descend before completing the interior arrangements and supplementary constructive parts. Some days later the same party (this time accompanied by a lady who wished to see to the comfort of the interior of the new erection, and by an American astronomer, who had undertaken to superintend the placing of the instruments) again made the ascent, and three days were still necessary to complete the work. The hut, which has been lined with several layers of tarred felt to keep out the damp, is divided into two rooms, one of which, containing nine beds, will always be open to tourists; whilst the other, in which four visitors would find fairly comfortable accommodation, will serve for observatory purposes, and can only be visited with a special permit.

**A** CIRCULAR signed by Mr. John Leighton, F.S.A., draws attention very opportunely to a scheme which has been before mooted, and the idea of which we have before supported, of forming a main central avenue and drive from Park-square through Regent's Park, and over the centre of Primrose-hill. Mr. Leighton reminds us that the open space on Primrose-hill was originally acquired at the instigation "of that arch economist Joseph Hume, M.P." when the whole locality was threatened with building speculation, and when it was part of the open country round London. It is a valuable open space with which, however, nothing much has hitherto been done beyond preserving it as an open space. The idea of forming a drive and avenue connecting this and Regent's Park is a fine one, and would, as Mr. Leighton observes, give an uninterrupted line of four miles from Whitehall to Hampstead; but to make it altogether a veritable "Champs Elysées" worthy of London, the scheme ought, to our thinking, to be combined with a complete laying-out of Primrose-hill as an ornamental park; an object for which the nature of the site affords great advantages.

**W**ITH the commencement of what is called the "silly season" the *Times* starts at once with one of its architectural crazes, a long large-type article returning to what may be called the "Westminster Hall folly," and endeavouring again to justify it and represent it as an admirable piece of work. The *Times* never gives this kind of prominent position to architects writing on architectural subjects; and taking this into account, along with the obvious bias of the article, we shall probably not be wrong in concluding that Mr. Shaw-Lefevre has again been promoted to the position of anonymous critic on his own schemes. The whole article, at all events, is simply another endeavour to throw dust in the eyes of the public as to the real nature of this ill-judged piece of work, and to make out that the added rooms (added without practical reason, purpose, or forethought, as the architect's evidence plainly showed) are by no means so useless for any practical purpose as people have said. A column and a-half of the *Times* is devoted to this attempt to bolster up a foolish proceeding which has been condemned since its completion even by those who could not see its absurdity in advance. Lord Grimthorpe, another almost invariable accompaniment of the silly season, will probably appear in due course.

## THE CAMBRIAN ARCHÆOLOGICAL ASSOCIATION AT HOLYWELL.\*

THE carriage excursion on the third day, Wednesday, the 20th inst., was in a westerly direction, starting as before at 9.30 a.m. from King's Head Hotel, at Holywell. The first point made for was Caerwys, fourth mile south-west of Holywell as the crow flies, but which has to be approached by a circuitous route, owing to intervening hills. Caerwys is believed to occupy the site of a Roman station, and the rectangular arrangement of the streets seems to favour this view. Nothing beyond the plan of the town was seen that would confirm the theory of its Roman origin. The church was the only object of interest which claimed attention. The ecclesiastical buildings seen on the previous day near Mold were of an English type; the one at Caerwys is distinctly Welsh. The plan consists of a nave and chancel of nearly the same width, with a tower and aisle on the north side, together extending the whole length of the church. The tower, which is at the north-west corner, is of a plain massive military pattern. The oldest portions, the pointed chancel arch, and a double-light cusped lancet window, are of the Early English period, but most of the west is of later date. There is a window with Decorated tracery in the south wall of the chancel at the east end, and two with Perpendicular tracery at the east ends of the chancel and north aisle. There are some nice fragments of old stained glass in these three windows, a small figure of an angel, censuring, coloured blue, yellow, and white, being particularly good. Between the nave and the north aisle, there is a single pointed arch, quite devoid of mouldings, like the chancel arch. The arcade, if it can be dignified by such a term, between the chancel and the north aisle is formed by two chamfered oak posts or pillars, with curved struts branching from the top to support a horizontal beam going across. The font is octagonal, poor in design, and dated 1661. In an arch recess with Decorated cusping, beneath a window on the south side of the chancel, is an effigy of a lady with the hands folded in prayer over the breast, carved in low relief, and much mutilated. On the exterior of the chancel, on the south side, is a remarkably well-cut inscription in Roman capitals to Robert Evans, of Cairwis (i.e., Caerwys), who died in 1582. The oak communion table has well-turned legs, and is dated 1620. Two curious old relics were exhibited in the church—(1) a small hand-bell used at funerals, and (2) a pewter flagon also used for drinking out of on similar occasions. Both relics are dated 1703. The communion plate has the date 1685.

From Caerwys the party proceeded to Newmarket, six miles to the north-west. Here the members left the carriages to climb on foot to the summit of Gop Hill, which is 820 ft. above sea level. A great archaeological treat was in store for every one, in the shape of an address by Prof. Boyd Dawkins upon the tumulus and bone cave on Gop Hill. On reaching the top a magnificent view of the surrounding country was to be seen, and of the sea coast from the Great Orme's Head on the west to Hilbre Island at the mouth of the Dee on the east, and even further to Liverpool in the extreme distance. The district immediately surrounding Gop Hill is an undulating upland of limestone formation, bounding the Vale of Clwyd on the east side, and overlying the Coal Measures, which run along the coast at a lower level. Gop Hill is not more than six or seven miles from Rhyl, and any one who may be staying at this fashionable seaside resort may be strongly recommended to make an expedition to this interesting spot. The tumulus is a huge mound of limestone rubble, and is a very prominent feature in the view for miles round. It reminded many of the members of the cairns they had seen in Brittany the previous year.

Professor Boyd Dawkins having collected the party round him on the top of the mound, proceeded to deliver the following address, as well as the rather high wind in the exposed position would allow him:—"Mr. President, Ladies, and Gentlemen,—The cairn on which we are now standing is one of the largest, if not the largest, pile of stones in the whole of Wales. I commenced its exploration in the year 1886, the owner, Mr. Pochin, having very generously defrayed all expense. We first sunk a vertical shaft from the top, as near the middle as we could guess, and then drove a horizontal drift

\* Concluded from p. 152, ante.



80 ft. long from the bottom of the pit. Every portion of the work had to be heavily timbered to prevent the sides falling in, which rendered the work both costly and tedious. The results obtained were few, as might have been expected from the small area we were able to explore by the method described. We were unlikely to have struck the true centre of the mound. It was extremely easy to miss it. At any rate we found nothing to reward our efforts beyond a few bones of the horse and other animals. With this meagre list of objects we were obliged to be content, and our work then came to an end, but I look forward to completing the thorough exploration of this most interesting tumulus in the near future. Perhaps some of you will ask why I have called it a cairn, that is to say an artificial heap of stones in contradistinction to a natural one. Well, I have referred to it as a cairn because any competent judge would at once see that it belongs to a type of ancient remains known to be sepulchral. I may mention a very similar tumulus, perhaps not of such large dimensions as the one now beneath our feet, which, on being opened, was found to contain a burial associated with a necklace of amber beads and the wonderfully beautiful golden corslet, now amongst the most highly-prized treasures of the British Museum. The tumulus on Gop Hill is sometimes called "Queen Boadicea's tomb," but there is no evidence, with which I am acquainted, that this celebrated ruler of the ancient Britons was ever in Wales. Nevertheless I believe that the tradition is true to the extent of indicating that the tumulus is the burial-place of some famous chieftain, but whether of the Age of Stone, or of Bronze, or of Iron, I am not now prepared to say. I hope, however, before many sessions of the Cambrian Archaeological Association are over that the question may be finally settled. The diameter of the mound is 350 ft. and the height 46 ft. Although its exploration has furnished so insignificant results up to the present, I must remind you of the sporting phrase that "very often in aiming at a crow you may shoot a pigeon." It was so in this instance as we shall shortly see." Prof. Boyd Dawkins at this point in his address requested his audience to accompany him a short way down the hill-side below the cairn, to a spot in front of the entrance to a cave in the limestone rock. A ledge of limestone projects over, forming a rock shelter on the left side of the cave. The learned Professor having pinned up a plan and section of the cave against a vertical rock continued his discourse. He said: "At the time that we were opening the tumulus, Mr. Pochin dug out a fox-run on the hill-side, and in doing so unearthed the entrance to the cave you now see in front of you. This we determined to examine. You will notice a large heap of debris in front of the cave. Through this we drove two horizontal passages or adits. We discovered large quantities of charcoal, bones and teeth of domestic animals, and pieces of rude pottery adorned with chevrons. Close against the rock, below the overhanging ledge of limestone, we found a large slab of limestone covering the bones of several human beings, and to the right of it a rectangular sepulchral chamber, about 4 ft. 6 in. square by 3 ft. 10 in. high, having its sides formed of dry rubble walling and containing an enormous quantity of human remains. It had evidently been a burial place used by a large number of individuals over a long period. We found no bronze implements of any kind, but the pottery taken out of the chamber is obviously of the kind manufactured during the Bronze Age. Three curious objects were associated with the burials, namely, two perforated pieces of jet and a polished flint flake. The skulls were chiefly long or dolichocephalic, such as we know to have belonged to the dark-haired aborigines of the Iberic stock that once were spread all over Europe, but some were of the round, or brachycephalic type which has been identified with the Celtic population. Thus we have here represented the two leading elements of the ethnology of Wales. Let us glance at the question of the coming of the Celtic people into Europe and into this country. The Aryans invaded Europe at a very early period, but we have no evidence of the appearance of the Celts in Britain before the commencement of the Bronze Age. The Continental Celt did not dare to attack the Aryan inhabitants of this country until he could do so with some prospect of success, such as the possession of a superior weapon

would be likely to ensure him. It was with a bronze spear in his hand that the Continental Celt marched to overcome his neolithic neighbour across the silver streak which has afforded us so good a defence though countless ages. There is important archaeological evidence derived from the formation of the bones found in this sepulchral chamber, that the individuals buried there did not wear boots with hard soles, but used their feet for grasping objects. I do not know whether there is any connexion between the cave and the tumulus. In the earth of the cave were discovered the bones of reindeer, rhinoceros, and other animals bearing the marks of having been gnawed by the hyenas, whose den it once was. At the bottom of all was a layer of clay without bones. There is evidence that the cave is of the post-glacial period."

Before leaving the neighbourhood of Gop Hill an inspection was made of Newmarket Church, which lies at its foot, an uninteresting building with a churchyard cross of the fourteenth or fifteenth century, having the crucifixion sculptured on both sides of the head. This cross, as well as others seen during the meeting, is described by the Rev. Elias Owen in his "Stone Crosses of the Vale of Clwyd." Mr. Owen formed one of the party on the occasion. The remaining places visited during the day on the return journey back towards Holywell, were Gwaenysgor Church (one mile north-west of Gop Hill), celebrated for its early registers, dating from 1538, where a fine Norman font, the best in this part of the country, was seen; Llanasa Church, well restored by the late Mr. G. E. Street, and having a quaint bell-gable, and some good old stained glass; and last, but not least, the splendid pre-Norman cross, called the Maen Achwyffan, which stands in a field one mile west of Whitford, quite apart from any church, and surrounded by a wooden railing. The Maen Achwyffan has often been illustrated from the time of Camden down to the present day. The best are those in Prof. I. O. Westwood's "Lapidarium Wallie" and in Lloyd Williams & Underwood's "Village Churches of Denbighshire."

At the evening meeting, papers were read by Mr. G. W. Shrubsole, Curator of the Chester Museum, on the "Course of the Roman Road from Deva to Varris," and by the Rev. Elias Owen on "Holy Wells." The latter contained many curious particulars as to the superstitious uses to which the Ffynon Elian was put as a cursing well. The method of cursing was to write the person's name on a pebble and drop it into the well. Ill-luck attended anyone after being "put into the well," and continued until after the pebble which represented him was removed.

The third day (Thursday, the 21st inst.) was devoted to Flint and Chester. Leaving Holywell railway station at 9.8 a.m. the members arrived at Flint at 9.15 where they were met by Mr. Henry Taylor, F.S.A., the Deputy Constable, and conducted over the Castle and Town Hall. Flint does not give the idea of being an attractive place, as seen from the railway, owing to the proximity of chemical works, but it improves on further acquaintance. Mr. Taylor has published an excellent little guide-book to the Castle, containing an illustration by the late Randolph Caldecott of the memorable scene, described by Froissart, in which the unfortunate King Richard II. is deserted by his greyhound Mahe the day before he was conveyed with the Earl of Salisbury to Chester, by order of Bolingbroke, on "two little nagges, not worth 40 frankes." Flint Castle is situated on the sea-shore, and is well worth a visit, notwithstanding the forbidding aspect of the red-brick building between it and the town, formerly used as the county prison. The plan consists of a square area with a round tower at each corner and a curtain wall between. The tower at the south angle, which formed the keep, is detached, and of much greater size than the other three. It has vaulted galleries in the thickness of the wall running right round. The whole building is remarkably well constructed of yellow sandstone.

After the Castle had been thoroughly examined a move was made for the Town Hall. Mr. Henry Taylor here pointed out the various improvements he had effected in the decorations of the Council Chamber, in order to make it worthy of the ancient borough of Flint. The painted ceiling is divided into fifteen panels, containing the armorial bearings of the royal tribes of North Wales. Arranged round the walls are various pictures and other objects

connected with the history of Flint. Amongst these are copies by the talented young Flintshire artist, Mr. Leonard Hughes, of the portrait of Richard II. in Westminster Abbey, and of Colonel Roger Mostyn, the gallant defender of the Castle in 1643; a rubbing of the brass in Cobham Church, Kent, of Sir Nicholas Hauberk, Constable of the Castle 1396-1399; a water-colour painting of Edward the Black Prince; a case of seals relating to Flint; and Speede's map of the county of Flint. On the table in the Council Chamber were displayed the Corporation and Church plate.

The members having seen Flint, left for Chester by the 10.30 train. On arrival at the station they were joined by a party of the Chester Archaeological Society, and at once proceeded to St. John's Church, where, in the absence of the Rev. S. Cooper Scott, they were received by the Rev. G. Child. This church is so well known that it will be unnecessary to describe it at length, but it may be mentioned that considerable interest was excited by the pre-Norman headstones preserved in the crypt, together with many other well-executed pieces of later sculpture. The crypt was very dark, so that the stones were not seen to advantage. It would be well to remove the Saxon stones to the Grosvenor Museum.

From St. John's Church the members went on to the Cathedral, where the Rev. Canon Blencowe undertook the office of guide. After luncheon, hospitably provided by the Mayor, at the Town Hall, the charters and regalia were exhibited, preparatory to making a perambulation of the town walls, under the able guidance of Alderman Charles Brown. The day's proceedings terminated with a visit to the Grosvenor Museum, where the Curator, Mr. G. W. Shrubsole, explained the various antiquities preserved there. On the side of a Roman pig of lead of the date A.D. 74, found near the Roodeye, is the word DECEANG, which some of the authorities present believed to be identical with the more modern name of the district of Tegenel. The inscription has been previously read in two words as DE CBANGI. It will be unnecessary to describe the wonderful series of inscribed stones recently found built into the town walls. As Welsh archaeologists the members were particularly interested in the fine sepulchral urns of the Bronze Age obtained from Mr. Darbishire's quarry at Penmaenmawr. Inside one of the urns was found a boat-shaped stone cup, which has been pronounced by the best authorities to be unique. The Grosvenor Museum is far too small for its purpose, and the cases containing art objects, lent by the South Kensington Museum, are quite out of place in such a collection.

The last day of the meeting (Friday, the 22nd inst.), was also the finest, so that there was no necessity for the use of a cloak like the one described in the life of St. Winefrid. Every year on the vigil of St. John the Baptist, St. Winefrid sent a cloak to St. Beuno by placing it on a stone in the fountain, when it was immediately conveyed to him floating down the stream on the stone. "The virtue of this cloak, on account of the merit of the virgin, was such, that whosoever Beuno might be clothed therewith, it neither got wet with rain, nor was its nap turned by the wind. From the event of such thing Beuno called the coat "Siccus." There is a stone still to be seen beneath the water of St. Winefrid's Well, which is called "St. Beuno's Stone." This is no doubt the one that formerly was credited with such miraculous properties.

Starting at 9.30 a.m., some of the party went to see a portion of Watt's Dyke, situated just outside the town of Holywell, on the north-east side, but the majority made straight for the church and St. Winefrid's Well, which lies close to it. Watt's Dyke is an earthenwork of the same description as Offa's Dyke. Nothing is known of its history. Its course is marked on the Ordnance map, running in a south-easterly direction between Northop and Mold, nearly parallel with the shore of the estuary of the Dee, at a distance of from three to six miles from it, and then turning south at Hope towards Wrexham and Oswestry. Offa's Dyke runs parallel with Watt's Dyke, the latter being to the east of the former, and consequently further away from the foot of the Welsh mountains and nearer England.

Holywell Church possesses hardly any interest for the antiquary. There are some tablets with inscriptions to the memory of members of the Mostyn and Pennant families in the interior, and a mutilated effigy of a priest with a



maniple, holding a chalice against his breast. Adjoining the churchyard, and upon the same level with it, is the chapel above St. Winefrid's well, a building in the Perpendicular style, having a frieze of sculptured beasts forming a moulding running round the whole, similar to that already noticed at Mold Church. The well lies immediately beneath the chapel, the floor of the latter being supported by the vaulted ceiling of the former. The well is approached by a flight of steps from the road. Camden says of it:—"Under this place I viewed Holywell, a small town where there is a well much celebrated for the memory of Winefrid, a Christian virgin, ravished here and beheaded by a tyrant; also for the moss it yields very sweet odour. Out of this well a small brook flows (or rather breaks through the stones, on which are seen I know not what kind of red spots), and runs with such violent course that immediately it is able to turn a mill." Nothing is more astonishing than to see the enormous volume of water which rushes out from the stream, and the clacking of the wheel of the mill which Camden speaks of is still to be heard. It is not more than twenty yards from the spring. It is hardly necessary here to repeat all the legends connected with St. Winefrid. Those who are interested in the subject may consult Rees's "Cambro British Saints," or Bishop Fleetwood's "Life and Miracles of St. Winefred." The life of the saint is said to have been written by the contemporary monk Elerius, but the earliest authentic account is that given in the twelfth century by Robert, Prior of Shrewsbury. Ralph Higden, in his "Polychronicon," has a curious Latin poem about St. Winefrid, in which he tells us that the descendants of Caradoc, who beheaded St. Winefrid, were condemned to bark like dogs, until they came to bathe in the well:—

"Qui scelus hoc putaverat  
Ac nati et nepotuli  
Litrant ut canum catuli  
Dunce Sanctus suffragium  
Pescant ad hoc fonticulum  
Vel ad urbem Salopia  
Ubi quiescit hodie."

The well is rented by the Roman Catholics, and large numbers of pilgrims annually visit the place that they may take advantage of the reputed miraculous properties of the waters in order to be cured of various diseases. Suspended from different parts of the roof and walls of the well are to be seen many *ex voto* offerings of crutches, &c., left by grateful persons who have been healed at the well. The feast of St. Winefrid is on November 3. The structure over the well is a very beautiful specimen of Perpendicular architecture, erected by Margaret, Countess of Richmond, the mother of Henry VII., to whose generosity we also owe the churches of Mold and of Northop. A plan of the well is given in the *Archæological Journal* (vol. iii., p. 148), and general views will be found in Pennant's "Tours in Wales." The shape of the basin of the well is an eight-pointed star, having angles of 90 and 135 degrees. Vertical mullions or pillars rise from each corner of the star to support the vaulted roof, and the spaces between were originally filled in with tracery (now gone), which screened the well off from the passage running round it. The chamber in which the well is enclosed is square, having no openings in the walls except in the front, which is pierced by three low-pointed arches, and a door in one of the side walls. There are flights of steps within the chamber on each side of the basin of the well in front leading down to the bottom. The bosses of the vaulting are ornamented with the arms of the Stanley family, Catherine of Aragon, and others. There is a very large cylindrical pendant boss over the centre of the well, covered with elaborate sculpture. Outside the well is a large bath open to the air. Under the water, at one corner, is St. Beuno's stone, already mentioned.

Leaving St. Winefrid's Well and its Medieval associations with much regret, a drive of a mile down the road along the west side of the gorge formed by the stream which issues from the well, brought the party to Basingwerk Abbey. The ruins are situated on rising ground on the east side of the entrance to the valley, about a quarter of a mile south of the Holywell railway station. Papers on Basingwerk have been published in the *Archæologia Cambrensis* (vol. i., p. 37) and in the *Journal of the British Archaeological Association* (vol. 34, p. 468) by Mr. E. P. Loftus Brock. Buck's "Views" (vol. 2, p. 389) may be referred to as showing how much of the ruin has been

destroyed during the present century. Giraldus Cambrensis lodged a night at Basingwerk (A.D. 1188) when in the train of Archbishop Baldwin on his progress through Wales to preach the Crusade. He calls it "Cellula de Basingwerk," which does not seem to favour the idea that there was a large monastery there at that time. Ranulph, second Earl of Chester (A.D. 1131), was one of the greatest benefactors to the abbey, and possibly its founder. The style of the architecture of what now remains of the abbey is very late Transitional Norman or Early English. The north side of the nave, the north transept, and the choir are completely gone, although their position might be ascertained, no doubt, by excavation. The west wall of the nave is standing to a height of 8 ft., and the south wall to a height of 2 ft. 6 in. The west and south walls of the south transept are complete, and the triple lancet window in the south gable is the most prominent feature in all the views of the abbey. The pointed arch leading from the south aisle of the nave into the south transept is still perfect. The width of the aisle may be fixed by the respond of the nave arcade. The springing of the arches of the central tower can be seen at the top of the south-west pier, the only one now standing. To the south of the south transept are the ruins of a long range of buildings on the east side of the site of the cloisters. The east walls are the most perfect. When Buck's view was taken the west walls also were in existence. The lower story was occupied by the sacristy, chapter-house, library, &c., and the upper story, the holes for the floor beams and rows of lancet windows of which are not yet destroyed) was used as the monks' dormitory. Part of the chapter-house forms a chamber lighted by lancet windows adjoining the east side of the range of buildings and entered from it through two round arches springing from a pillar in the centre of the opening. On the south side of the site of the cloisters is the refectory, which is perfect, with the exception of the roof, and contains some good Early English architectural details. One good result of the visit of the Cambrian Archaeological Association to Holywell will be that there is a chance of the ruins of Basingwerk Abbey being systematically excavated. Mr. T. Vaughan Hughes has commenced to dig some trenches on the site of the north transept, and has discovered several encaustic tiles. Mr. Hughes has, unfortunately, no special knowledge as to how such a work should be undertaken, but he has promised that he will do nothing further without advice from some competent authority. It would be better to leave the thing altogether untouched than to do it badly.

The next place visited was Downing, formerly the residence of Thomas Pennant, the great Welsh antiquary, which is situated about three miles west of Holywell railway-station. The house was built in 1627, and afterwards altered by Thomas Pennant, who was born in the yellow room on June 14, 1726. He was enabled to spend money on improvements owing to the fortunate discovery of a valuable lead mine on his estates. Thomas Pennant's branch of the family came from Byclon, which lies midway between Downing and Mostyn Hall. A full description of Downing and its contents will be found in Pennant's "History of the Parishes of Whiteford and Holywell." The members were allowed to see the interior of Downing House, through the courtesy of the Earl of Denbigh. Afterwards an inscription was made of an inscribed stone which was brought from Caerwys, and is now erected in the garden close to a small artificial lake below the house. It is a rude whinstone boulder, 3 ft. 9 in. high by 3 ft. wide by 1 ft. 6 in. thick, inscribed in debased Latin capitals of the sixth or seventh century.

HIC IACIT MVLI  
ER BONA NOBILI

["Here lies a good and noble wife"; or, according to Professor Rhys, "Here lies the good wife of Nobilis."]

THE M of MVLIER is the only letter of the minuscule form, indicating a transition from the Roman capitals to the Hiberno-Saxon minuscule.

From Downing the members went on to Mostyn Hall, where they were received by Lord Mostyn, the President of the Meeting, and conducted over the house and grounds in batches of twenty under his lordship's able guidance. Afterwards they were most hospitably entertained to luncheon. We must here record the fact that by some mismanagement a large

number of non-members were allowed to join this day's excursion with the sole object of getting a free lunch. It is unfair to overtax the hospitality of persons who are kind enough to throw open their houses to archaeologists by bringing double the number of guests that is expected; and on this particular occasion the working members of the Association were prevented from seeing the house, whilst complete outsiders were busy eating and drinking. It is high time that the plan adopted by the Royal Archaeological Institute of declining all offers of hospitality should be followed by other societies.

The most interesting objects at Mostyn Hall are a splendid gold torque found at Hatfield Castle in 1692; a Roman cake of copper weighing 42 lb., inscribed—

SOTO ROMAE

and

NATSOL

The silver harp used at the Caerwys Eisteddfod in 1868 was shown; and Lord Mostyn also exhibited (under a glass case) a selection of his valuable collection of Welsh MSS., for the inspection of members. His lordship will not, however, allow anyone to examine his MSS. for purposes of research, and has repeatedly put difficulties in the way of experts who were anxious to do so.

On the return journey to Holywell visits were paid to the so-called Roman "pharos," illustrated by Pennant, which turned out to be the ruins of a comparatively modern windmill; and Whitford Church, where there are a few fragments of early sepulchral slabs and a sundial with a Welsh inscription.

The papers read at the evening meetings, with the exception of one or two, were not such as would be likely to attract a general audience, however suitable they may be for publication in an archaeological journal. A complaint of the dullness of the papers was formally made by a member at the meeting on Friday evening. He said he was glad to notice the author of paper No. 1 was ymyning and showing visible signs of being bored whilst the author of paper No. 2 was trying the patience of his audience.

## Illustrations.

### THE PUBLIC FOUNTAINS OF PARIS.

THE illustrations of these fountains, reproduced from photographs, are published to accompany and illustrate a full article on this curious and interesting subject, which will be found on another page, and in which the few fountains here illustrated are further described and the names of their designers given, so far as they are known. As is pointed out in our article, the numerous works of this type in Paris form an important series of links with the architectural history of old Paris; and on many of them the talent of some of the first architects and sculptors of their day was employed.

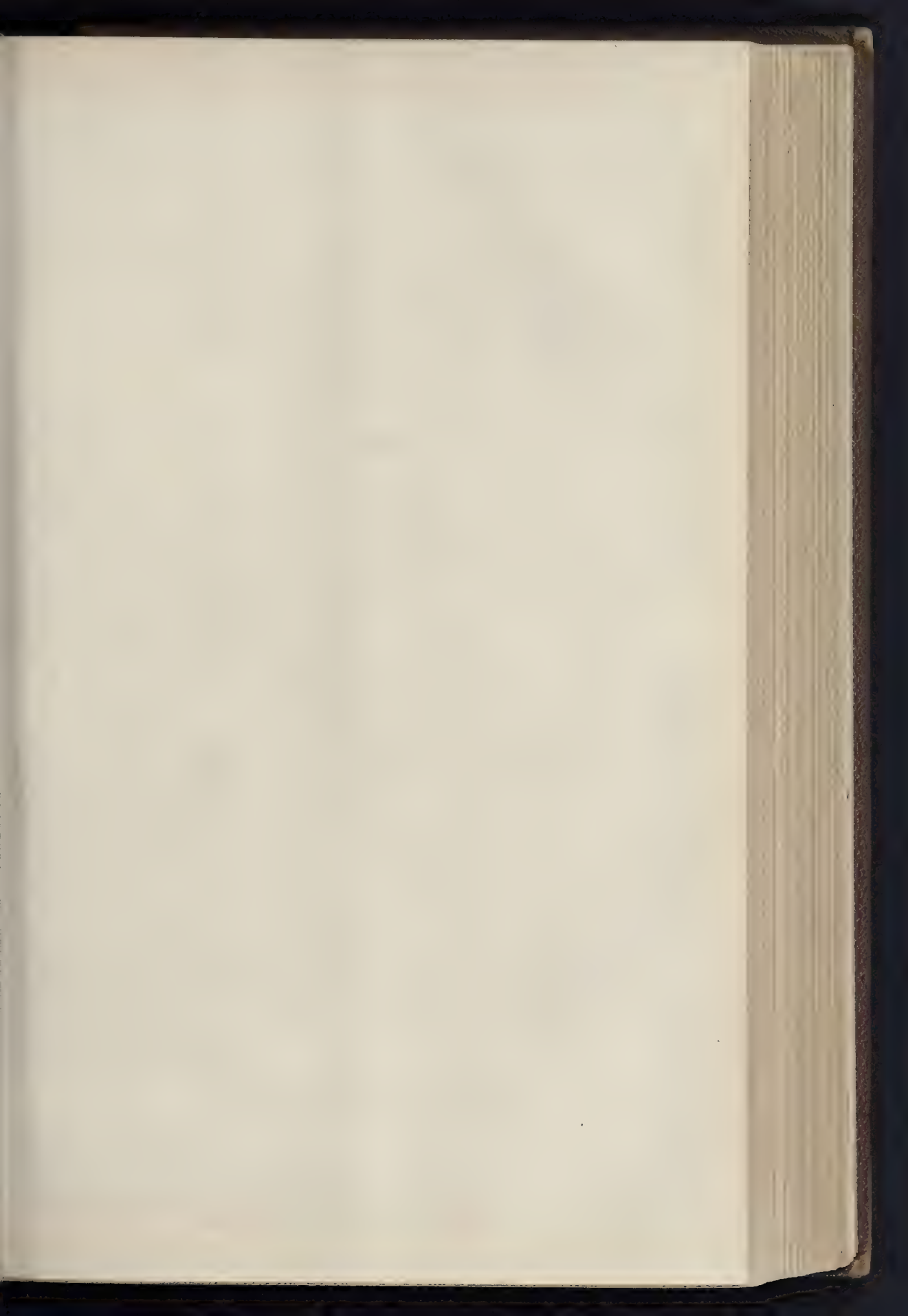
### ORTHOGRAPHIC PROPORTIONS OF THE PARTHENON.

THE diagrams which occupy four of our lithographic plates are published to accompany an important essay by Mr. Watkins Lloyd on the subject of the proportions of the Parthenon, and inferentially of Greek temples generally, the first half of which is published in the present number of the *Builder*. The objects of the diagrams, and the assumed system of proportion which they illustrate, are fully explained in Mr. Lloyd's paper, which must be taken in connexion with the plates.

The second portion of the paper, for the elucidation of which these diagrams are also requisite, will be given in our next issue,—the whole being too long for publication in one number.

NEW FREE CHURCH, MOFFAT, N.B.—The foundation-stone of this building was laid on the 19th inst. Competitive plans were submitted in March last, and those of Mr. D. B. Burnie, architect, Edinburgh, were approved of. The style of architecture is Early English Gothic. The church is to be built of whinstone from Moffat Well Quarry, with dressed red freestone facings from Cornockle Quarry. It will contain 760 sittings, with ample hall accommodation and vestry, and the height of the spire will be 123 ft. The total estimated cost is £4,200.







FONTAINE DE MARS



F





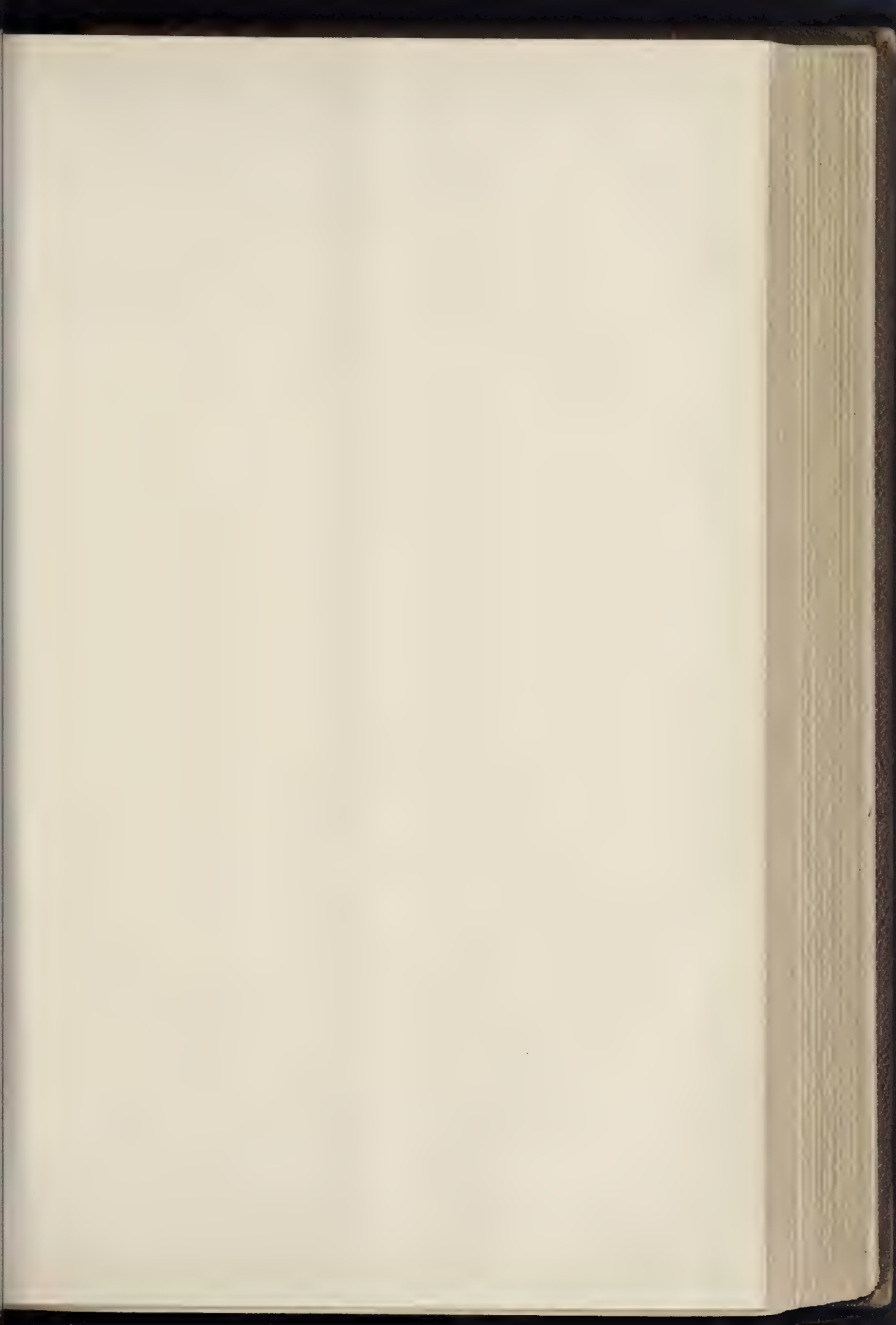
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FONTAINE DE L'ECHAUDÉ

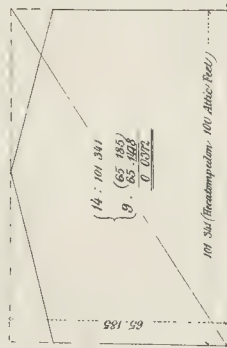




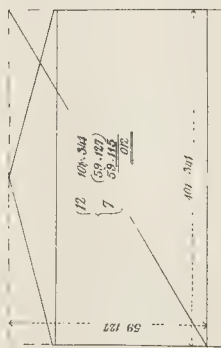


*Note.* The dimensions which are underlined are calculated as 65.1429 are the calculated or approximate ones the remainder are actual measurements

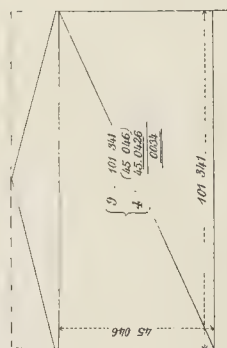
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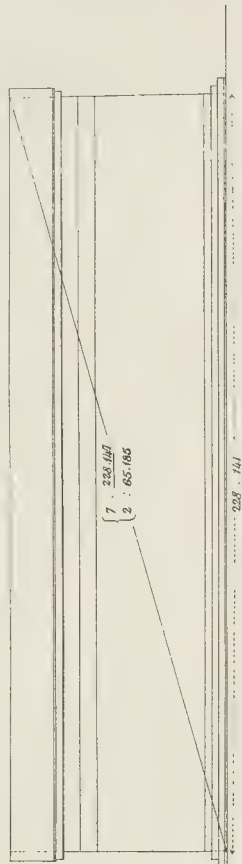


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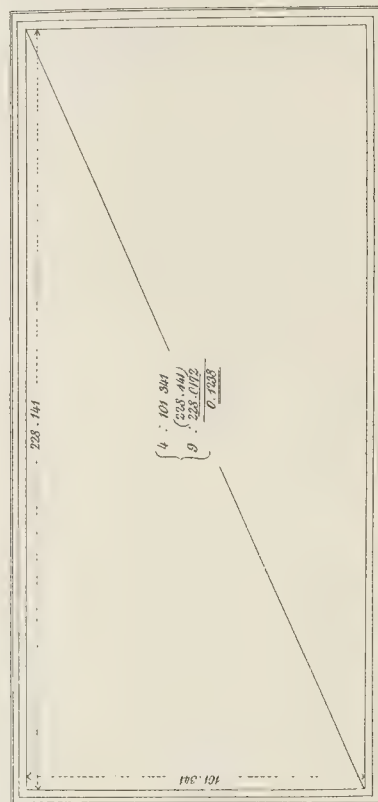
End Elevations

Nº 2.



Side Elevation

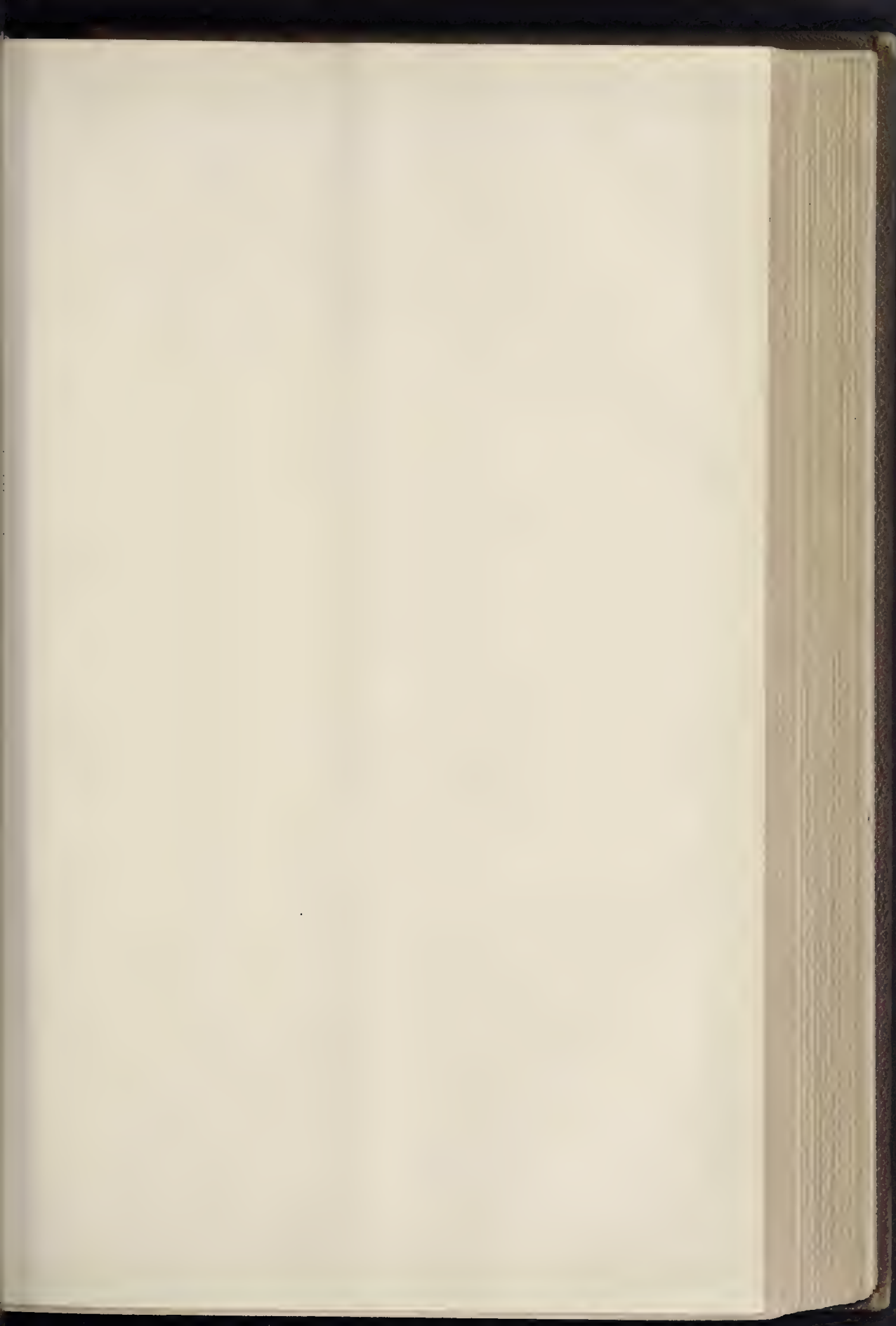
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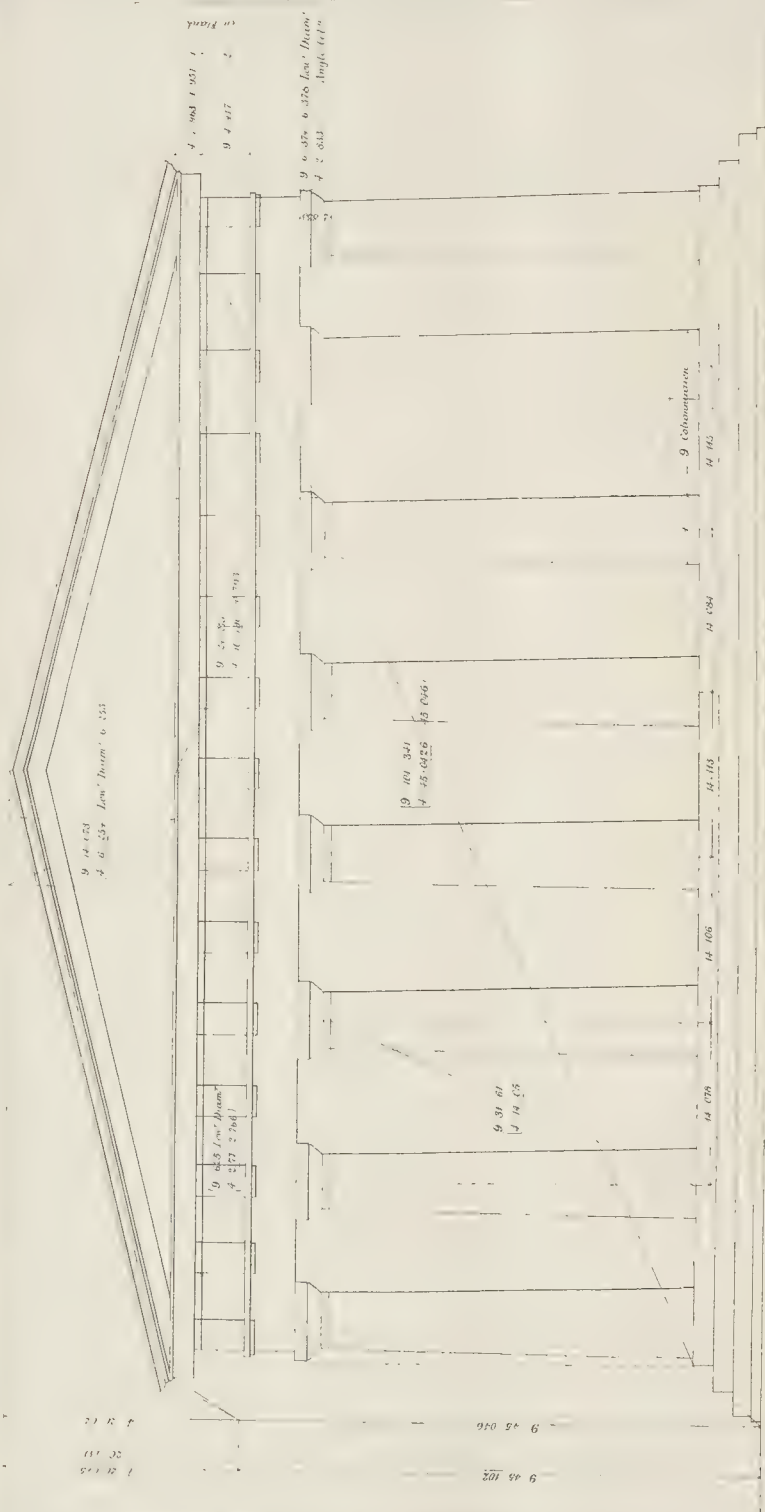
PARTHENON. Plan.

Applications of Rules having difference between their terms of 5 to finding outlines of Plan and Elevations.





THE BULDER AUGUST 30, 1950

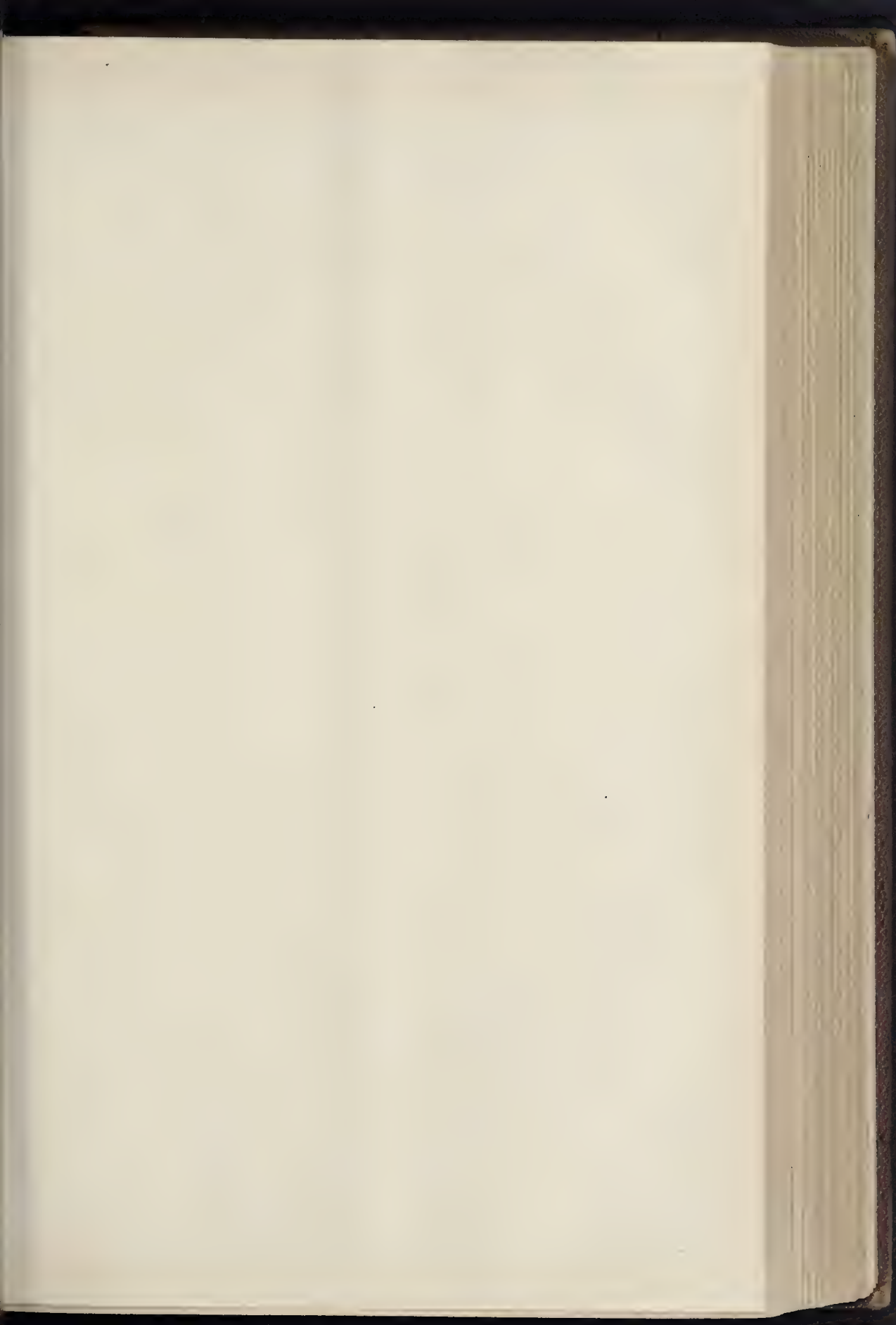


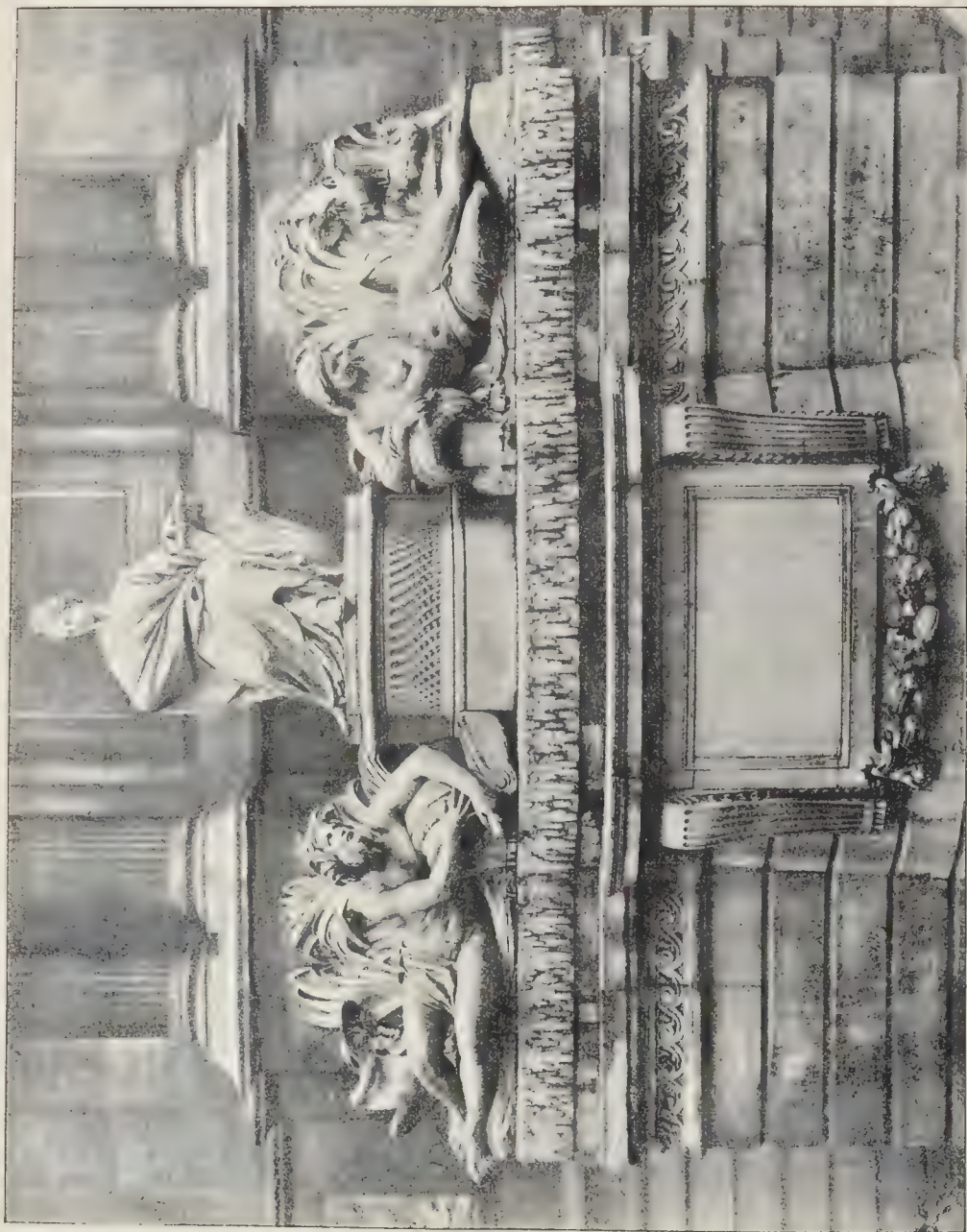
# PARTHENON.

Ratio 4 : 9 applied to Elevation of Front.













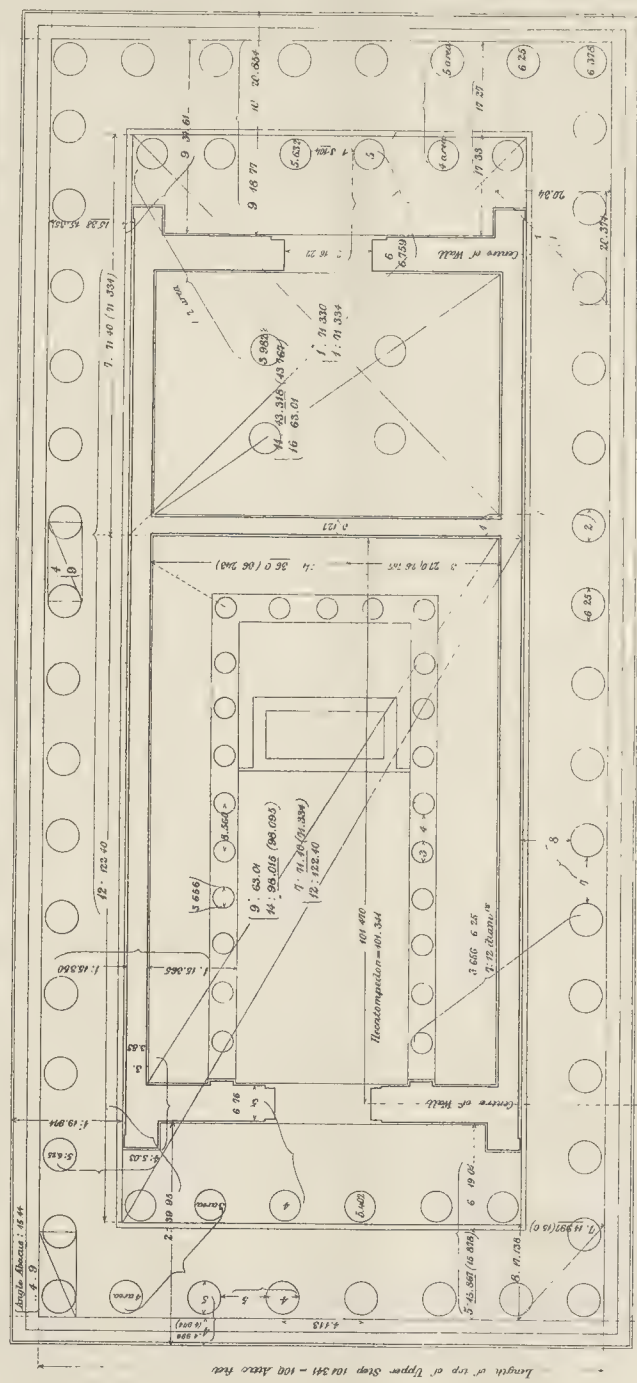
THE PUBLIC FOUNTAINS OF PARIS.  
FONTAINE DE LA PAIX





Note: The dimensions, which are underlined, as 71.40, are the calculated or approximate, and the remainder are measured.

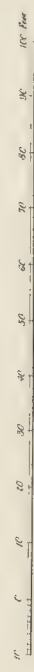
9 228 144



Length of top of Upper Step 228 144

1 76.049 (19.37) 2 132.094 (33.37)

# PARTHENON

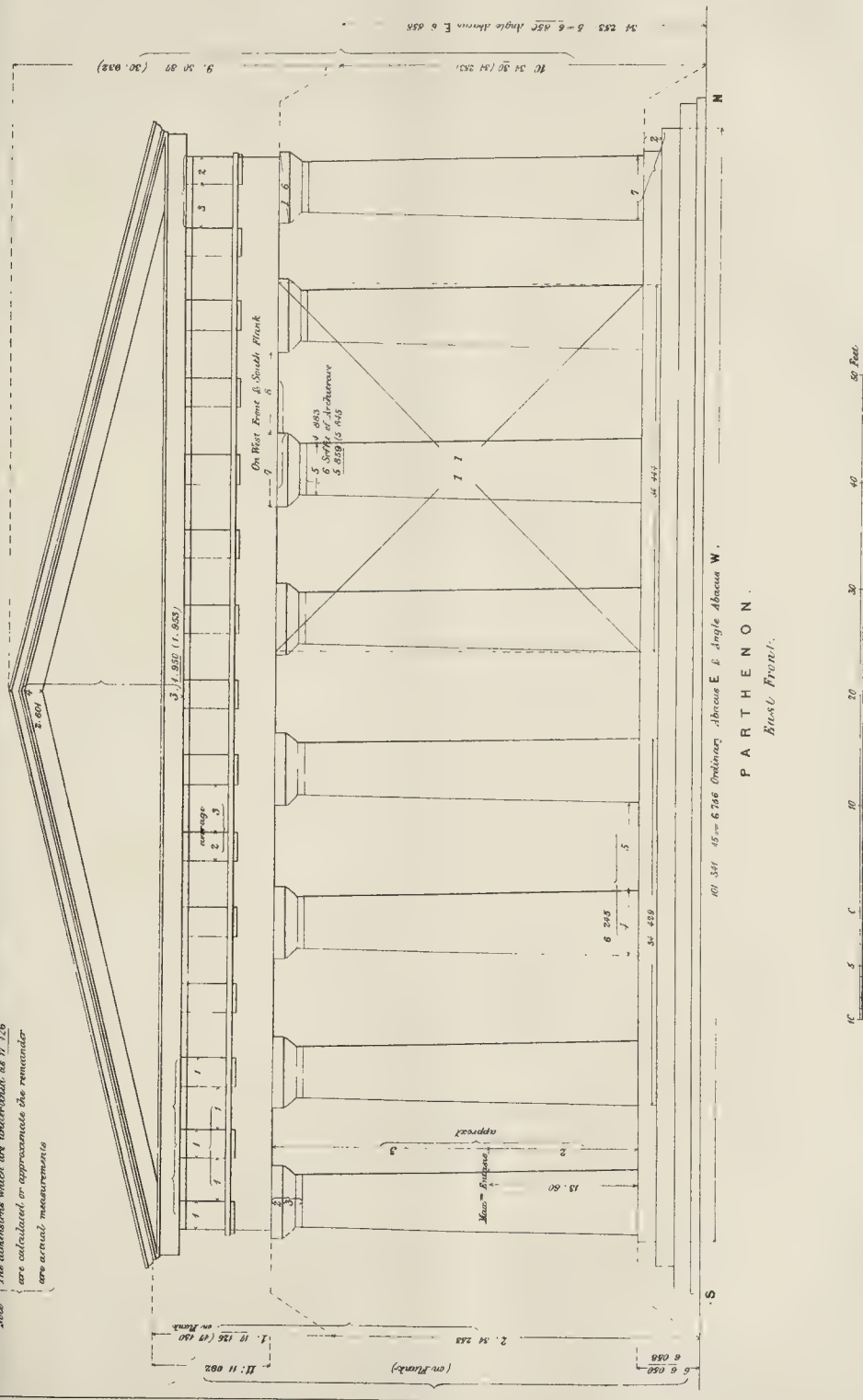


THE PROPORTIONS OF THE PARTHENON. DIAGRAMS IN ILLUSTRATION OF MR. WATKISS' LLOYD'S PAPER





Note: The dimensions which are underlined as 17 126 are calculated or approximate the remainder are actual measurements



P. 1. 331 15 = 6.746 Ordinary Abacus E & Single Abacus W.  
PARthenon.  
East Front.

THE PROPORTIONS OF THE PARTHENON: DIAGRAMS IN ILLUSTRATION OF MR. WATKISS LLOYD'S PAPER





**SANITARY CONGRESS AND EXHIBITION AT BRIGHTON.**

THE Sanitary Institute is holding its twelfth Autumn Congress at Brighton this week. The proceedings were formally commenced by the reception of the members by the Mayor (Mr. Alderman G. Manwaring, J.P.) at the Pavilion. Shortly afterwards, the Mayor presided at a public luncheon, and in proposing the toast of "The Institute," he very aptly said that sanitation meant something more than perfect trains: it included proper food, clothing, dwellings, and rational recreation. Sir Douglas Galton briefly replied on behalf of the Institute, and two or three other toasts followed. In the afternoon the Mayor formally opened the Health Exhibition, of which we give some account in succeeding columns.

The first general meeting of the Congress was held in the Music Room of the Pavilion, on Monday evening. Sir Douglas Galton, as Chairman of the Council, took the chair, in the unavoidable absence of Mr. G. W. Hastings, M.P., the President of last year's Congress, held at Worcester. In introducing the President of the Congress to the meeting, he said that Sir Thomas Crawford, after devoting between forty and fifty years to the service of the Queen in all parts of the world, had, since his return to this country, held the appointment of Director-General of the Army Medical Department, in which capacity he had done much good service.

*The President's Address.*

Sir Thomas Crawford, K.C.B., M.D., then took the chair, and proceeded to deliver his Presidential address. He commenced by saying that the formation of a national Society having for its main object the advancement of all subjects bearing upon the public health was a philanthropic conception which found expression in the inauguration of the Sanitary Institute of Great Britain in 1874. That Society had now been amalgamated with a kindred association [the Parkes Museum], founded in honour of that great apostle of practical hygiene, the late Professor Parkes. The Sanitary Institute, thus constituted, had extended its sphere of usefulness, without curtailing in any way the objects for which these allied institutions were originally founded. One of the chief objects was, and still is, the holding of meetings and exhibitions like the present, in such populous and influential centres as might be moved, in the interests of the public, to offer the Institute facilities for the purpose. Having thanked the Mayor and Corporation of Brighton for their hospitable invitation, and for the very liberal provision which had been made for the accommodation of every branch of the Congress, in inaugurating the Health Exhibition, the President said:—"My next words must be couched in terms of regret for the loss of one who has long held a prominent position among the officers of the Institute, of which he was an esteemed Vice-President. I need hardly say I allude to Sir Edwin Chadwick, whose recent death leaves a blank in the roll of worthies whom philanthropists in general, and sanitarians in particular, delighted to honour. Robust of frame, resolute of purpose, quick to perceive the irresistible logic of facts, and indefatigable in collecting such as throw light on the health condition of the wage-earning classes in particular, he exercised a powerful influence for good over the social and sanitary legislation of the past half-century. It was mainly through his action that Lord Lyndhurst was induced to support and carry through Parliament an Act authorising the establishment of the Registrar-General's office, from which has since issued a mass of carefully-prepared vital statistics which are invaluable. We are also largely indebted to him for those earlier Royal Commissions, which have contributed so materially to improve the sanitary condition of our public services. Sir Edwin Chadwick was spared to exceed by many years the proverbial three score years and ten, and to the last he retained a freshness and vigour of intellect as much above the average as was his length of days." In the course of the next portion of his address the President alluded to the possible great power for good which could be exerted by the clergy in the cause of sanitation. The clergy of all denominations, he said, were indefatigable in their endeavours to save men's souls, and with that object in view, they were zealous at all times in enforcing the due observance of the moral law; but it had often occurred to him that all that important work would be materially advanced if coupled in a larger

measure with equally zealous efforts for the enforcement of those physical laws the violations of which were, in many instances, the direct cause of the needless and wasteful suffering and misery, premature decay, and early death entailed by preventable disease. The clergy as a body did undoubtedly take an active interest in the physical as well as the spiritual condition of the people, but if one might judge from the polluted atmosphere which too often pervaded the places set apart for religious assemblies, they were not sufficiently equipped with that sanitary knowledge which was so essential for those who undertook to guide the people in such matters. It was for that reason they hailed with special satisfaction such sermons as that delivered by the Dean of York, on the occasion of their visit to that city in 1886; and still later by Canon Creighton, before the Congress at Worcester, in 1889. He could not pass on without quoting two sentences from the admirable address of the latter: "It is hard," says the Canon, "for those who live with enfeebled frames, amid neglected and filthy surroundings, to feel strong aspirations after the beauty, the purity, and the truth of a spiritual life." The conditions under which life is lived—the unwholesome air of the factory, the crowded room, the ill-ventilated chamber, all these rob the body of its vigor; how must they react on the soul? You heard in the epistle this morning of the works of the flesh—uncleanness, hatred, variance, drunkenness, revellings; do not these things, think you, come very largely from, and are they not very largely affected by, the physical conditions with which life is lived? These sermons and the kindred address recently delivered by the Archbishop of Canterbury before the British Medical Association at Birmingham, made them hope that in the near future the clergy would rival the medical profession in their pursuit of that knowledge, by means of which the suffering and misery entailed upon the people by preventable disease could alone be effectually met; and that, with that end in view, they would enroll themselves in large numbers as members of the Sanitary Institute. The laws which governed the origin and spread of preventable disease were not merely physical, as some scientists were apt to assume, nor were they merely moral laws, the violation of which entailed those terrible consequences to which Canon Creighton alluded. They were both. There was a moral as well as a physical code which must be observed if men were to realise all that might reasonably be hoped for in Preventive Medicine. The chief point to which he wished to call attention was the wastefulness of ignorance in regard to sanitation in general, and domestic hygiene in particular; and the ample financial returns which all might realise by grappling vigorously with the whole question of disease prevention, the practicability of which the Sanitary Institute was yearly endeavouring to bring home more clearly to the masses of the people. Of the excellent work done in that direction, the development of these annual congresses was perhaps the most practical. They demonstrated the importance of sound sanitary principles in every detail of domestic life. The papers read at these meetings, and published in the "Transactions," and the valuable body of vital statistics and health reports compiled from the writings of Dr. Farr and Sir John Simon, and now made easily accessible to the public by the Sanitary Institute, were efforts in this direction of which any society might be proud. And yet they were still at a loss for reliable data on which to base accurate calculations of the suffering and loss entailed upon the people by preventable disease. The facts as to mortality had been carefully noted, and tabulated with great advantage to the public, but the facts regarding sickness, apart from mortality, were only approximately known. It was in that direction that the labours of the Medical Officers of the Army had proved of value to sanitary science, and it was to the results of these labours, as set forth in the reports of the Medical Department, that he wished to direct attention. The President then went at some length into this question, and quoted statistics the upshot of which was that in the Army the loss to the nation from sickness represented a money value alone of more than half a million of money. Applying the same principle of classification which prevailed in the Army to men of similar ages, and subject to similar influences and disease factors in civil life, it was possible to make a tolerably accu-

rate estimate of the actual loss of money entailed upon the wage-earning classes by preventable disease. True, we had no trustworthy record of sickness among civilians, nor was it likely that we would ever be able to apply the numerical methods, so valuable in the study of vital statistics, to such attacks terminating in recovery. Something was done in that direction by benefit societies, sick clubs, and other labour organisations; and much more might be done with advantage by the great companies and large employers of labour. The coming International Congress of Hygiene and Demography, which included the study of the life conditions of communities from a statistical point of view, would, it was hoped, throw much light on this important point. Meantime, and till some such record was available, we must be satisfied with such approximation to truth as we might be able to obtain. Sir James Paget delivered an address at the Health Exhibition in 1884, in which he established, on reasonably conclusive evidence, that the loss from sickness, between the ages of fifteen and sixty-five, in England and Wales, amounted to about 20,000,000 weeks' work in the year, or about one-fortieth part of the work done in the year by the whole population between those ages. Rather more than half that loss fell upon those whom the Registrar-General described as the domestic, agricultural, and industrial classes. Valuing these lost services as equal, on an average, to 11. per individual per week, the amount at which the soldier's services had been valued, the loss to the annual wealth of the country from sickness among these classes alone amounts to 11,000,000. sterling. Of the other classes, who lost the remaining 9,000,000 weeks' work, it would be hard, Sir James added, to make a guess in any known coin; for these included our great merchants, judges, lawyers, clergy, medical men, statesmen, legislators, poets, writers, musicians, painters, philosophers, and princes, who certainly did more for the wealth and welfare of the country than could be told in money. These estimates did not include the still greater loss indicated upon the people by the premature death of our most industrious bread-winners, at an age, too, when they were most productive; nor did they touch the cost of subsistence and nursing, and other sources of expenditure which sprang out of sickness; or the sorrow and suffering of the widow and orphan left desolate by such bereavements. Sir Edwin Chadwick considered Sir James Paget's estimate of loss too low by many millions, and that the burden of taxation arising from that cause was three times greater than the poor rate. "In London this burden, from preventable disease, was £700,000 a year at a very moderate estimate."

The President then proceeded to discuss the various theories of disease-producing organisms, and said that bearing in mind the saprophagous character of some at least of these organisms, there was presumptive evidence in favour of the views held by some that, after all, these microbes were in the main scavengers, and that it was only when the healthy human frame had been in some way weakened that they were able to find a lodgment in it. But however that may be, it was obvious that the removal and destruction of all decaying organic matter was clearly indicated. Starve the microbe and save the man. In one particular that important principle was too often neglected: he alluded to the present system of dealing with house refuse, which was in many instances a convenient and attractive nidus for such organisms, and an effective vehicle for their spread. Dr. Louis Parkes had dealt so admirably with that subject in his excellent manual—"Hygiene and Public Health," the second edition of which had just been issued, that he could not do better than refer his hearers to it for further particulars. Dr. Parkes truly said, "The best method of getting rid of dustbin refuse is to burn it," and he gave a description of a destructor furnace which seemed to be well suited for the purpose. The Jews, more advanced in sanitary precautions than most nations, were well aware of the purifying power of fire. Would that we, too, had a *gehenna* in every locality in which people were permitted to shoot rubbish! There would be fewer complaints regarding the foulness of the subsoil or the "made" ground on which the modern "jerry builder" was permitted to erect his speculative blocks of artisans' dwellings. Having referred to the necessity of good laundry accommodation, the President said that of all



the causes which contributed to the origin and spread of preventable disease, overcrowding was, perhaps, the most important. That evil was met with in its most mischievous forms in large centres of human industry, where, for want of space, buildings were crowded together, and carried up to undue elevations; and where the prospects of employment at high wages attracted numbers of the working classes greatly in excess of the available accommodation. Nothing short of prohibitive legislation would check this. Every human habitation, whatever its height, should have open spaces in front and rear, commensurate with such elevation, so as to secure a free and adequate supply of both air and light to every part of the building; and the number of persons inhabiting such dwellings, or congregating in places of public assembly, should also be limited to that for which its aerial capacity is pronounced by competent authority to be adequate. Another indispensable requisite was a full and continuous supply of fresh potable water of good quality. Unfortunately the rapid and progressive increase of population in our large towns, and the wasteful prodigality of past generations in the matter of water conservancy, had surrounded this question of a full, free, and wholesome water supply with many difficulties. Still these were not insuperable; and till they were overcome we must not rest, nor admit that we were satisfied. Our sanitary engineers and Medical Officers of Health were thoroughly alive to the urgency of our needs in that direction, and we had confidence in their ability and readiness to do all that was necessary as soon as they were clothed with the requisite powers, and provided with the means. For the first we must look to the Legislature; for the second to the liberality of the nation. In conclusion, turning again to the reports on the health of the Army, we found that the rate of mortality among the European troops stationed in India during the half century prior to the date of the Report of the Royal Commission, was, in round numbers, 60 per 1,000; and in the Army at home, about 17 per 1,000. Since then, thanks to the wise policy pursued both in India and at home, the death-rate in the Army had been a steadily decreasing quantity. According to the report for 1888, the death-rate in all India was 15.20 per 1,000, and at home 5.52 per 1,000. He was not able to refer to the statistics of sickness among the troops serving in India prior to 1859; but were these accessible, he had no doubt they would show a corresponding diminution of the non-effective rate from sickness. In that instance there could be no question as to the great advantage, even from a pecuniary point of view, of the decreasing sick and death-rates, because the individuals concerned were all of the most productive ages; and also, because the expense entailed on the State in replacing them, more particularly in India, was very large. And yet the health of the Army was not as satisfactory as it should be, nor were the barracks in anything like a reasonably satisfactory sanitary condition. Thanks to the liberality of the House of Commons, and to the determination of the Secretary of State for War (and to the Sanitary Committee, of which Sir Douglas Galton was a distinguished member) to do all that was possible to remedy known defects, we might hope that the 4,000,000, just voted for barrack construction and improvement would remove all cause of complaint on that score. In civil life, too, we saw satisfactory results following sanitary improvements. Taking an illustration from London in which such works were progressive, although still far from complete, in the quarter ending June last, the death-rate was 17.3 per 1,000, of which 2.5 only was from zymotic disease. Ten years ago the death-rate was 19.0, and twenty years ago it was 22.0 per 1,000. This showed steady progress, and was in happy contrast to similar conditions prior to the completion of the main-drainage scheme. In Brighton the death-rate was still lower, being only 15.6 per 1,000. That was, with two exceptions, the lowest death-rate of any large town in England. Still there was room for improvement, even in Brighton; and with the improved laws now on the eve of passing the Legislature, there was a fair prospect of seeing the mortality reduced to 10.0 per 1,000 before the lapse of another decade.

On the motion of the Mayor of Brighton, seconded by Mr. Baldwin Latham, a vote of thanks was accorded to the President for his address.

We will report further proceedings of the Congress in our next.

#### The Health Exhibition.

The usual Health Exhibition in connexion with the Congress is being held in the Corn Exchange, in the Dome of the Pavilion buildings, and in one of the rooms of the Museum and Art Gallery. The space afforded by these contiguous premises, which are thrown into direct communication with each other, is ample, and we had expected to find an exceptionally good Exhibition in so large and important a town as Brighton. As a matter of fact, it is not so good an Exhibition as some others which have been held under the auspices of the Institute in other parts of the country. This Exhibition, too, differs from its predecessors in not being ready by the opening day. It has hitherto always been the commendable practice of the Institute to compel exhibitors to have their stalls in readiness by the opening day, on pain of being ineligible for examination by the judges. At the opening ceremony Mr. Rogers Field, the Chairman of the Judges of the Exhibition, said it had been their usual practice to make the awards before the Exhibition opened; but in the present instance, although the authorities of the town had done their best, it had been found impossible to get the Exhibition completed. In a few days the awards would be made. We may here mention that the other Judges of the Exhibition are Dr. A. Wynter Blyth; Prof. W. H. Corfield; Mr. T. W. Cutler, F.R.I.B.A.; Mr. Baldwin Latham, M.Inst. C.E.; Mr. H. Law, M.Inst. C.E.; Dr. Louis Parkes, D.P.H.; Mr. J. Wallace Peggs, Assoc.-Mem. Inst. C.E.; Dr. J. C. Steele; and Mr. Ernest Turner, F.R.I.B.A. Although the Exhibition contains a great many excellent sanitary appliances (as will be seen by our enumeration of some of them), there are comparatively few novelties that are likely to be of much practical utility. Nevertheless architects, builders, and house-owners and occupiers in the South of England, as well as visitors to our southern watering-places, will find much to interest them in the Exhibition, which will remain open until Saturday, September 13.

Most of the exhibits which are of special interest to our readers will be found in the Corn Exchange portion of the Exhibition. Here are arranged the great bulk of the exhibits in "Class I., Building Materials, Construction, and Machinery;" "Class II., Water Supply and Sewerage;" and "Class III., Heating, Lighting, and Ventilation." Each of these "Classes" is in the catalogue divided into numerous "sections," but as many of the exhibitors are represented in two or three of the "Classes" and in several of the "sections," we will avoid the needless repetition of names by noticing some of the principal exhibits stall by stall in numerical order, ignoring the classification of the catalogue, which is perhaps somewhat overdone, having regard to the scantiness of material in some of the sections.

At Stall 3, the Burnautofts Company, Leeds, are staked in the catalogue as exhibiting, besides decorative pottery, the "Burnautofts Fire-sides," with grates, fire-backs, hearths, and kerb fenders complete; but up to Tuesday morning their exhibit was not *en evidence*.

Messrs. J. Tylor & Sons, London, have, at Stall 6, a very good show of baths, lavatories, urinals, water-closets, water-waste-preventing flushing cisterns, brasswork, disconnecting traps, and gullies. One of their specialties well worth attention is the patent "Column" pedestal closet, which is made in one piece of earthenware, with lead trap to shoot either out or down. The use of a lead trap, it is urged, ensures the joint between the closet and soil-pipe being well made. The lead trap is joined to the earthenware basin by a simple brass collar, as in the ordinary valve-closet. This joint between earthenware and metal,—always a difficult joint to make,—is above the trap, and hence there is no danger of sewer-gas entering the house through careless fixing. Several other good closets are shown at this stand, including the "Compound" pedestal closet, in which the force of the flush is exerted directly on the water in the trap. The same exhibitors' patent "Universal" disconnecter traps and patent connectors are very good and convenient, and capable of application under a great variety of circumstances.

The London Water Meter Company (Ltd.) exhibit (Stall 7) their patent service-meters, which are shown in action. They are very simple in construction, have few working parts (which are all made interchangeable), and seem to be calculated to ensure unvarying accuracy

of registration, whatever the pressure or rate of the flow. They should certainly be seen by all who are interested in preventing waste of water or who wish to pay only for what they use.

At Stall 8, Messrs. Bostel Brothers, of Brighton, have a varied collection of sanitary appliances and fittings, including a bath, lavatories, urinals, water-closets, sinks, air-tight manhole-covers, traps, and Maignen's "Filtre Rapide." Their patent "Brighton" drain-trap, with diminishing channel, is a very good one. They exhibit a "silent-action" syphon-flushing cistern, and some very good forms of water-closets, including the improved "Brighton Excelsior." Their "Artizan" closet may be specially mentioned as worthy of commendation for simplicity and efficiency. It is a pedestal closet, made in one piece of earthenware with the trap, and with a vertical back allowing of a direct drop into the water of the trap. It is efficiently flushed by Holmes's patent cylinder syphon waste-preventing cistern. It is worth noting that these exhibitors recommend the provision of brackets to keep the weight of the seat and of the sifter off the earthenware, their reason being that in most closets of this type the trap is in one piece with the basin and the connection with the soil-pipe has necessarily to be made below the trap. It is obvious that the vibration caused by a constantly falling lid, or by the movement of a person whose whole weight rests upon the earthenware, must in time tend to loosen the joint, and to make it the channel for the admission of the air of the soil-pipe into the building. Visitors to the Exhibition should not leave this stand without inspecting the very ingenious screw-down tap, for hot or cold water, invented by Sir William Thomson; there are no leather or rubber washers in it, and no packing round the spindle. It is entirely of metal, and cannot be injured by over-turning.

Mr. D. T. Bostel, of Ebury-street, London (Stall 9), exhibits a varied assortment of plumbers' brass-work of good quality, some effective but silent flushing cisterns, and the "Brighton Excelsior" closet in various forms, including that with the "Tarver pattern" pedestal, which is an agreeable improvement on the too often unsightly appearance of these pedestal closets: being unsightly, they are sometimes boxed-in or masked in some way,—an expedient to be strongly deprecated on sanitary grounds; the "Tarver pattern" pedestal affords no justifiable pretext for concealment.

Stall No. 10 is occupied by Mr. John Jones, of Sydney-street, Chelsea, who exhibits some novelties worth notice. Firstly, we may mention a simple but ingenious pipe- or drain-stopper, for temporarily stopping drains or pipes when under repair, or when being tested. It consists, briefly described, of an earthenware ball or cylinder of indiarubber or other material, connected with a length of flexible tubing to a small air-pump or bellows. The expandable balls are made of various sizes, to suit large or small pipes. Inserted while in a condition of collapse into the drain or pipe to be stopped, they are readily inflated or distended under sufficient pressure to effectually dam up the liquid or to prevent the passage of gas. The turning of a cock on the flexible tube at once releases the air which inflates the stopper, which is then readily removed. Mr. Jones also exhibits a new manhole-cover, the principle of which is to utilise the liquid formed by condensation on the under surface of the manhole-cover for automatically making a gas-tight seal round the edges of the cover. The weight of condensation trickles down the under surface of the cover, and runs into a continuous groove or channel, into which the edges of the cover dip. This exhibitor also shows a chimney-cowl which appears likely to prove very effective in preventing down-draught and smoky chimneys.

At Stall 11, the Corporation of Brighton through the Borough Surveyor, Mr. F. J. C. May, are described in the catalogue, and in the Brighton papers of Tuesday, as exhibiting a model section of house, showing the system of drainage and ventilation adopted in Brighton and the method of testing new drains; together with models of flushing shafts for cleansing house drains and sewers. But these exhibits were not on view up to Tuesday mid-day, so we can say nothing about them now.

Messrs. John Smeaton, Son, & Co., of Great Queen-street, London, exhibit, at Stall 13,



very good selection of baths, lavatories, and water-closets, and other sanitary fittings. Their patent "Amphora" closet is well worth notice. It has a rapid and effective flush, and has a good appearance. These exhibitors also provide brackets for taking the weight of the seat and sifter off the basin, and the brackets are hinged so as to fold back to allow of more readily cleaning behind and around the basin. This firm also exhibit some very good automatic siphon-action flushing cisterns for urinals, &c. They also show an admirable slop-and-draw-off sink, with copper tube for flushing and a hinged gun-metal fork or tripod upon which to stand a pail. Among their other exhibits is a very complete spruce, douché, and plunge bath, with shampooing apparatus; a new regulating safety-valve for kitchen cylinders and boilers; and a dust-shoot lid or hopper for artisans' dwellings; this hopper is so contrived that when pulled open the air in it is shut off from the dwelling.

At Stalls 14 and 15 Messrs. Burn & Ballie, of Edinburgh, exhibit the patent "Eclipse" drain-testing apparatus, which may be described as hydro-pneumatic in principle. If it detects a leakage, it is provided with means for applying the smoke test to discover the exact point of leakage. The same firm exhibit some lavatory-basins, embodying an important improvement in regard to the accessibility of the overflow for cleansing, and a good quick-filling and quick-discharging bath.

Mr. H. Heim, of London (Stall 18), shows his "Helios" chimney-piece stove, for which it is claimed that it will burn a whole day without attention, at a cost of threepence. At the next Stalls (19 and 20), the Eagle Range and Foundry Company show some of their ranges and stoves in action. At Stall 22 Messrs. Geo. M. Hammer & Co., of London, have a very good show of church and school fittings. Stall 27 is occupied by Messrs. Crossley Bros., of Manchester, with one of their 7-h.p. horizontal gas-engines. Messrs. William Sugg & Co., of London (Stall 28), exhibit gas-cooking ranges, &c. At Stall 31 Messrs. Merryweather & Co., of London, exhibit in action their patent "Microboliser" or drain cleanser, recently described by us (see *Builder*, p. 113, ante). At Stall 33 the Sanitary and Domestic Engineering Company exhibit the "Wallas" patent indicating drain block, for ensuring accuracy in fall when laying drain-pipes and sewers. This was described and illustrated in the *Builder* for Jan. 18 last (p. 41).

Messrs. Doulton & Co., of Lambeth (Stall 32), have, as usual, a very good collection of exhibits, including a variety of water-closets of various types. The "Simplicitas" wash-down closet and trap in one piece is specially worthy of notice on account of its efficiency and cheapness. It is largely used, we believe, in Post Office buildings. Other closets too numerous to mention are shown, as well as an improved stoneware urinal, without basins or angles, and which, regularly flushed by automatic cisterns, seems likely to remain always sweet and clean. This firm also exhibit a variety of excellent flushing cisterns, including the "Paisley" (with a very rapid and effective flush) and the "Thirlmere" (adopted by the Manchester Corporation). They also show their patent self-adjusting joint for drain-pipes under test as to its water-tightness.

Messrs. Peters, Bartsch, & Co., of Derby (Stall 36), exhibit their "Carbolineum Avenarius," and proofs of its efficiency as shown by specimens of woodwork treated by it contrasted with specimens not so treated.

Messrs. T. H. Durrans & Sons, of London (Stall 38), exhibit their patent metallic-jointed air-tight cover, which has truly turned and round bevelled faces, which are brought together by a bayonet-joint fastening in a very ingenious manner. It has previously been noticed by us. Their "Dukbak" accessible gully, and their patent grease-trap, are two appliances worth inspection; and their "Dukbak" stable-floor, for stalls and loose boxes, is likely to do much for the healthiness of stables and the comfort of horses.

Messrs. Joseph Cliff & Sons, of New Wortley, Leeds (Stall 41), have on view a good selection of their well-known specialties, amongst which we may mention an inspection-chamber with Winsor's channel-bends; Light's patent intercepting-trap, which has an air-tight flap as well as a water-trap and ventilating pipe, as an additional precaution against the admission of sewer-gas into the house-drain; and a new double joint for drain-pipes: the pipes are

made with elongated sockets, and that portion of the socket remotest from the lip is provided (as well as the spigot end of the pipe) with Stanford's joint. The portion of the socket nearest to the lip is made with an annular groove to receive liquid cement, which is poured into the luted joint after the pipes have been fitted together, so that here we have the Stanford joint backed up by a cement joint. Enamelled fireclay baths, the "Cecil" slop sink with flushing-rim, Winsor's grease gully, and some good enamelled bricks are a few other items out of many worth attention at this stand.

At Stall 45 Mr. A. T. Angell, of Fulham-road, exhibits his manhole-cover. At Stall 47 Messrs. Smith, Collier, & Co., of London, exhibit their very simple and convenient Venetian blind fittings, of the merits of which we spoke in our issue of July 19 last, p. 54. At Stall 48 the Archer Pipe Company, London, exhibit the Archer drain-pipe joint under tests as to strength and water-tightness. This excellent joint has already been described and illustrated in our columns. At Stall 49, the Walker Sewer Valve Company, London, exhibit their patent sewer valve, which has some very good points to recommend it. Stall 50 is occupied by Mr. F. Augustus Moore, of London, who shows his ventilating appliances, including the "M.P." globe chimney-cowl and ventilator. Messrs. Illingworth, Ingham, & Co., Leeds, exhibit parquet flooring, &c., at Stall 51.

Messrs. C. Kite & Co., of London, Stall 52, have, as usual, a very good display of their well-known and effective ventilating appliances, of which we have often spoken in terms of commendation. Stall 53, described in the catalogue as displaying Mr. John Hewes's "patent plans or drawings of sewage-sludge cremator, with samples of by-products therefrom," was invisible at the time of our visit. At Stall 54, the Rainbow Engineering Company, London, exhibit drawings of the "Rohrer" system of filtering, heating, and circulating the water of swimming-baths. Stall 55 is occupied by Moule's Patent Earth Closet Company with samples of their appliances.

At Stall 56 Messrs. Hayward Bros. & Eckstein, of London, exhibit their well-known specialties in the shape of pavement and stall-board lights, as well as Hayward's Sheringham inlet ventilators and Hayward's improved mica-flap outlet ventilators. They also exhibit the "Southwark Universal Venetian Ventilator," which consists of a perforated plate masking a series of louvres. It is available either for the ingress of fresh air or for the egress of foul air simply by reversal in fixing.

At Stall 52, in the Dome, the Morris Tube Ammunition Company, London, exhibit a selection of the Morris patent circulating water-fitter. At Stall 104, in the Art Gallery, Messrs. W. Woollams & Co., London, show specimens of their artistic and non-poisonous wall-papers. Stall 105 in the same gallery consists of an erection showing the decorative capabilities and varied applications of Aspinall's Enamel.

The Exhibition, as already mentioned, will remain open until the evening of Saturday, September 13.

#### SANITATION AT GREAT YARMOUTH.

THE Annual Summer Meeting of the Association of Public Sanitary Inspectors of Great Britain was held at Yarmouth on Saturday last, on the invitation of the Mayor (J. W. B. Johnson, Esq., J.P.), who at 10.30 a.m., accompanied by the Medical Officer of Health (Dr. John Bately) and the Borough Surveyor (Mr. J. W. Cockrill, A.R.I.B.A., Assoc.-M.Inst.C.E.), received the members at the Town-hall, and a quarter of an hour later took the chair and formally opened the proceedings by cordially welcoming the Association to Yarmouth. They in Yarmouth had for some years past been doing a great deal for the sanitary welfare of their ancient borough, but he did not suppose they were quite perfect; and if the members of the Association, from their fund of practical experience, could teach them anything, they would be only too glad to learn. Sanitary inspectors were not only inspectors of nuisances, but were by many people regarded as nuisances themselves. That opinion of them, he was quite sure, was a most erroneous view to take of an exceedingly important and very necessary body of men. With these words of welcome the

Mayor vacated the chair, which was then taken by Mr. Hugh Alexander, the Chairman of the Council of the Association, in the absence of Dr. B. W. Richardson, F.R.S., the newly-elected President.

Mr. Alexander said they were all very much obliged to the Mayor for his hearty welcome. He (the Chairman) very much regretted that Dr. Richardson, their new President, had not arrived; he had been staying at Swanage for the benefit of his health, and was to have sailed round to Yarmouth. Dr. Richardson, he might say, was unanimously nominated by the Council as the successor of their late venerable and distinguished President, Sir Edwin Chadwick. Dr. Richardson's long and intimate acquaintance with Sir Edwin, coupled with his own great services to sanitary science, fully justified his nomination, which was unanimously adopted by the members of the Association in general meeting assembled. He was pleased to be able to say that Dr. Richardson had accepted the position, and had promised to open the next session of the Association, in November, with an address upon the life and labours of Sir Edwin Chadwick. He also regretted the absence of Sir Robert Rawlinson, who had written stating his intention to be present, but probably at the last moment he was advised not to take so long a journey. The Mayors of Norwich and Lowestoft were also unable to be present, the first owing to ill-health, and the second owing to a business engagement. Letters expressing the regret of the writers for their inability to accept invitations to the meeting had been received from Sir Henry Tyler, Professor Roscoe, M.P., and many other gentlemen. With regard to the objects of the Association, he need not say much. For a long time past every thoughtful and intelligent sanitary inspector had been fully alive to many anomalies connected with their duties and their tenure of office. A statement of those anomalies had been made by him (the speaker) in a paper read by him in December last, and a resolution embodying the points of that report, and expressing agreement with them, would be submitted to the meeting after Dr. Bately's paper had been read.

Dr. Bately, Medical Officer of Health for Yarmouth, then read an exceedingly interesting paper entitled "Historical Notes on Sanitation in Great Yarmouth." We regret that we have not space for it *in extenso*, but we give a summary of its most salient points. He said that where Yarmouth now stands, the waves of the ocean rolled for ages; but in consequence of the action of the tides, soon after the Roman occupation land arose as a sandbank at the mouth of the estuary. Aided by wind and tide, the sand increased, and established itself above high water-mark. Then, assisted by saline vegetation, especially the marrum grass, sand found an entanglement, and most materially contributed to the building up of firm and dry land. The hindrance this sand island offered to the efflux of the tide led to the silting up of the shallow waters of the estuary and made the reclamation of large tracts of swampy land an easy matter. That process, first commenced on the south side, had in course of time been extended from every parish bordering on the waters, so that, the tidal mere of Breydon at the back of the town is all that remains of the ancient arm of the sea. An attempt made some fifty years ago to bore an artesian well near the oldest and highest part of the town revealed the fact that at a depth of 515 ft. occurs the primeval chalk. Upon the chalk is 350 ft. of dark coloured clay, 49 ft. of dark sand, and 111 ft. of clean sand and shingle, the latter being the subsoil of Yarmouth. Through this subsoil the tide still has an action, and the water in the wells rises and falls with the tides. This is a fairly rapid underground current, and it is a happy thing for the town it is thus practically floated. Much liquid impurity gets quickly washed down through the porous sand to the subsoil water, and if this were stagnant, or, in other words, if it were water-logged, what a glorious cesspool Yarmouth people would be living over! But this underground tidal movement not only cleanses the subsoil but washes away all that is objectionable, and, being sand, the soil soon dries, and therefore contributes very little by way of exhalation to the humidity of the atmosphere. In Saxons

\* See *Builder* for Dec. 14, 1889, p. 492.

+ A happier thing for the town than for the new Town-hall, apparently, which has suffered much from settlement of the foundations.



times and long previous the inland coast line of the estuary mentioned, as well as the seaboard of Norfolk and Suffolk, was populous with fishermen, and Norwich and Beccles were the markets at which they delivered their catches. When Domesday Book was compiled the waters of the estuary had considerably subsided, but there were then numerous salina or salt-pans in operation at many villages now remote from the sea. As soon as the Yarmouth sandbank had become permanently established above water, fishermen flocked hither, and during the herring season especially considerably crowded the Yarmouth island. As fishermen came faster than the land grew to accommodate them, their houses, or rather huts, were planted so close together that there was barely room to pass between them. A somewhat more orderly arrangement soon became a necessity, so that their fronts and backs at least might afford free passage and have some amount of light and air. Being as it was a very small island and area, exceedingly precious, the early inhabitants could not afford to waste it in making the streets any wider than was necessary for pedestrian traffic. Hence the peculiar character of the old and ancient portion of the town, where these narrow streets are called "rows," a Saxon name evidently referring to the houses on each side rather than to the streets themselves. The herring has ever been king at Yarmouth, and during its early days, and indeed until the Black Death of the fourteenth century, the fishing and the commerce it gave rise to had the first and chief attention of the authorities. Prior to that fearful visitation the sanitary condition of Yarmouth, resulting from the habits of the people and the dirty processes of their trade, must have been dreadful indeed. The earth, air, and water were much polluted by the filth resulting from so many people being huddled together and carrying on their fish-curing almost in their own houses. Their streets and "rows" were not paved, the only drain being an unbricked gutter down the middle, until the absorbent sand received its sluggish liquid sewage. With such a state of things more or less disease must necessarily have resulted. Nevertheless, pestilence was accepted as a Divine infliction, and regarded as inevitable. The connexion between dirt and disease was hardly dreamt of. Dr. Bately next graphically described the visitation of the Black Death in 1349, and called attention to a silent witness of the severity of the plague, the ancient foundations at the west end of St. Nicholas' Church. In 1330, when the town was at its zenith of early prosperity, it was proposed to erect a magnificent western front to the church, which would have formed a vestibule 107 ft. long, corresponding with the width of the church, by 47 ft. in breadth. The western door would have been set in a deeply-splayed entrance 40 ft. wide, flanked on either side by a fine octagonal turret, with others at the north-east and south-west corners, and the whole work would have been richly decorated. This grand piece of church work, which would certainly have given the structure a cathedral-like appearance, was to be known as the Bachelors' Aisle, as it was commenced and carried on for eighteen years by the young men of the town. This noble pile, although prepared 60 ft. from the ground, was, after the plague, left to decay during 300 years, when a portion of it was removed to fill in the piers at the Haven's mouth. A few years later more of it was demolished to strengthen the fortifications, and in 1714 all that then remained above ground was removed to form the foundations of St. George's Chapel. Succeding visitations of pestilence did not do much to stimulate remedial measures until 1584, when a dread of the return of the plague moved the Assembly (as the then governing body was called) to appoint scavengers to cleanse the streets. Again in 1590, when a similar alarm was felt, women were appointed to visit the houses where any sickness or death should happen and report whether it was the plague, and if so, such houses were to be watched, and no one allowed in or out unless every person entering remained there a month. Such houses were to be supplied with all necessary things by a general collection, where the parties could not obtain them at their own charge, and every Saturday night lists were to be made of all who had died in the previous week and of all infected houses. And "for avoiding God's judgement upon drunkenness, then common in the town," and all meetings which might spread the in-

fection, it was ordered that no person should resort to an ale-house, except with a stranger and for especial business, and also that all bedding, clothes, &c., that should come out of infected houses, should be carried near the North Mill, or the old Haven to the south, to be aired on stakes set up for that purpose, on pain of having the bedding, &c., burnt. The plague was still prevalent in 1597, for on May 9 of that year the aldermen, constables, and vintners were ordered to visit "all houses and people as have the plague," and to direct that "the doors be spered in, and the people also." Fires were ordered to be made throughout the town every Tuesday and Saturday night. "Spering the people in," whatever proceeding that may have been, seems to have had little effect upon the pestilence, and we find a far more sensible order on October 6, 1598. "That the alderman of every ward should appoint a scavenger in his ward for weekly cleansing the gutters, drains, &c., and each alderman with three or four chief of the housekeepers to assess the ward with a weekly rate to defray the expense, and if any refuse payment, the constable to seize their goods and sell them. The alderman to appoint carters for carrying away the muck, and any refusing to cart it to be imprisoned." Here we have a whole Sanitary Act in a nutshell, and this order seems to indicate a more intelligent conception of the relationship of dirt to disease than we have hitherto met with. Anyhow, with the advent of the seventeenth century a considerable improvement in sanitary effort is very evident, for we read of penalties attaching to those depositing refuse on the quays, streets, or public places of the town, and to carters not properly disposing of "that they carry forth from the town." Nuisances were prohibited in the town, all filth had to be placed by the sea shore, to be washed away by the tide, and again and again did the Assembly order "that this be done." In 1601 the streets were thoroughly cleansed and paved, and Henry Hill was appointed overseer to see the streets and gutters cleansed, "and to receive the fines levied on those who neglect to clean their gutters, &c., for his trouble." This gentlemen seems to have been the first inspector of nuisances, and as his salary depended upon his energetic action, no doubt he carried out his office as thoroughly as he could. Notwithstanding his exertions, the plague reappeared here in 1602 and 1603, and it was deemed advisable to revive the orders of 1597 respecting the aldermanic visitation of infected houses; to prohibit wools and woollen cloths being brought from London, where the infection was very life, under a penalty of 40l.; to make collections for the infected poor shut up in their houses; and to do many other things. Our early sanitarians certainly did not err on the side of lenity. In 1610, the channels and gutters crossing the Quay—and they were the principal drains in the town at that time—were covered in "very neatly," so that "men may pass along the Quay without annoyance, and the poor beasts draw their burdens far more easily than in former times they could do." Recently, in renovating the Quay sewers, many of these early ones were taken up, and they were found to be merely bricks placed on each side of the original trench or channel, with others on end meeting above, and without any flooring. In not a few instances oaken planks from defunct ships were in the place of bricks. In conclusion, Dr. Bately referred briefly to present-day sanitation, and to the claims of Yarmouth as a health-resort.

On the motion of Mr. E. R. Boulter (Bexley), seconded by Dr. Wynne (Medical Officer of Health, Lowestoft), a hearty vote of thanks was accorded to Dr. Bately for his paper.

Mr. Wilkinson, Chief Sanitary Inspector for the Borough of Derby, then moved the following resolution:—

"That in the opinion of this meeting, the administration of sanitary law would be greatly improved by the following amendments thereof, prescribing:—1. That every candidate for the position of sanitary inspector shall have a general knowledge of the building trades, and in addition shall possess a certificate in sanitary science. 2. That sanitary inspectors shall be elected to a permanent tenure of office, and shall only be dismissible for misconduct or proved incompetence, with right of appeal to the Local Government Board. 3. That it shall be the duty of sanitary inspectors to periodically inspect the dwellings of the district in which they are appointed for the detection of nuisances, and to receive complaints of nuisances and serve notices forthwith requiring all necessary work to be done for the abatement of the nuisances; such notices to be as valid, if confirmed by the local authority, as if served

by the authority's order. 4. That in all appointments requiring the officer's whole time to be given to the duties of his office, an adequate minimum salary shall be prescribed. 5. That the officers, now variously named 'sanitary inspectors' and 'inspectors of nuisances,' be designated 'sanitary inspectors.'"

In an able speech he enlarged upon each of these heads.

Mr. Jennings (Rotherham), a rural inspector supported the motion by a speech which lost nothing in effectiveness from its under-current of dry humour. He narrated the very hard case of a rural inspector well-known to him who was appointed for five years at the "enormous" salary of 225l. a year, out of which he had to find his own horse and "trap." When the term of his appointment had nearly expired, there was a movement on the part of some members of the Board under whom he had served not to reappoint him except at a salary reduced by 40l. per annum—not that they were dissatisfied with him, but because they thought the salary was too high! Ultimately, the officer was reappointed at a reduction of 15l. per annum, on condition that he would take care that his employers (the Board) should spend as little money as possible! The poor man, who had no chance of other employment, was obliged to accept these terms. Such a case was an injustice not only to the officer, but to the public. Why should officials the proper performance of whose duties was of so much importance to the public be dependent on the caprice of their employers as to the tenure of their offices, when a Board of Guardians could not dismiss even the gatekeeper of their workhouse without the permission of the Local Government Board?

Mr. Nicholson, Town Clerk of Lowestoft, having suggested a verbal amendment in one of the sections of the resolution, which was agreed to.

Professor Stuart, M.P., addressed the meeting. From what had been said by the previous speakers, and from what he had read (by the kindness of Mr. Alexander) as to the anomalies which existed both with regard to their powers and responsibilities as public officials, and as to their salaries and tenure of office, he thought they had a very good case indeed, and he should do all that he could as one member of the Legislature to remedy the defects and grievances from which they suffered. There could be no doubt that the effectiveness of the sanitary administration of the country was largely dependent upon the sanitary inspectors, and therefore any representations which they had to make with the view of rendering their services of greater value to the community were worth very careful consideration. Sanitary inspectors were, indeed, the pivots upon which the sanitary administration of the country turned, and they should not be deficient either in responsibilities or powers. He was very pleased to find, from one of the sections of the resolution, that there was a movement on their part not only for examination, but for something like a curriculum of study. As had been very well said by the mover of the resolution, an examination alone would not and could not afford an adequate test of a man's competency to act as a sanitary inspector, who, to judge of what was required of him, ought to be acquainted with building construction, and to be something of an architect and engineer, as well as a bit of a lawyer. But while it was, no doubt, very desirable that sanitary inspectors should have a knowledge of building construction, it was still more to be desired that building workmen themselves should have a knowledge of building construction and sanitary principles, especially the plumbers, upon the excellence or otherwise of whose workmanship the health of the public was so largely dependent. But in justice to the English plumber he was bound to admit that English plumbing was much superior to that of other countries, so far as his own personal observation went.

On the motion of Mr. E. Tidman, C.E., seconded by Mr. Watson (St. James's, Westminster), a vote of thanks was given to Mr. Mayor for his kindness; and on the motion of Mr. J. J. Colman a vote of thanks was given to the Mayor, who briefly replied and invited the members to luncheon.

After luncheon, the members started in carriages to inspect the arrangements for flushing the sewers and watering the roads.

\* Mr. Stuart has perhaps not heard of the excellent work which the Plumbers' Company has been doing many years past in promoting the technical education and registration of plumbers.



be town by sea water, arrangements which have been carried out by the Borough Surveyor Mr. Cockrill) with very satisfactory results. Mr. Cockrill accompanied the party, and gave some interesting particulars. The works were commenced in 1886, and cost £500. The pumps are 12 in. in diameter with 15 in. stroke, and are driven by an 8 horse-power Crossley gas-engine. The distributing tank is 45 ft. above low-water level, and has a capacity of 2,300 gallons. The rising and distributing mains are now nearly eight miles in length. There are forty-three valves for flushing the sewers direct from the water-mains, varying in size from 6 in. to 3 in. in diameter, in addition to which there are fourteen self-acting syphon flushing tanks of a capacity of 3,000 to 2,000 gallons each. The cost of water for street watering and sewer flushing in the town district previous to putting in this installation of sea-water service was £550., for which rather more than ten million gallons were obtained. Of this about seven million gallons were used for street watering, and only about three million gallons for sewer flushing. The result of last year's working of the sea-water works was that about forty million gallons were raised, at a cost of about 400., or less than 3d. per 1,000 gallons. This sum includes all charges for interest, repayment of capital, and working expenses. Of the forty million gallons raised, about five million gallons were used for street-watering, and the remainder, or about thirty-five million gallons, for sewer-flushing. The effect of this had been to thoroughly cleanse the sewers, and combined with improved and increased ventilation had been to place the great proportion of the sewers in a condition which Mr. Cockrill thought could not be much improved upon.\*

After concluding their inspection of the sewer flushing arrangements, the members had a pleasant drive to Ormesby Broad, whence Yarmouth derives its water-supply. At the waterworks, they were received by Mr. E. P. Couell, the Chairman of the Water Company, and by Mr. Ayris, the Engineer and Manager, who explained the arrangement of the works, which are a model of cleanliness and order. The water is twice filtered through filter-beds made from the sand and pebbles brought from Yarmouth beach. A very ingenious machine for washing the sand was shown at Mr. Ayris stated that about 800,000 gallons of water per day are drawn from Ormesby Broad, and there is a constant service system throughout Yarmouth. The only precaution taken against waste is to insist on fittings of the very best quality.

Having thanked Messrs. Couell and Ayris for their kind reception, the visitors drove back to Yarmouth, and so concluded a very pleasant and instructive outing.

## Correspondence.

To the Editor of THE BUILDER.

### VITAL STATISTICS OF SCHOOL CHILDREN.

SIR,—Amongst the various important papers read at this year's meeting of the Sanitary Association of Scotland at Perth, under the presidency of Dr. Cameron, M.P., the one read by Professor Matthew Lay, of Aberdeen, calls for special consideration. That "the death-rate among children between ten and fifteen had actually increased" is a rather remarkable statement, while the assertion that "the health of children of the school age did not appear to have improved," raises the question, Why not? An outsider would have thought that with the erection of so many palatial-looking schools the health of the children must have improved; but when we enter the schools the solution of the problem is not far to seek, for the foul-smelling atmosphere that saturates the nasal organ quickly kills where the angel of disease and premature death has his home. We kill our children by bad air just as surely as by liquid poison.

Professor Hay asserts the same in other words when he says:—"The first and great essential to the improvement of the hygiene of schools is a sufficiently pure atmosphere within the school-room." I have been visiting a number of schools in Glasgow and elsewhere lately, and the atmosphere of some of the school-rooms just before closing was not disgusting to a person entering from the fresh air outside. In most of the cases the teachers complained strongly of the bad provision existing

for ventilation, and my knowledge of the subject enables me to say they had good cause. In some large schools, even in Glasgow, the provision for ventilation was by opening the windows, which has been so justly condemned by Professor Duncan and Mr. Honeyman. A gentleman accidentally came to my testing remark lately when I was going home in the train one evening. I happened to be speaking to a gentleman sitting beside me about the bad ventilation in our schools, when another gentleman opposite suddenly remarked:—"My children are at the X schools, where they seem to be between the devil and the deep sea as regards ventilation. When the windows are open, they catch the cold; and when they are shut, they are poisoned by bad air." Might it not be better in this case to give fewer bursaries and prizes, and instead to improve the ventilation? At one Board School, where the ventilation was microscopical and the merest sham, the head teacher stated that the air was sometimes so bad and close that the children turned sick and had to be sent home! This was a country school. In a Glasgow Board School, however, where the atmosphere smelt very bad, when I visited it the means of ventilation were holes in the ceiling. In one room facing the east the teacher said, "When the wind is from the east, we have to stop the top of the room, as the cold air comes down so badly on the children." As to another room, the remark was made, "The pupil-teachers complain very much of the bad ventilation here when they come up for examination, and especially of the way in which the cold air blows down upon them when engaged at their tasks." At another large new school the head provision for the outlet ventilation only amounts to 12 in. of outlet area for each pupil, only a small 9-in. pipe for a roomful of about seventy scholars, and this, too, in a city school! It ought to be five times as much, especially when the ventilation is automatic. Mechanical ventilation has been mentioned as the cure for all this, but unless it is properly carried out, it will not improve matters either. For one of the worst smelling rooms I felt was one large room ventilated mechanically, but with only two 9-in. outlets, and these a long distance from the fan, for 130 pupils. I visited one well-ventilated school at Glasgow, in Cecil-street, Hillhead. It is ventilated mechanically, with an Otto gas-engine and an extraction fan inside the room. For country schools well situated, and if only one story, mechanical ventilation is quite unnecessary. Satisfactory automatic ventilation can be got quite easily if the pipes are put in of a proper size, and provision adopted against down-draught. It is perfectly shameful, in a Christian country like ours, to find how largely the children are affected in this respect. Were Dickens living, he would supplement "Dotheboys' Hall" with a stirring account of Kill-the-Children's School. Sanitation has advanced so far in the interests of the public that new houses are not allowed to be occupied until they are in a proper sanitary condition. This should be extended to schools; and any school that has not proper ventilation should not get any Government grant. I understand the Education Department has, in some cases, taken action in this direction. In cities especially, a written complaint from a parent to the Medical Officer of Health ought to give him ground for examination of the school, and if he should find it faulty, he ought to be able to force its improvement; while the new sanitary officials under the new County Councils—like new brooms—ought to make a grand sweep of the causes in this relation of the ill-health and high death-rate among the children.

W. P. BUCHAN.

### SALARIES OF CLERKS OF WORKS.

SIR,—Will you kindly allow me to call the attention of your readers to an advertisement in this week's issue of the *Builder* for a clerk of works at the remunerative salary of 2l. 2s. per week.

It is only because of the repeated attacks which are made on the character and ability of clerks of works as a whole that the thing is worth notice at all; I will, therefore, put what I have to say as shortly as possible, in order to claim your attention.

The usual "competence" is asked for, with a thorough experience in all branches of building, "especially brickwork." Now, in London and in many of the large towns, there is at present a fair demand for bricklayers, whose wages would equal, and in some instances, exceed, 2l. 2s. a week. On my own job the bricklayer's money has amounted to 2l. 1s. 3d. for some time past. The bricklayer's general standard of living is of necessity much lower than would be accepted by the advertisers in the person appointed to the post. Looked at from this low standard the persons offering such a salary can surely not understand who or what they want.

Their advertisement asks for a man of experience in all branches of building, with special reference to brickwork; and I unhesitatingly say that they will not get an honest man with the required abilities, nor have they a right to expect it. As long as public bodies and others about to build continue to offer, and men are found, from various circumstances, to accept such wages, dirty exposures must be continually expected, bringing disaster and discredit to both architect and client, and covering

with shame an honourable and useful body of professional men. Considerably higher ground might be taken in urging the fallacy of offering such wages. A clerk of works, as a rule, is an expert workman in one or other of the building trades, and by patient study and perseverance has raised himself to an honourable position, as he thinks, above his fellows. He is a good general draughtsman, and is expected, in a position of peculiar temptation, to be strictly honest. Yet there are people ready to offer him not more, if as much, as the workman under his supervision, without one thought beyond their labour. A client entrusts a clerk of works with the superintendence of a building costing him many thousands of pounds, and if his servant be not true to him he may be robbed with impunity, yet he boggles like a huckster over the wages he must pay him. The wily builder knows methods of reaching the low-waged clerk of works.

The Amersham job may be much, or it may be nothing at all, but its advertisement is sufficient, I feel sure, to call forth the condemnation of a journal which is interested in keeping all the professions connected with architecture and building as pure as it may be possible.

Geo. DALTON,  
2, New-street, Erdington, Birmingham, Aug. 28.

### LINCOLN'S-INN GATEHOUSE.

SIR,—It was with much surprise I noticed in your columns recently some allusion to the proposed removal of the Gate-house of Lincoln's Inn in Chancery-lane.

For some years past I have regretted that no effort was made to at least clean and repair this, one of the few surviving gateways of London; and now, if not soon, we are to be robbed of it, one of our ancient and only too few authentic examples of the later Mediaeval building.

What useful purpose can be served by this spoliation I have not chanced to hear, but call the attention of your readers to the similarity of the general outline and mass of this structure to those of other gate-houses of the thirteenth and fourteenth centuries, when the leading features continued the same as in former times, but with the refinements of the later Gothic nearly lost.

Whether this gateway ever had a groined stone or brick ceiling is doubtful, but there can be no doubt that the turrets were finished with battlements in cut brickwork, like the Eyre House Gate House, and probably had leaden-covered cupolas and vanes, which could be now added, for which probably some old engraving could be found to authenticate the design, and this would give much effect to the elevation.

The front would also gain in picturesque appearance by the correct glazing of all windows with lattices and diamond panes instead of the extremely ill designed sash-windows of Georgian era.

Again, the removal of perhaps thirty or forty coats of paint from the oak gates, which are sound, and of fairly good design, would give these a fair chance of showing their original surface; and although I do not advocate painting, and thereby scraping the whole of the brick front, yet a good washing and careful replacing of all damaged bricks would do much good. As the Benchers of this Inn have in past times been foremost in building on a noble scale, it probably would not be with them a matter of great moment to restore this, their most ancient entrance, and the first a visitor to their Inn meets on his approach from the city.

L. C.

### OLD COTTAGES IN GLOUCESTERSHIRE.

SIR,—In the *Builder* of the 9th inst. and 23rd inst., reference is made to "Old Cottages, Gloucestershire," and there is also the notice of Owlpen Manor-house; but upon the hills of Gloucestershire there are cottages and farmhouses, which were formerly occupied by the gentry, well worth notice. At Doudeswell, four miles from Cheltenham, on the Oxford side, there is a farmhouse close to the church which would not escape the observation of any one interested in old houses, and about half a mile higher up the hill, and in the same parish, there is another of this description.

In the next village, Whittington, there is the "Court," with the moat, and which was occupied a few years ago by the eminent architect of Gloucester, Mr. F. Waller, and which his experienced hand much repaired.

At Shipton there are old cottages and a very interesting church, which retains the mark of a Norman doorway on the north side, and where there is an excellent specimen in the chancel of Early English windows, with detached shafts, forming a good type of the earlier date of this style, which is also found at Swenhampton and Charlton Abbots. Whittington, a few miles further on, has a very fine church, with much Norman work to be traced in it, and some houses of antiquity worth seeing, amongst which I must mention Casey Campson.

It would make my letter too long to proceed further, although the account might be much enlarged, especially when I mention that at Notgrove, on the outside of the church, at the south side of the east end, is our Saviour on the cross carved in stone, of course of much antiquity.

E. W. GARROW.

Bislthorpe Rectory, Southwell.

\* A fuller description of these works will be found in paper by Mr. Cockrill in the *Builder* for June 12, 1886, 1888. The same method of utilising sea-water has been adopted at Bournemouth, with, we hear, fully satisfactory results.



## The Student's Column.

## HOT-WATER SUPPLY FOR BATHS, LAVATORIES, &amp;c.—IX.

THE CYLINDER SYSTEM: *continued.*

**F**ROM the extreme top of the cylinder is carried a service-pipe known either as the expansion pipe or "rising main." This is taken by the most convenient way to about 3 or 4 ft. above the level of the cold-water cistern at the top of the house, and its upper extremity is terminated in any of the ways explained with the expansion-pipe of the tank system. This pipe should be fitted and run in the same manner as a flow-pipe,—that is, it should only be carried in horizontal or ascending directions (the former to be avoided if possible), and it is from this pipe that all draw-off services are taken, as illustrated in fig. 17, p. 153 *ante*. When this pipe is of considerable length, or carried in a horizontal direction to any great extent, it is found desirable, and oftentimes absolutely necessary, to return it so that the water it contains may circulate and not become cold. This is a very simple matter indeed, as it is merely to connect a service-pipe at any convenient point, usually close to the highest draw-off service, and carry it down and connect it into the cylinder,—in fact, make a secondary flow and return from the cylinder, fitted in general respects like the primary flow, and return from a boiler. One particular advantage of this secondary return is that it need not come back alongside the rising main; it may be brought back by any other desirable route, which is a great convenience when the hot-water taps are wanted scattered about in different parts of the house, as there is no objection whatever to connecting draw-off services from this return pipe, as in fig. 19.

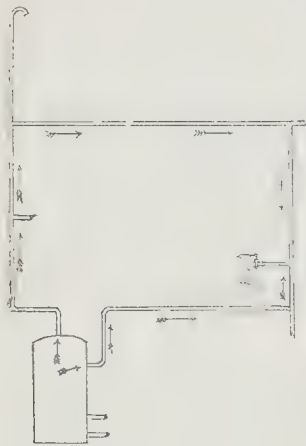


FIG. 19.

There is much difference of opinion as to where the lower end of this return-pipe should terminate; every imaginable place is suggested, and it would be almost difficult to find two average fitters agreeing exactly on this point. In the last illustration it will be noticed that the termination is made about a third of the way down the cylinder, and although this is a position that only a minority of fitters adopt, yet a very short explanation will show that it is the correct one to obtain the best results.

In the first place, we have to aim at being able to withdraw every drop of hot water from the apparatus before having any cold water come from the taps, and in seeking to attain this we have always to bear in mind that when a tap is opened the water instantly rushes from all directions towards the tap in question (the arrows on the last illustration indicate the direction the water takes when a tap is opened, not the direction in which the water circulates when the taps are closed), therefore it will be plainly seen that as the hottest water may be

reliably looked for at the top of the cylinder, it would be bad policy to connect this secondary return any lower down than shown, and especially bad to connect it into the bottom of the cylinder where the cold water enters, as is most usually done. There would be no objection to connecting it even higher than illustrated, as every particle of hot water rises to the top of the cylinder before it leaves the apparatus; it will also be seen that to connect this pipe into the primary return is equally bad.

If it is not required to connect any draw-off services from the secondary return, this pipe may be reduced in size.

The cold supply service is brought down from the cold-water cistern to the cylinder, where it is usually connected in at the bottom, as illustrated; some people, however, connect it into the primary return, and some consider that the boiler itself is the best place to bring the cold supply into; in general good results the bottom of the cylinder is the most satisfactory; but in another chapter will be shown a method of reducing the length of this cold-water pipe in many instances.

The necessary syphon and stop-cock has to be put in this cold service the same as explained with the tank system.

There is a rather important feature that should always appear in this system, but which somehow is very commonly overlooked, even by those who profess this work; it is a means of emptying the cylinder when the boiler has to be opened for cleaning or any other purpose. It is not by any means an uncommon thing for a workman to find when he attends to open and clean out a boiler, that there is no provision for emptying the apparatus, except by the draw-off services, which are all taken from the rising main above the cylinder, and he therefore has but two resources,—one to leave the boiler unopened and uncleaned, the other to take the man-lid off the boiler and let the contents of the cylinder flow into the kitchen, unless the contents of the cylinder are syphoned out through the top with a piece of tube into receptacles placed for them, which sometimes has to be done.

The proper thing is to have a short draw-off service fitted below the cylinder, either from this pipe itself or from the primary return, or from the lowest point in the cold supply service; but the tap of this emptying service must have a loose key, which should be kept with the key of the cold supply stop-cock, so that neither of these taps may be used except by a competent person, as already explained.

The cylinder system has several advantages that the tank system does not possess, but the chief of these is the immunity that it ensures from any danger arising from shortness of water. It will be gathered from the description given that it is most necessary that all ordinary draw-off services be connected to the rising main (above the cylinder), making it impossible for the contents of the cylinder to be drawn off except by the special emptying service; so that should the general supply of water run short, the fire can still be used in the ordinary way, even for a day or two,—that is, until the whole of the water in the cylinder is disposed of by evaporation.

This advantage alone is sufficient to recommend the system, especially in country residences, where the supply of water is wholly dependent upon an odd man's attention to a pump, and it is almost wonderful that accidents are so rare under these circumstances.

One point requiring every consideration in hot-water supply is the pressure exerted by water, either in pipes or vessels which are used as reservoirs. The pressure of water in pipes is generally calculated by the power it exerts in a pipe having an internal area of 1 square inch (this would be about a 1½ in. round pipe); a pipe of this size, 2 ft. 4 in. long, placed vertically and filled with water, would be found to weigh 1 lb. more than when empty, that is, it contains 1 lb. of water; or, in other words, a column of water, 2 ft. 4 in. high and 1 in. square, weighs 1 lb. It is usual to define the pressure of water as so many pounds to the square inch. The word "pressure" might very well be replaced by the word "weight" in some instances, as it is necessary to understand that the strain exerted only varies as the quantity of water varies, and you cannot get variable pressures from a given quantity of water, as you can with steam or gas, as water is practically incompressible.

Water in horizontal pipes exerts no appreciable strain, so that in calculating what pressure has

to be withstood, it is only necessary to measure the distance the pipe extends vertically, and if the cold-water cistern is situated 35 ft. above the cylinder, then this latter should be of sufficient strength to withstand a pressure of 15 lbs. on every square inch of its internal surface.

When a pressure of water is exerted from a pipe into a close vessel, that pressure is transmitted to and felt equally in all parts of the vessel in question,—top, bottom, and sides, without diminution; or, in other words, if the supply-pipe descends vertically 35 ft., the water within it will exert a pressure of 15 lbs. to one square inch, and this pressure will be felt on every part of the cylinder internally; and this makes it easily understood why these reservoirs need be so well and strongly made, the strain some of them having to bear being very great.

The following, taken from the list of a London maker, will show the great difference that exists between tanks and cylinders in resisting pressure, and it will be readily seen why a tank is not suited for the cylinder system of apparatus:—

*Riveted and galvanised iron rectangular close tanks, for hot water:—*

Thickness of plate ..... ¾ in. ½ in. 14 g. 16 g.  
Tested to, per square in. 10 lb. 5 lb. 3 lb. 1 lb.

*Riveted and galvanised iron cylindrical tanks, for hot water:—*

Thickness of plate ..... ¾ in. ½ in. 14 g.  
Tested to, per square inch. 40 lb. 25 lb. 15 lb.

## OBITUARY.

MR. C. W. COPE.—The death is announced, at Bournemouth, of Mr. Charles West Cope, retired *Colonel*, in his eightieth year. According to the *Times*, he was the son of a painter of no mean reputation, and was born in Leeds in 1811. He came to London and first learnt of Mr. Sass, after which he worked at the Royal Academy. After a residence of two years in Italy, on his return to these shores his picture of the "Holy Family" attracted considerable attention. He began to exhibit at the Royal Academy in 1833. In 1843 he entered in the Westminster Hall competition, and for his cartoon of "First Trial by Jury" gained a 300l. prize. The following year found him in another competition for fresco designs, and his success with the "Meeting of Jacob and Rachel" procured for him the acquisition of one of six frescoes for the adornment of the new House of Lords. Having been elected an Associate of the Royal Academy in 1844, he was in 1848 elected an Academician. Mr. Cope was professor of painting at the Royal Academy from 1867 to 1874, and was a trustee of that body.

ALDERMAN J. G. NAYLAR, OF ROCHESTER.—We regret to hear of the death of Alderman James George Naylor, the head of the well-known firm of J. G. Naylor & Son, builders, Rochester. He was seventy-three years of age. He had served the office of Mayor, and devoted much time to public work. Born of poor parents, he was apprenticed (says the *Standard*) to Rochester Glassworks to the late Mr. Bartholomew, who had a small builder's shop and works in Deloe, and here it was that he acquired the rudiments of the trade in which he afterwards became a leader. As an apprentice he was noted for his steadiness and the attention which he gave to his work, and at the conclusion of his apprenticeship he at once commenced business for himself.

MR. JULIUS SAX.—We regret to announce the death of Mr. Julius Sax, M.I.E.E., on the 21st inst., at his residence, 100, Great Russell-street, Bloomsbury. Born in 1824, in Sagare, Russia, he was educated at Königsburg, and went to Hamburg in the year 1845, where he was apprenticed to the late Mr. Eilby, optical instrument maker, of that town. Having served his apprenticeship, he went to Berlin, where he entered the telegraph establishment of Messrs. Siemens & Halske. He came to London in 1851, and worked with Mr. L. Oertling for four years, after which he started in business on his own account for the manufacture of instruments. Mr. Sax was employed by the late Professor Graham, at that time Master of the Royal Mint, to construct automaton and other balances for use in the Mint. At the International Exhibition of 1862 he exhibited bullion and chemical balances, and obtained a prize-medal for excellence of workmanship and accuracy. These balances were, by recommendation of Professor Graham, purchased by the Government for the Mint of Hong Kong. In 1863 Mr. Sax turned his attention to domestic telegraphy, &c., and in 1864 took out patents for a metallic fire-alarm button, which would act as an ordinary call as well as a fire-alarm signal, also indicators to be used with same and for other purposes. In 1869 Mr. Sax invented a form of magneto A B C telegraph; in 1870 an improved mechanical recorder; in 1872 an electric billiard marker; in 1881 an electro-magnetic telephone, an electric water-gauge, an electric tell-tale clock for watchmen, with a fire-indicator combined; and



electric vane; automatic system of electrical call-bells for fire-stations, &c. (adopted by the Metropolitan Board of Works for all the stations of the Metropolitan Fire Brigade in London); a system of call bells for police-stations, prisons, &c., as prepared for and adopted by the Commissioners of the Metropolitan Police for use at all stations under their control; an improved apparatus especially adapted for communicating between drivers and passengers in vehicles; an electric apparatus for locking cash-takings, and a perfected form of automatic fire-alarm. Mr. Sax has also made valuable improvements from time to time in electric bells and appliances for various purposes. His business will be continued by his sons.

### GENERAL BUILDING NEWS.

**WIDENING OF THE GREAT WESTERN RAILWAY BETWEEN MAIDENHEAD AND TWYFORD.**—It is reported that Messrs. John Mackay & Son, of Oxford, have obtained the contract to widen the Great Western Railway between Maidenhead and Twyford, at a cost of over 100,000.

**LIBERAL CLUB-HOUSE FOR SWANSEA.**—The foundation-stone of a new Liberal Club-house for Swansea was laid on the 11th inst. The building is to be erected by Messrs. Thomas, Watkins, & Jenkins, Swansea, and will erect the buildings from the designs of Messrs. Bucknall & Jennings, architects.

**FISH MARKET, DUNDEE.**—The new Fish Market erected by the Police Commissioners on the site at Big Pier, formerly occupied by Newsome's Circus, was formally opened by Lord Provost Hunter. The market is to be under the management of a committee, said the operations of that Committee in Whitehall-street and Greenmarket necessitated the resolution of the Police Commissioners thirteen months ago to sweep away the Fish Market—a circumstance which, he ventured to say, was not deplored by any citizen of Dundee, as the market was a troublesome and inconvenient place for the business transacted in it, nor was it creditable to the city. The new building was described by the speaker as doing credit alike to the architect, the contractor, and the city of Dundee, but the architect's name is not mentioned in the Dundee Free Press's report. The cost of the building has been about 2,600.

**BARRY DOCK.**—According to the *Western Mail*, Messrs. J. Strachan & Co., builders, Cardiff, have secured the contract for the erection of a large dock over the Barry Company's railway to Barry dock. The bridge will have a wrought-iron superstructure, with cast-iron columns. There will be nine spans, with 24 ft. centres. Provision has also been made on the island for a number of new railway tracks for the transit of building materials, &c. Messrs. Strachan & Co. have also secured the contract from the Barry Company for the widening of railway bridge at East Barry, operations in connection with which have been commenced this week. The cost of these new works, which will cost several thousand pounds, is under the supervision of Mr. John Robinson, C.E., the resident engineer of the Barry Company.

**ST. MARY'S ROMAN CATHOLIC CHURCH, SALICOTS.**—The church, which has been undergirded by extensive excavations, has been re-opened after having undergone extensive improvements. A new altar of marble and Caen stone, designed by Messrs. Pugin & Pugin, Westminster, has been erected. The design is Gothic, and from the base of the floor to the uppermost of the height will be about 30 ft. The work was executed by Mr. R. J. Boulton, of Cheltenham. Formerly, the church has been re-decorated by Messrs. Hardman & Co., Birmingham.

**KIRK HAMMERTON CHURCH.**—The foundation-stone of a new church in connection with the Church of St. John the Baptist, Kirk Hamerton, a village which lies midway between Knaresborough and York, has been laid. This church is considered to be the second oldest in Yorkshire. As it at present stands, it consists of an old square tower, a nave, chancel, north aisle, and a transept, the two latter being evidently of more modern origin than the other portions of the building. It has never been re-erected for more than about 100 years. Some time ago Mr. Stanforth was given 1,000l. towards a restoration of the church.

The architect entrusted with the work is Mr. Hodgson Fox, of Durham, and the estimated cost of it is a little over 2,000l. The work in progress consists of (besides the restoration of the old fabric) the erection of an entirely new nave and chancel, with aisle, vestry, and organ chamber, on the north side of the old church—the portion of which will thus be preserved intact in its original position. The new building is designed in the style of the latter part of the fourteenth century, and large traceried windows at the east and west ends accommodation will be provided for 217 persons. Mr. John Keswick, of Micklegate, York, is the contractor for the whole of the work.

**NEW RAILWAY STATION AT MILLFIELD.**—After great deal of agitation, the North-Eastern Railway Company have at last given orders for a new railway station to be built at Millfield, where it was long wanted. The contract has been let to Mr. T. Shatto, of Sunderland, and the work will be commenced at once. The improvements include the widening of the road over the bridge to be 47 ft. 6 in., instead of 25 ft., as at present.

### SANITARY AND ENGINEERING NEWS.

**THE LIVERPOOL WATER SUPPLY: THE AQUEDUCT TUNNEL UNDER THE MERSEY.**—At the meeting of the Water Committee (Wyrwark Works), on Monday, the engineer (according to the *Liverpool Post*) reported that the insertion of the cast-iron segments had been effected with gradually decreasing difficulty, and the rate of progress had, therefore, gradually increased. So far as could be estimated, the engineer is of opinion that the contractors would probably be ready to insert the shield for driving the permanent tunnel in about seven or eight weeks. The portion of the work in which the contractors were now engaged was by far the most difficult they were likely to encounter, owing to the fact that a shield such as would be used in the driving of the horizontal tunnel could not at present be employed. The engineer said that until the work done with the shield had been actually tried he was unable to estimate the rate of progress of the tunnel proper, but the experience gained in the work so far as it had proceeded strengthened his view that it would be completed satisfactorily and without serious difficulty.

**WATER SUPPLY OF GLASS HOUGHTON.**—On the 22nd inst. Col. Charles Hy. Luard, R.E., opened an inquiry at the Old Schoolroom, Glass Houghton, to receive evidence respecting an application made to the Local Government Board for sanction to borrow 1,030l. for works of water-supply for the town of ship. Mr. Glover, Deputy Clerk to the Sanitary Authority, opened the enquiry. He said that as far back as 1879 an inquiry had been held as to the need of a water-supply, which was then reported by the inspector holding the inquiry to be urgent, and the Local Government Board confirmed that report. The matter, however, had been left in abeyance, when a further letter in 1884 from the Local Government Board urged the necessity of no further delay. In May, 1889, a Vestry meeting was held and passed a resolution to adopt a scheme for water-supply, in consequence of which the sanitary authorities instructed Mr. Patterson to prepare a preliminary scheme which would obtain Wakefield water from the Whitwood Local Board at the rate of 10d. per 1,000 gallons, which price the Whitwood Board had agreed to, and the Wakefield Corporation sanctioned. To this scheme the Vestry meeting had agreed, and passed a resolution on January 16, 1890, asking that it be carried out as early as possible, hence the present application. Mr. Patterson, the engineer to the scheme, produced his report and levels of the scheme, and said that the parish contained 10,079 acres, and that the population (1,300) was rapidly increasing by being in close proximity to collieries in the district. The present water-supply was very defective and scanty, and was taken from shallow surface wells. One well was close to manure land and pigeries, and was thus greatly polluted therewith. In fact, all surface wells were impure. Another well was surrounded by porous rock and soil, and a wall surrounding exhibited at present over a dozen deposits of excrementitious matter. Another witness called was Dr. Percival, who gave evidence showing the death-rate to be 33 per thousand. And no wonder, having regard to Mr. Patterson's evidence.

**STRASTFORD SEWERAGE SCHEME.**—At the ordinary meeting of the Strastford Local Board on the 22nd inst., Mr. W. W. Lax, presiding, a letter from the Local Government Board was read sanctioning the proposal of the Local Board to borrow 35,000l. for works of sewerage.

### STAINED GLASS AND DECORATION.

**THE MAYOR'S CHAPEL, BRISTOL.**—The scheme for the restoration of the Mayor's Chapel has now been completed. The window of the newly-erected north transept and the re-opened nave window which adjoins it were last year filled with cathedral glass; but Sir Charles Watkin having promised stained glass for the former, and Sir George W. Edwards for the latter, the designs for the two windows were soon after put in hand. The transept window, designed by Mr. J. L. Pearson, is of fine proportions, some 24 ft. in height and 14 ft. in breadth, and occupies the whole of the upper part of the north wall of the transept. It is constructed with four principal lights, the two pairs standing within sub-arches, and each pair being surrounded by a bold quatrefoil opening. The upper part of the main arch encloses wheel tracery, with six foliated divisions and a circular centre. The window is Transitional in style, and of later character than the thirteenth century windows of the nave.

Although plain and dignified in appearance, its composition is a study in itself. Immense labour having been bestowed on its details. As the chapel of the Gaunts, the building was originally dedicated to St. Mark, and that relationship is illustrated by the stained glass now introduced, as "a St. Mark window." In every part it has some bearing upon the life, work, and associations of this evangelist. The subject chosen by the donor of the re-opened nave window is that of the Ascension of our Lord.

**WINDOWS, GIRVAN PARISH CHURCH.**—Two memorial windows have been placed in the north transept of Girvan Parish Church to commemorate the ministry of the late Rev. William Corson, in

the latter years of whose incumbency the present church was erected. The windows are by Messrs. Ballantyne & Son, Edinburgh.

**WINDOW NEAR UPTON-ON-SEVERN.**—A new east window has been placed in the chapel of the Good Shepherd, Hook Common, by Captain and Mrs. Grice-Hutchinson, to the memory of the late Mrs. Attwood, of the Boynes, widow of Mr. Attwood, formerly M.P. for Birmingham. The memorial window is of three lights. The centre one represents our Lord as the Good Shepherd, and underneath is Psalm xxiii., v. 1. The light on the left shows a pilgrim guarded by an angel, and underneath are the words, "Beside the still waters," Psalm xxiii., v. 2; while the right light shows an allegorical representation of "Through the valley of the shadow of death," Psalm xxiii., v. 4. The idea for the window was supplied by the Rev. Canon Lawson, the rector of the parish, and the window has been executed by Messrs. Heaton, Butler, and Bayne.

### FOREIGN AND COLONIAL.

**FRANCE.**—The Minister of Public Works is about to inaugurate at Verjux the fine new bridge built for that town at the expense of the late M<sup>me</sup>. Bouicaut, and which has cost 700,000 francs. In the same neighbourhood a monument to this lady is to be erected, the plans of which have been prepared by M. Boileau, author of the general design for the Gambetta monument. The Société Decauville has obtained powers for four new lines of narrow gauge railway. These lines are to be from Luo-sur-Mer to Dives; from Isigny to Grandcamp; from Rocroi to Rimogne station (on the Nord railway); and from Tournay to Rihiviers. A statue to the late M<sup>me</sup>. Bouicaut, called the "Gyreneuse Baranger" has been erected at Oloron, Basses Pyrénées. There is a warm discussion as to the ultimate situation of Lemaire's statue of Du Guesclin which was in the last Salon (illustrated in the *Builder* for May 31 last). It was promised by the Government to the Department of Lozère, and is now claimed by the town of Ishardelle, where the illustrious soldier died, and by Châteaufort-neuf-de-Randon, which has a legend of his having been killed there. The Société Artistique et Littéraire, which has its headquarters at Paris, has organised an exhibition of painting and sculpture at Dinan, to open on September 21, and which will probably be of unusual interest.

A monument to General Desaix has been inaugurated at the little village of Ayat (Fuy de Dôme). It is a pyramid of white granite bearing a medallion portrait, with a palm-wreathed sword. At Milan a monument has been erected to the memory of a French electrician, Gaulard, the inventor of various electrical apparatus. The Conseil Général of the Lower Seine district has taken special measures for the protection from injury of the ancient marble table in the Salle des pas perdus at Rouen, which was connected with the "Jurisdiction des Eaux et Forêts," one of the oldest institutions in France. The small town of Roquecourbe (Département du Tarn) has shown its spirit of progress by establishing a system of complete lighting by electricity. This is not the first of the small country towns of France which are in advance of the capital in this respect. The cyclone which has visited several points in France has caused great damage. In the town of Dreux the Palais de Justice has been nearly destroyed, as well as the Collège and the ancient Episcopal Palace; and in the district of Saint Claude (Jura) several churches have been ruined. The jury of the competition opened for the re-building of the Caserne des Célestins at Paris have selected for execution the design of M. Jacques Hermant, who received the first premium. The second premium was awarded to M. Antonin Durand, the third to M. M. Bernard and Dézobaud, the fourth to M. Boag, the fifth to M. Formigé, and the sixth to M. Girault.

**DENMARK.**—There are at present being erected in Copenhagen several important official buildings. They are a new Meteorological Museum, a Polytechnic Institute, and the great Museum of Arts, in which the valuable collections from the late Christiansborg Palace are to be stored, besides which arrangements are being made for the building of a new town hall, a central fire-station, a museum of arts and industries, a national library, &c. The strike of bricklayers in Copenhagen has now terminated. A new harbour has been constructed at Frederikshavn in connection with the new railway thither. There are three basins. The cost is 125,000.

**SWEDEN.**—Herr Helgo Zettervall, chief of the Stockholm Building Board, has been commissioned to prepare designs for the new Houses of Parliament in Stockholm, the official competition failing to satisfy the jury. He has now finished his task, and published his plans, which appear to be chiefly based upon the prize drawings of last year. Herr Zettervall, however, points out that the designs may be amended in detail.

**RUSSIA.**—An interesting archaeological discovery has been made in Russia, the labourers in a quarry near Kertsch having discovered a catacomb with a number of inscriptions, emblems, and frescoes. It is in the form of a great hall cut in the rock,







## COMPETITIONS, AND CONTRACTS.

## COMPETITIONS.

Nature of Work.	By whom Advertised.	Premium.	Designs to be delivered.
New Town Hall.	Mosley Corporation.	100, 50, & 25 Guineas.	Nov. 21
New Municipal Buildings.	Gwenshaw Town Council.	500, and 200.	No date

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Re-building Church, Upper Peppleton, near York.	Rev. J. Williams.	C. Hodgson Fowler.	Sept. 2
Construction and Maintenance of Two Roads.	East Stonehouse L. B.	Barry and Cuddeon.	do.
Order Bridge over Railway.	Local Board.	J. C. Pardee.	Sept. 3
Iron Roof (160 ft. by 92 ft.).	Belmont Corporation.	Sheffield Gas Light Co.	do.
Providing and Laying Water-pipes.	Sheffield Gas Light Co.	John A. Warren.	do.
Three Shops and Dwelling-houses, Ardley, near Barnsey.	Working Men's Club, Ardley.	J. P. Kay.	do.
Water and In-take Tank, Laying Water-pipes, &c.	Lisamore Guardians.	M. R. Hyne, C.E.	do.
Unvalued Corrugated Iron Warehouse.	Swansea Harb. Trustees.	London C. C.	Sept. 4
Widening of Bridge.	Studdwick Lane Bd.	J. C. G. St. Ger.	do.
Foundations, Newbiggin Hill, nr. Penarth.	R. Heywood Thompson.	Chas. J. Ferguson.	do.
Standard with Old.	Lindley Local Board.	G. & A. H. Crowther.	do.
Sewerage Works, Woodland View.	Wortley (Sheffield) R.S.A.	Official.	do.
Water and Brick Sewer, Shilgreen.	Folehill Co-op. Land.	Amos Bandle.	Sept. 5
New Liberal Club, Coventry.	Admiralty.	County Surveyor.	Sept. 8
Alterations, &c. to Buildings at Wick.	Mr. R. Cunningham.		Sept. 8
Glazing and Re-erecting Iron Church.			
Land Works, Belfast, &c.			

## CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Alteration of Premises.	Mile End Club.		Sept. 8
Two Houses, Daisy-hill.	Chesley-le-Street Co-op. & Indus. Soc. Ltd.		do.
Ironwork of three Bridges, Thirlmere Aqueduct.	Manchester Corp.	G. H. Hill, C.E.	Sept. 9
*Pipe Sewers, &c.	Croydon Corporation.	Official.	do.
*Broken Granite.	Kidlington Local Bd.	J. R. Zech.	do.
*Par Pavings Works.	Tottenham Local Bd.	J. E. Worth.	do.
*Broken Granite.	East Ham Local Board.	W. H. Savage.	do.
*Fire Escape Staircases at Schools, Mitchen.	Colborne Union.	H. Eaton Smith.	Sept. 10
Sewerage Works, Hirswain.	Aberdare Local Board.	Official.	Sept. 11
*Making-up Carriageway and Paving Footways.	Wood Green Local Bd.	C. J. Gwynon.	Sept. 12
*Making-up Roads.	do.	do.	do.
*Cast-iron Lamp Columns.	Horsely Local Board.	T. de Conroy Maude.	Sept. 15
Iron and steel Bridge, Sutton, Scotney.	Southampton C. C.	James Robinson, C.E.	Sept. 15
New Sewers 6 miles, Will by, Chesham.	Wirtel Union, K.S.A.	C. H. Bates, C.E.	Sept. 15
*Barthenware Pipes.	Buxton Local Board.	J. Hagg.	Sept. 15
*Broken and Pipe Sewers, &c.	Smithwick Local Bd.	Harris & Harris.	Sept. 15
*Double Lane of Railway.	Coburn Dist. Ry. Co.	Warrick, Cullidge & Brand.	Sept. 20
*School Buildings.	Guildford School Board.	W. G. Lower.	Sept. 20
*Painting, &c. Works, Darenth.	Met. Asylums Board.	A. & C. Harton.	Sept. 22
*Marine Park and Lake.	Southport Corporation.	Official.	Sept. 24
New Church, Strabane, Ireland.	Wm. Hayes.	Official.	Sept. 29
New Steps at Waterloo Bridge.	London C. C.	do.	do.
*Laying-out Recreation Ground, Wapping.	do.	do.	do.
Alterations and additions to Board School, Cross Keys, Newport (Mon.).	do.	do.	do.
Villa, Hereford.	Hallifax School Board.	W. W. Robinson.	Oct. 1
Alterations and Additions to Schools.	do.	Joseph F. Walsh.	No date
Additions to Workshops, Belfast.	do.	Godfrey W. Ferguson.	do.
Three Kilns, Outhouse, and Cottage.	do.	do.	do.
Pinetel, Berwick.	do.	do.	do.
New Premises, Newcastle-on-Tyne.	Salvation Army.	W. Gilchrist Scott.	do.
Porters and Cottages, Pelling-on-Tyne.	do.	do.	do.
*Erection of Barrack Buildings, Shorncliffe.	War Department.	do.	do.

\* Those marked with an Asterisk (\*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. and vi.

## TENDERS.

(Communications for insertion under this heading must reach us not later than 12 noon on Thursdays.)

**BANGOR.**—For the erection of two houses in Bangor, Down, Ireland, for Mr. Alexander Robb Dundonald, & James Ewart, architect, 20, Rosemary-street, West. —

William Magee	£260 0 0
William Kerr	625 0 0
Niel & Finlay	550 0 0
James Fletcher, Bangor (accepted).	530 0 0

**BOW.**—For altering and adapting No. 190, Bow-road, for Mrs. Fanny Davies. Mr. J. Williams Dunford, architect, 100, Queen Victoria-street, E.C. —

F. J. Coxhead, Leytonstone.	£230 0 0
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\* Accepted.

**BRACKLEY.**—For works in connection with a new term of drainage, with fittings, &c., at the Works, Brackley, for the Guardians. Mr. Robert John Hall, architect and surveyor, Brackley. —

Claridge & Bloxham	£408 0 0
Edwin Jarvis	475 0 0
W. J. Harding	445 0 0
A. Wootton	490 0 0
W. Jenkins & Son	320 0 0

\* Accepted.

**BRIGHTON.**—For the supply of glazed stoneware pipes at Brighton for the Brighton Town Council. —

F. J. C. May, Borough Surveyor, Town-hall, Brighton.	
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Percent. below schedule prices.

4-in. 6-in. 9-in. 12-in. 15-in. 18-in.	
Hill & Sons	45 45 40 40 30 30
Coulton & Co.	45 45 40 40 30 30
Jennings, Parkington	45 45 40 40 30 30
Dorset (accepted)	45 45 40 40 30 30
Weymouth Pottery Co.	55 55 55 50 40 40
Upper Bros.	57 57 55 52 52 50

**CANTERBURY.**—For additions to Simon Langton College, Canterbury, for the Governors. Mr. G. Smith, architect, 82, Dover-street, Canterbury. —

H. Mount	£458 14 0
G. Wiltshire	400 0 0
W. Gentry	385 0 0
J. C. Slade	380 15 0
W. Cozens, Canterbury (accepted).	350 0 0

**CHESHUNT.**—For the erection of engine-house and water-shaft for the Cheshunt Local Board of Health. T. Bennett, Engineer. —

Hunt	£1,950 0 0
Kirk & Randall	1,951 0 0
Holliday & Greenwood	1,930 0 0
Jas. Dickson	1,930 0 0
Kilby & Gayford	1,638 0 0
W. Neil	1,600 0 0
J. Jackson, Enfield (accepted)	1,475 0 0
Hampton	1,433 0 0
Favey	1,427 0 0

**CROYDON.**—For the erection of stables, coach-house, living rooms in the Grant-road, Addiscombe, Croydon. Mr. Henry Gough, architect, West Croydon. —

J. Dooey	£2405 0 0
Dewdney	479 0 0
J. Saunders	450 0 0
I. Bennett	417 0 0
Smith & Bulled, Croydon (accepted)	400 0 0

**FIELD HIGHWAY.**—For construction of a new on the Outlands Estate, Enfield Highway. Messrs. T. Son, & Flint, surveyors, 11, Serle-street, Lincoln. —

Hollins	£2,066 0 0
Isszy	2,060 0 0
Jackson, Enfield (accepted)	2,055 0 0

**LEICESTER.**—For the construction of brick, iron, and stone-ware pipes, sewers, overflow weir, &c., at Leicester, for the Corporation. Mr. E. G. Mawbey, Borough Surveyor, Town Hall, Leicester. —

Monk & Newell	£2,532 7 0
W. J. Botterill & Co.	5,388 0 0
Jos. Tomlinson	5,212 18 9
J. Dickson	5,048 1 6
Holmes & King	4,380 10 10
S. & E. Bentley	4,600 11 3
E. Tempest	4,440 18 3
T. Philbrick	4,440 18 3
Jno. Band, Wincoburn (accepted)	3,940 0 0

**LONDON.**—For rebuilding and fitting-up the "George and Dragon" public-house, and also adjoining at Blackheath Hill, S.E. for Mr. W. Prangnell. Mr. T. H. Smith, architect, 17 and 18, Basinghall-street, E.C. Quantities by Mr. E. Taperell. —

H. J. Williams	£5,680 0 0
W. Smith	5,183 0 0
Holliday & Greenwood	6,079 0 0
Patman & Fotheringham	6,064 0 0
S. J. Jerrard	6,064 0 0
C. F. Kearley	5,670 0 0
H. L. Holloway	5,569 0 0
Allen & Sons	5,560 0 0

**LONDON.**—For the construction of underground tunnel, Whitechapel-road, for the Whitechapel Board of Works. Mr. W. La Riviere, Surveyor. —

Howard	£680 0 0
Little	679 0 0
Coulson Bros.	668 0 0
Katon & Co.	667 0 0
Catour	659 0 0
Finch & Co.	620 0 0
Hunt	600 0 0
Wood	583 0 0
Gladding (accepted)	516 0 0

**LONDON.**—For repairs to be done at the Licensed Victuallers' Asylum, Asylum-road, Old Kent-road, London, S.E. Mr. W. F. Potter, architect. —

Walker Bros.	£317 0 0
S. Hayworth & Sons	228 10 0
Smith & Bell	221 12 0
J. White	203 0 0
J. Ames	181 2 6
B. Cook	171 0 0
W. Wells	165 0 0
W. Wythe, Dalston (accepted)	130 0 0

**LONDON.**—For improvements to laundry, stores, &c., at the Camberwell Infirmary. Mr. R. P. Whellock, architect. —

A. Garner	£360 15 0
R. Evans	320 0 0
Young & Lonsdale	303 0 0
W. V. Good	289 0 0
F. P. Treweek (accepted)	288 0 0

**LONDON.**—For constructing Abbotsford-road, West Green, with sewers and fencing, for Mr. J. Abbott. Mr. R. J. Collier, surveyor, Finsbury-pavement. —

Thos. Adams, Kingsland (accepted)	£1,038 0 0
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**LONDON.**—For making-up, kerbing, channelling, &c. Bromley-road, Lee, for the Plumstead District Board of Works. —

Hudson	£3,200 0 0
Mowlem & Co.	3,182 0 0
Woodham & Fry (accepted)	2,976 0 0

**LONDON.**—For making-up a portion of Ivydale-road, Camberwell, for Mr. E. Yates. —

Woodham & Fry (accepted)	£394 0 0
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**LOWER GORNAL (Sedgley).**—For the erection of new schools and caretaker's house, Lower Gornal, Sedgley, for the Sedgley School Board. Mr. A. P. Brevitt, architect, Wolverhampton. —

H. Gough, Wolverhampton.	£2,740 0 0
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\* Accepted.

**MACCLESFIELD.**—For the erection of new vagrant wards at the Union Workhouse, Macclesfield, for the Guardians. Mr. John Foster, architect, Norfolk-chambers, Norfolk-street, Sheffield. Quantities by the architect. —

I. Massey	£1,850 0 0
Tom Hill	1,827 0 0
J. T. Moseley	1,820 0 0
Geo. Noylance, Water's-green.	1,785 0 0

\* Accepted.

**NEWCASTLE-ON-TYNE.**—For alterations to wards at the Workhouse, Newcastle-on-Tyne, for the Union Guardians. Mr. W. H. Dunn, architect, St. Nicholas-buildings, Newcastle-on-Tyne. —

Joseph Elliott, North Shields (accepted)	£215 0 0
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**NEW SWINDON.**—For building dwelling-house, coach-house, &c., at New Swindon, for Mr. G. Raven. Mr. R. J. Beswick, architect, Fleet-street, New Swindon. —

G. E. Henly & Co.	£272 10 0
Wm. Chambers	260 8 0
J. Ponting, Stratton, near Swindon.	555 10 6

\* Accepted.

**NUNEATON.**—For the erection of two cottages at Tuttle-hill, Nuneaton, for Mr. W. Boon. Mr. E. J. Purnell, jun., architect. —

Hallam & Co.	£250 0 0
C. Haywood, jun.	554 0 0
W. W. Wainwright	540 0 0
R. Wootton (accepted)	519 0 0

**OTLEY.**—Accepted for the supply of materials and construction of main outfall sewers, tanks, buildings, precipitation works, &c., at Otley. Messrs. Brierley & Holt, engineers, Blackburn. —

T. & W. Maston, 35, Skipton-road.	
Otley	£4,414 19 3
Jukes, Coulson, Stokes, & Co., Sheffield.	757 7 2
The Leeds Fireclay Co., Wortley, near Leeds.	502 10 10

**READING.**—For the erection of a new boat-house, near Caversham Lock, for Mr. Arthur H. East. Mr. J. Hugh Goodman, architect, Town Hall-chambers, Reading. —

Winter & Witt	£1,185 0 0
Verham, G.	1,080 0 0
Higgs & Sons	1,031 0 0
Hawkins, W.	976 0 0
Wheeler, W.	949 0 0
Taylor, D.	890 0 0
Hawley, F. (accepted)	836 10 0

**RHONDDA.**—For works in the general improvement of roads at Penygraig, Rhondda, for the Ystradgynodwg Local Board. Mr. J. W. Jones, Surveyor, Local Board Offices, Pentre Rhondda. —

Daniel Phillips	£1,019 0 1
W. Mathias	1,001 16 0
David Evans	992 13 8
Thomas Rux, Merthyr Vale.	914 18 11

\* Accepted.

**SEAFORD.**—For the erection of nine terrace houses on the Seaford Bay Estate. Mr. Thos. Moody, architect, 35, Craven-street, Strand, W.C. —

Ribbey, Berry, & Kirk, Seaford.	£3,810 0 0
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\* Accepted.

**RICHMOND (Surrey).**—For the supply of road materials. Mr. Walter Brooke, Surveyor.

*Broken Blue Guernsey Granite.*

A. & F. Manuelle	15	s. d.
J. Mowlem & Co.	16	8 per yd.
Nowell & Robson	16	6
Turner & Son	15	3
J. Paton & Son	14	10
C. Ross & Sons	14	4
E. Downs, Richmond (accepted)	14	3

*Broken Penile Stone.*

J. Runnalls, Penzance (accepted)	13	0
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*Broken Penile Stone Slings.*

J. Runnalls, Penzance (accepted)	10	9
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*Broken Brown Pit Flints.*

Hall & Co.	7	9
Wills & Packham	5	3
Eastwood & Co.	4	11
E. Downs, Richmond (accepted)	4	10
Pryer	4	8

*Broken Chalk Flints.*

Hall & Co.	6	0
Howell & Co.	4	9
E. Downs, Richmond (accepted)	4	1

**SEAFORD.**—For the erection of six terrace houses on the Seaford Bay Estate. Mr. J. W. K. Kirk, Seaford. £3,750 0 0

\* Accepted.

**SOUTH MOOR (Co. Durham).**—For sewerage and road formation works at South Moor, near Chester-le-Street, Co. Durham, for the South Moor Colliery Company, Limited. Mr. J. Wm. Rounthwaite, architect and sanitary engineer, Blackhill, Co. Durham.

Wm. McGregor	£1,750	0
George Robson	1,652	15
Jos. Goldebrogh	1,615	6
Rule Brothers & Todd	1,550	0
Thomas Dixon	1,496	0
Thos. Forster & Son, Witton Park	1,426	0
John T. Simpson	1,350	12

\* Accepted.

**STAFFORD.**—For the erection of new business premises in Greengate-street, Stafford, for Messrs. Brookfield & Windwards. Mr. Geo. Wormal, architect, Stafford.

A. F. Whitmore	£1,672	0
W. T. Woollams	1,542	0
Adams & Pemberton	1,540	0
F. Espley, Victoria-road, Stafford	1,500	0
Wm. Reynolds	1,480	0

\* Accepted.

**STAFFORD.**—For alterations, &c., to the "Curriers' Arms," Sash-street, Stafford, for Messrs. J. F. & H. S. Humby. Mr. Geo. Wormal, architect, Stafford.

A. F. Whitmore	£182	0
T. Herbert	177	0
Adams & Pemberton	173	0
F. Espley	169	15
Wm. Reynolds	165	0
W. T. Woollams, Gaoil-road, Stafford	155	0

\* Accepted.

**STARTFORTH (near Barnard Castle).**—For the erection of new police-station at Startforth, near Barnard Castle, for the Standing Joint Committee for the North Riding. Mr. Walker Stead, C.E., County Surveyor for the North Riding, Northallerton.

W. C. Atkinson, Stockton	£1,304	15
J. Kyle & Sons, Barnard Castle	1,230	0
Clark & Ward, York	1,189	4
Donaldson & Robinson, Barnard Castle	1,064	15
W. & R. Blackett, Bishop Auckland	1,063	0
Geo. Scott, Barnard Castle	1,042	5

\* Recommended for acceptance.

**STORNOWAY.**—For the erection of a new quay in the inner harbour, Stornoway, N.B., for the Stornoway Pier and Harbour Commission. Mr. Alex. Macdonald, Engineer, Stornoway, N.B.

A. & K. Macdonald	£2,318	0
John Adam & Co.	2,325	0
W. G. Fleet	2,216	10
Ross & Mackenzie	2,185	0
Forbes & MacLeod	1,799	10
James Macrae, Stornoway	1,700	0

\* Accepted.

**TUNBRIDGE WELLS.**—For the erection of a new farm-house at Bidborough, Tunbridge Wells, for Sir E. S. Hardinge, Bart. Messrs. Moore, Cawter, & Ansoll, architects, 41, Bedford-row.

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# The Builder.

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### From Australia.



THE purpose in the future to give our readers some periodical information in regard to architectural progress in the Australian Colonies, as well as to undertake some criticism as to the course of architecture in the cities of that fifth continent; still few, but increasing in size and importance, and which may have before them a great architectural future, especially when they can emerge, as the Americans are now beginning to emerge, from the mere reproducing of European types of architecture, and proceed to develop an architecture of their own; if not exactly a new style, at all events a new treatment arising out of the circumstances of climate, materials, and mode of life. We cannot say that we have seen any signs of this so far, but we have little doubt that the time will come for Australia to play her part also in contributing a fresh chapter to the history of the world's architecture. In the meantime, it will probably be of interest to our readers to have some regular information as to the present condition of architecture and of building work in the leading cities of Australia.

With this intention in view, it may not be out of place to give here a few general notes as to the country, and as to the physical and social conditions under which our Australian relatives live; otherwise English readers might fail to realise the why and the wherefore of much that we may have to record.

In the first place, this island continent is our-fifths the area of Europe, and extends from the 10°39' to the 39°11' parallels of latitude. The climate of the northern half is therefore tropical and sub-tropical, and the southern sub-tropical and temperate; but in no part, except on the highest of the southern mountains, does the average yearly temperature approach that of England in coldness. To illustrate this we give below the principal cities of Australia, and in a parallel column, well-known cities in the northern hemisphere, having about the same mean annual tempera-

ture, and also their respective latitudes north and south of the equator:—

Melbourne ... 37°52' S	Madrid ..... 40°28' N
Sydney ..... 34° 0' S	Naples ..... 40°50' N
Adelaide ..... 34°56' S	Cairo ..... 30°04' N
Perth ..... 31°50' S	Smyrna ..... 38°25' N
Brisbane ..... 27°10' S	New Orleans 30°07' N

The above are the capitals of their respective colonies, and they are all situated in the southern half of the continent.

Australia does not possess the great ranges of mountains that are so marked a feature of European scenery, but there is an elevated range of considerable width, commencing at the northern extremity of Cape York, and running parallel to the eastern and southern coast, and finally dying away near Adelaide. The highest point at Mount Kosciuszko reaches 7,308 ft., but the average is only about 3,000 ft. There are other isolated ranges dotted over the vast expanse of the continent, but they are not of sufficient height or area to materially affect climatic conditions. The consequence of this is that the narrow slip of coast-land between the mountains and the sea is well supplied with rivers, and has a good rainfall, but in the interior there is only one great river system—viz., that of the Murray, and its still more important tributary, the Darling. The greater part of central and Western Australia is, therefore, characterised by a climate of Egyptian dryness, the rainfall varying from 2 to 4 in. per annum. The monsoon rains of the tropics, however, spread over a considerable portion of the northern section of the continent, and the rain-clouds of the great southern ocean perform a like duty at the other extremity. Between these belts is one of calm, and its natural condition is drought. Variations in the position of the rain-belts of a few hundred miles are, however, of frequent occurrence, hence the frequent disastrous floods in the interior of the usually dry portion of the country. In a great part of Australia it is alternately a year of flood and then two or three of drought: in colloquial speech, it is a "feast or a famine." The rains, when they do come, are often of tropical violence, and when driven up by a southerly storm, few walls will resist their penetrating power. How best to meet the effects of great heat and driving rain is therefore a problem which materially influences the architectural treatment of Australian buildings.

We have hitherto referred only to the

mainland, but the delightful little island of Tasmania, and that England of the south, New Zealand, must not be passed over without a word of notice. The former is distinctly temperate in climate, with a good rainfall, and the two islands of the latter stretch themselves over a length of 1,100 miles, from 34°30' to the 47°30' parallels of latitude. Auckland at the northern end possesses a climate much like that of Sydney, while Dunedin and Invercargill in the south are as cold as Scotland; and the province of Otago is, in fact, appropriately populated in great measure by the hardy sons of North Britain. New Zealand is distinctly mountainous, Mount Cook in the south island reaching a height of 12,349 ft., and in the north island volcanic phenomena are of frequent occurrence. The rainfall is abundant, and an Australian drought unknown; but tempests and occasional earthquakes detract from an otherwise beautiful climate. These earthquakes render brick or stone structures undesirable in the north island, and, as there is an abundance of good timber, the buildings are mainly of wood. In the south island the same limitations do not apply, but cheapness still causes wood to be largely employed, though of late years permanent structures of brick or stone are becoming much more frequent.

The population of Australasia is very largely composed of emigrants from the British Isles, the proportion of Germans and other European nationalities being so small, except in certain special localities, as to have no influence on the marked British characteristics of the people. Much political capital is made out of the presence of a few thousands of almond-eyed Chinese, but except in the northern territory and Northern Queensland they may be ignored in any discussion of new problems. The native "black-fellow" of Australia is fast becoming extinct, and is only to be found in any numbers in the uninhabited wilds of the north and west, while in New Zealand the Maori, though semi-civilised, is nevertheless doomed. The total population of Australia amounts to over three millions, and of these the great majority are located in the mountain and coast lands of the east and south. Out of the total, New South Wales and Victoria each claim over a million; South Australia and Queensland divide the remainder between them, except a meagre 40,000 located in the



west territory of Western Australia. One very noticeable feature of the distribution of the people is the remarkable position taken by the capitals of each of the three southern colonies. It is a case of Melbourne, Sydney, and Adelaide being first and the rest of the towns nowhere. Sydney has a population of just under and Melbourne a little over 400,000, a full third of the total population of each colony. This concentration in the chief cities is an evil that may have disastrous effects in the near future unless the tendency to congestion is modified. It is an unhealthy sign in a country of unlimited material resources crying out for development. The only exceptions are Ballarat and Sandhurst, in Victoria, which have been made by gold, and Broken Hill and Newcastle, in New South Wales, whose prosperity depends respectively on silver and coal. The cause is not far to seek. Railways have so quickly followed settlement that local centres have had no chance of growth. The consequence of this is that outside the capitals there is no scope for the architect, engineer, or builder, and all the best work in the country districts is carried out from the cities. In New Zealand the same difficulties do not exist, as Auckland and Wellington in the north island and Christchurch and Dunedin in the south divide the honours, and several other towns take a good second place. They are all on the coast, and intercommunication is mainly by sea; hence every district requires its own commercial centre.

The first impression an Australian city makes on the visitor from the old country is that of airiness and spaciousness, and the next a depressing feeling of stiffness and uniformity. The former is owing to the width of the streets and the frequent reserves, and the latter to the rectangular plan on which they are nearly all laid out. Adelaide is the most striking example, and in many respects is unique. The city proper is a rectangle of one mile by a mile and a quarter, divided into four equal sections by tree-lined streets 132 ft. in width. At the crossing in the centre a large square has been formed and planted with trees and shrubs, and round it most of the public buildings are located. In the centre of each of the four sections is another smaller square; and broad streets, none less than 66 ft. in width, sub-divide each quarter. Around the city stretches a belt of park lands, one-third of a mile broad, and beyond this again are the suburbs. The plan is an ideal one, and possesses many advantages, but among the practical defects are want of diagonal communication, and a too rigid uniformity of line.

In the planning of Melbourne there is no such leading idea. The city is mainly laid out in rectangular blocks, and but for the fact of the slightly undulating surface of the central portions, and the placing of the same at an acute angle with the surrounding suburbs, the result would be very monotonous. The two chief streets, Collins-street and Bourke-street, are wide, and gently dip towards the centre of their length, so that the view, especially from near the lower end, is fine. At the upper extremity of the former stands the Treasury Building, while the new Parliament House faces the latter. Local quidnuncs would prefer them away, but those who know the value of a fine termination to a vista fully appreciate the wisdom of the Government which placed them there. There are several fine boulevards or avenues leading out of the city, or rather they will be fine when the trees are fully-grown; and some are of great width, consisting of three roadways and two footpaths separated by rows of trees. Indeed, all through Victoria, tree-planting in the streets of the towns has been carried out with great vigour, and succeeding generations will reap abundant benefit, both in comfort and beauty, from the forethought of the men of our own time. It is an unfortunate thing that in New South Wales tree-planting has been neglected, probably owing to the example of the capital, the streets of which, in comparison with those of Melbourne and Adelaide, are decidedly narrow,

and so leave barely sufficient space for traffic in the busiest portions.

It is difficult to describe the plan of Sydney. It is a growth, and is therefore more like that of an English town than any other in Australia. In the first place the city is situated on the shores of one of the most beautiful harbours the world possesses, which is indented at all points by deep bays or coves. At the head of one of these and on the banks of a small stream of fresh water the first explorers founded a settlement, and as the surrounding country was occupied bullock tracks were formed thereto and thus laid down the lines of the principal streets. As may be expected, they are neither quite straight nor perfectly parallel, but to the eye-wearied traveller fresh from the prim regularity of Adelaide and Melbourne this is no defect. As the city grew, it occupied the various points jutting out into the harbour, and with the building of the railway to Parramatta, fifteen miles inland, suburbs began to spring up thereon. Then, owing to its proximity, people began to flock over to the opposite side of the Harbour, called the North Shore, a district which promises ere long to become another city. With the extension of steamer traffic on the harbour, small settlements have been made at almost every available point, and thus it is dotted on all sides with human habitations, and in the not distant future these now separated settlements will form part of one vast city. This outlook, though it may seem sanguine, is almost certain of realisation, in consequence of the natural advantages of Sydney as a commercial port, and its position in the centre of the great coalfield of Australia, which must eventually make it the headquarters of Australian industry. In writing thus, we are fully aware of the great start Melbourne has attained in this direction by the aid of protective duties and the well-known energy of the Victorians, but in the end the great natural advantages of Sydney must operate with telling effect.

Passing north to Queensland, its capital, Brisbane, lies on each side of a comparatively small river at a distance of about twenty-five miles (by water) from Moreton Bay; and though everything has been done to foster its trade it can never rival either of the southern capitals. Queensland has several other natural outlets which will develop *pari passu* with the capital, and so prevent the latter's abnormal growth. As a city it is not very interesting, the planning on the flats being of the familiar rectangular type; and the suburbs on the hills, though pretty, have not been made the most of, many of the roads being very steep, whereas by judicious planning easy grades might have been secured. Important as this is further south, it is doubly so in a sub-tropical climate like that of Brisbane, where the saving of unnecessary exertion is a most essential point. Of most other Australian towns it is only necessary to say that the rectangular system of planning is the prevailing one, and this after a time becomes so depressing to the eye at all trained to appreciate beauty of line that any variety, however slight or accidental, is hailed with delight.

#### THE WOODS AND FORESTS LONDON PROPERTY.

**I**N a note in our issue of August 23, we set out *verbatim* the part of the report of the Committee of the House of Commons which dealt with the London property of the Woods and Forests Department. This Committee was first appointed in the session of 1889, and was re-appointed in that which has lately come to an end. The subject of the inquiry was one of much importance, but we are now concerned only with so much of it as deals with the London property of this department. It is desirable, in the first place, to clear up a popular mistake, namely, that the Crown estates, or, in other words, the estates under

the administration of the now very absurdly named department the "Woods and Forests," belong to the Sovereign. On the contrary, they are administered for the benefit of the nation, and the revenue obtained from them is paid into the National Exchequer. For the year ending March 31, 1889, the net income was 430,000*l.* The estimated realisable value of the Crown property in London is 900,000*l.* Mr. Cates, who has the management of it, states that if all the property were in hand, the annual rental would be about 1,000,000*l.* a year, as compared with the present annual rental of 250,000*l.* Thus the Crown estates form a valuable national asset, and the "unearned increment," as the phrase is, goes not into the pockets of the landlords of the country, but into those of the tax-payer. The recent inquiry thus shows that the importance of the department, so far as the metropolis is concerned, is increasing, and we think that the Committee have rightly resolved that the Commissioners should take a more responsible part in its management. But we take it that the Committee in making the recommendation in no way consider that there is any hostile criticism to be made against the management of the London property by Mr. Cates. On the contrary, it is obvious that his management has been so capable that the Commissioners have not taken more than a nominal part in looking after the Crown property in London. This is not surprising, for Mr. Cates is a person, as his professional brethren know, of great capacity and experience; whilst neither of the two Commissioners, Mr. Culley and Sir Robert Kingscote, are men of sufficient calibre or experience to overrule his views. Of course, in justice to them, it is fair to point out that a competent Surveyor of long practice is necessarily a better judge of the routine business of the management of house-property than an ordinary official can be. Thus, when a lease is about to expire, the main question is, what shall be the future rent? It is obvious that Mr. Cates is a better judge of this than most Commissioners would be. On the other hand, a Commissioner who went into these details carefully would in a comparatively short time be able to form a competent judgment on such matters as these when assisted by a skilled opinion. It appears to us that as each lease approaches its end, the amount of the future rental, the person to whom the new lease shall be offered, whether it shall be offered to the occupier or put up to public competition, should be considered by the Commissioners. It is clear, for example, from the evidence given by Mr. Cates, that a new lease of Crown premises is always offered in the first place to the occupying tenant, though he may be only the sub-tenant of the actual lessee from the Crown. But though this seems to be *prima facie* a sound general principle, it ignores the actual lessee; and we can see no reason why the actual lessee from the Crown should not have as much right to the new lease as the occupying tenant. Mr. Cates has been desirous of getting rid of the middle-man, which, again, is a sound general principle to act upon. But it is also a sound principle that the person with whom the original contract has been made has a fair right to expect that on a renewal of the lease he or his representatives will have the preference in regard to a new lease.

Mr. Cates states that in the Crown leases there is no stipulation against sub-letting. It would, he thinks, be wiser if such a clause were inserted in all future leases. Then the actual possessor of the lease, either the original lessee or his representative or his assignee, would naturally and rightly have the preference in the granting of a new lease. When sub-tenancies have been created, then we cannot but think that each case should be considered on its merits, and that the occupier or sub-lessee should not *prima facie* be considered as having a greater right than the lessee or his representatives. A very important question is also raised by the Committee—as to whether a scheme of periodic renewals to anticipate the closing of the lease



in its natural course and then gradually to raise the Crown income should not be established. They consider that this point should "be carefully considered by the Commissioners." It is difficult to understand why the Committee do not themselves give a definite opinion upon it. It is a subject, indeed, rather for the Chancellor of the Exchequer than for the Commissioners, who are only managers of this property. It concerns the national finances, and it is a point which should be settled by the responsible Finance Minister of the country, the details being worked out by the Commissioners with professional advice. That a scheme of renewal on a proper basis would be desirable we cannot doubt. It would prevent any question as to the person to whom a new lease should be offered, since the privilege of renewal would necessarily belong to the lessee alone, and it would enable the value in the improvement of the Crown property to be more certainly estimated for revenue purposes, and to come earlier into the public exchequer. It would also give a greater security of tenure to leaseholders of the Crown. The latter would, in fact, have perpetual tenancies, subject to the performance of the conditions in their leases and to the payment of certain fines or increased rents, which would be known from the very moment that they became lessees of the Crown. We believe that such practice exists on Lord Derby's Liverpool estate, though it does not seem to be the same on the London estates of the great landlords. Mr. Cates's practice is to arrange the terms of a new lease with the occupying tenant "about a year before the expiring of the lease." This gives the lessee or the tenant too insecure a tenure. The latter, it is obvious, does not know, until a short time before he may be turned out, on what terms he may remain in; and the former, whether he likes it or not, has to give up his interest. Crown leaseholds should, as nearly as possible, have the attributes of freehold property, and to give it these a scheme of renewals must be in force. If a tenant, when such a scheme exists, does not care to make use of it, he has no one to thank but himself.

#### THE PRINCIPLES OF PROPORTION AS PRACTICALLY EMPLOYED IN THE PARTHENON.\*

BY W. WATKINS LLOYD, F.S.A.

It will be observed that the open space between the columns of nearly 8 ft. is so ample relatively to human dimensions as to give no suggestion of inconvenient narrowness for two persons entering together.

The columns of the pronaos are smaller than those of the peristyle, and their columniations are also somewhat closer (13.736 : 14.090). The consequence is that each ranges somewhat nearer to the axis of the plan than the peristyle column, which is partly in front of it. The difference is exaggerated at the angles from the close spacing of the columns of the peristyle by the angle both front and flank; this has the happy effect of giving greater openness to the ambulatory at the corners, and allowing an uninterrupted passage of light through the second columniations on front and on flank.

The columns of the pronaos compare with those of the peristyle very nearly in the proportion of 6 : 7 by diameters. 7 : 6 :: 6.245 : 5.352—cf. 5.402 measured. This is a pair of numbers, of which the squares also approach a simple proportion, viz. (49 : 36) 4 : 3. If we square the diameter of the peristyle column we have 39.0, which by ratio 4 : 3 gives 29.25 for the square of the diameter of the pronaos column, and the root of this number 5.408 is still nearer to the measurement than the result obtained by direct comparison of diameters.

The like comparisons worked out between

the west peristyle and posticum columns give us:—

Diameters 10 : 9 :: 6.251 : 5.626; cf. 5.632 measured.

Areas 5 : 4 :: (6.251<sup>2</sup> =) 39.07 : 31.256 (= 5.590<sup>2</sup>).

In this case, therefore, the exacter result is given by ratio of diameters.

The platform of the cella with its two porticos has the proportion of breadth to length of 7 : 19.

Of this oblong an exact square is assigned to the Posticum, Opisthodomus and partition wall.

71.330 : 71.334 by Penrose's independent measurements.

The remaining rectangle has consequently the proportion of 7 : 12 comprising the naos and pronaos; this is the proportion of the front of the temple from level of stylobate to apex of pediment.

The plan of the naos in the interior, the chief and most sacred apartment, has very exactly indeed the proportion 9 : 14, or the same which, as we shall see, obtains between the breadth and full height of the front.

9 : 14 :: 63.010 : 98.015 (cf. 98.095 measured).

The hundred Attic feet which justified the title 'Hecatompedon' as applicable specially to the naos, extend to midway of the front wall,—the line, in fact, of the doors. In consequence, if the façade of the temple were drawn to scale and laid down on the plan of the naos, its bounding lines would be exactly contained within the flank and end walls of the naos.

The nearest, but by no means satisfactory approach of the interior of the opisthodomus to a simple proportion is, 11 : 16.

16 : 11 :: 63.01 : 43.318 (cf. 43.767 measured).

The naos column is in proportion to that of peristyle as 7 : 12 by diameters, and to its inter-column as 3 : 4.

The aisles taken jointly and upon the centre line of the columns give a dimension comparing with breadth of naos as 3 : 4.

The coincidences of proportion were, of course, no matter of mechanical deduction, necessary consequences from foregone assumptions; they were, doubtless, conclusions obtained after a series of trials and adjustments conducted only under guidance of the principle to search for special proportions compatible with available and appropriate arrangements.

By the established Doric system a triglyph was to be placed exactly central over each joint of the architrave stones, and between each pair of these, another intermediately. But if equal spacing were observed rigidly, the architrave must finish at either end with a half triglyph, and the architrave stones would only extend as far as the centre of abacus of the columns at the angle. It was probably to escape this anomaly that the angle columniations were first contracted and the angle column brought entirely under the architrave stone, though some advantage in effect must have been recognized in this departure from uniformity, otherwise we cannot doubt that a different solution of the difficulty would have been found. The architects, however, elected to allow the anomaly of finishing the architrave with a complete triglyph, which did not in this case centre with the axis of the column beneath it. But the further consequence now ensued that the extra half triglyph admitted on the architrave would pinch the space for the adjacent metopes. This difficulty was got over or alleviated by the angle architrave stone encroaching on its neighbour and extending beyond the axis of the second column, and so the irregularity was distributed and dispersed.

On the east front of the Parthenon the lengths of the architrave stones are:—

15.227—13.966—13.389—14.210—14.126—  
13.617—15.260—

The metopes:—

4.160—4.063—4.064—4.050—4.232—4.295—

4.320—4.375—4.169—4.186—4.195—4.192—4.120—  
4.121 S.E. (Penrose, p. 16).

As a triglyph is placed very accurately over

the centre line of each of the intermediate architrave stones, the metopes fall into pairs which are very accurately of the same breadth: 4.282, 4.295; 4.195, 4.192, &c.

The central east architrave stone gives the widest pair, 4.320, 4.375; the pairs of architrave stones on either side are somewhat shortened to accommodate the anomaly of the extra half triglyph on the terminal architrave stones, and the breadths of the several pairs of metopes are more or less reduced in consequence.

Apart from these subordinate variations, the average proportion of the breadth of the triglyph to that of metope is 2 : 3.

The full length of the frieze on east front allowing for slight setting back from the architrave (0.067 × 2 = 0.134) is 100.161 to accommodate 14 metopes and 15 triglyphs, and in view of the given proportion divisible into 72 aliquots—

$$\frac{14 \times 3 = 42}{15 \times 2 = 30} \div 72 = 1.390$$

1.390 × 2 = 2.780 for triglyph comp. { N.E. 2.786  
pairs with { S.E. 4.765  
1.390 × 3 = 4.170 for metope, comp. { N.E. 4.192  
pairs with { S.E. 4.126

The metopes towards the centre measure 4.330, 4.282, &c., by excess over calculation, which is compensated for by reductions above the shorter architrave stones towards the sides, 4.064, 4.066, &c.

At the south angle of the east front, the space between the two super-columnar triglyphs is, as in most other cases, accurately divided by the inter-columnar triglyph, making the metopes on either side equal; but at the north angle there is a difference. This is due to the second architrave stone being shortened, to the advantage of the third. The contrasted dimensions are these:—

S.E. 15.227—13.966—13.689—14.210.  
N.E. 15.260—13.617—14.126.

The metopes are so reduced above the short architrave stone that the slant face of the southern half triglyph had to be cut away to make room for the sculpture.

Had the last inter-columnar triglyph been set quite symmetrically, it would have given metopes of uniform breadth, 4.129, to compare with the corresponding metopes at the other angle, 4.126 and 4.120. But the architect preferred an unequal division, which made the southern metope just equal to those above the short architrave, viz., 4.066. This leaves 4.192 for the last metope, which compares with the breadth of the corner metope very nearly as 3 : 2.

3 : 2 :: 4.192 : 2.794 (cf. 2.786 measured).

It seems clear that the architect, having to deal with an inevitable irregularity in disposing of the terminal half-triglyph, contrived to distribute it, and in doing so deliberately avoided giving emphasis to rigid uniformity in parts adjacent. As we have seen, he did not deal with the difficulty exactly in the same way at both extremities of the frieze. It was probably due to like considerations that he allowed more irregularity in the columniations by the angles than to any others. Perfect uniformity throughout was excluded by the nature of the case, and the want of it was in some degree concealed by the departure from uniformity, though under strict limitations as we shall see, not being exactly repeated or so concentrated as to declare itself by direct contrast with the uniform.

It is worthy of remark that the breadth of the triglyph compares with the lower diameter of the peristyle column in the ratio, so frequently employed in the Parthenon of 4 : 9.

9 : 6.25 :: 4 : 2.770 (cf. 2.776 measured).

This may possibly be a coincidence which was never weighed or recognised; but the two dimensions are very naturally compared, and the recognition of their proportion so favourably, may quite as probably have had its influence in deciding the precise proportion of triglyph to metope which conciliated it.

We have now gone through a consideration of the chief elements of the design and its distribution, which concern or are in direct dependence on the ichnography of the temple,

\* The first part of this paper, with a number of illustrations, appeared in last week's *Builder*.



to the plan and distribution of the plan. It remains to treat of the orthography,—that is to say, of the elevation of the temple and the proportions which the architect assigned to its component parts.

The accepted laws of the style determined that the columns of the portico were to stand upon a basement of some solidity, and to support an entablature consisting of architrave, frieze, and cornice; the entablature in its turn being crowned by a low triangular pediment, with its own cornice following the raking outline.

The chief contrast, the dominant antithesis in this combination, is between the vertical and horizontal members; that is, between the upright column and the laterally extended hypostylia and epistylia.

It will be seen that there is a distinct analogy between this relation and that between the solid columns and the void interval of intercolumn, which we have already found to be subject to a regulative proportion.

The first comparison to be instituted is, therefore, between the height of the column and the joint height of the horizontal members as another term. The expression of the architecture depends as importantly on the closeness of the interval between entablature and basement, relatively to their mass, as on that of the void interval of the columns relatively to their girth.

There is some appearance that in the earlier Parthenon the diameter of the column exceeded the inter-column, but in the later temple this is only the case with intercolumns and columns by the angles of the peristyle. Otherwise both on front and flank the superior breadth of the inter-column as five to the diameter of the column where it is greatest as four, throws the balance in favour of a sense of inviting admittance, above that of exclusion. And so we find that, in accordance with the analogy between the cases, it became a canon with the Athenian architects to throw the balance, even in their most majestic buildings, in favour of lightness as against solidity,—that is, to assign a larger proportion of the total height of a façade or pedimented portico, to the vertical member, to the column which gives the measure of the interval between epistylia and hypostylia. Consistently with this principle, the increased proportion of height given to the column in various buildings of fine style, was correlative to an increase of openness in the spacing of the columns.

We have already accepted the full height of the front as 65.185 measured; of this 34.253 is given to the column, and this dimension compared with the complement 30.932 available for joint height of the horizontal members, is in the proportion 10:9—

$$\begin{array}{l} 10:9::34.253\text{ (cf. 34.253 measured)} \\ :30.932\text{ (cf. 30.932 measured).} \end{array}$$

$$\begin{array}{l} 65.185:19=34.308 \left\{ \begin{array}{l} \times 10 = 34.308 \\ \times 9 = 30.877 \end{array} \right. \\ \hline 65.185 \end{array}$$

In this proportion, 9:10, we have an example of a further extension of the canon. It is, that not only shall the height of the column be the superior term, but that the ratio adopted shall always be a super-particular ratio,—a ratio of that simplest form which has a difference between its terms, of unity. At Sunium the ratio is 7:8; at Bassae, 6:7; at Rhamnus, 5:6; in the Theseum, 4:5.

All these are Doric temples, and the successive ratios indicate progressive lightness or openness of composition. In the Ionic temples this progressive development is naturally carried further, through the ratios 3:4, 2:3, and, finally, 1:2, which is the limit, when the height of the column is just double the complementary joint height of the upper and lower horizontal members.

When still even this degree of lightness did not satisfy the Ionic architect, he resorted to an artifice which gave him further licence while plausibly conserving adherence to the canon; he reckoned the shallow base and capital of the Ionic column as pertaining to

the horizontal members, and made the shaft of his column alone double that of this enhanced complement.

It was a further canon of the Athenian architects, confirmed by a number of comparisons, that the height of the column should not only satisfy these conditions in rectilinear proportion, but that it should also fall in with a rectangular proportion in the very simplest form by agreement with a definite spacing on plan; that is to say, the height of column proves to give a dimension which accurately measures off an interval on plan of the colonnade, of which the terminal points coincide with the margin of diameter or with the centre of plans of the columns. In some cases an option is accepted of taking the angle column and adjacent contracted columniation into the comparison. This is the case both at Bassae and Rhamnus, where the symmetry extends from the angle column inclusive to the centre of the third column. In the Theseum a like symmetry holds good, only taken upon the plan of interior columns exclusively. At Sunium the rectangular symmetry includes the full diameters of three interior columns and their two intercolumns. This also is the scheme which is recognisable in the Parthenon as a distinctly controlling relation.

The extent of three diameters and two intercolumns measured on the east front averages 34.443, which nearly agrees with the height of the middle columns, if, with Mr. Penrose, we include the curvature increment above the level line joining the angles of the steps (p. 13),  $34.253 + 0.225 = 34.478$  (error =  $\frac{1}{2}$  in.).

The height of the column at the angle is, however, the term adopted in relation to the general division of heights of members.

Again, it appears to be so frequent a usage in Doric architecture as almost to attain to the strictness of a canon, that the breadth of the abacus of the column should have either a rectangular proportion of one-fifth to the height of the column, or a rectilinear proportion to the breadth of the top step, or both.

The Theseum abacus is one-fifth of the height of the column, and one-twelfth of the top step; at Bassae the abacus is again one-fifth of the height of the column, but it is not commensurable with the top step. In the Parthenon the broader abacus of the angle column on the east, is one-fifth of its height; the smaller ordinary abacus of the same front is one-fifteenth of the top step; that is to say, its breadth is obtained by dividing that of the top step by the joint number of the eight columns and their seven intercolumns.

On the west front and south flank, a different and reduced breadth is adopted for the ordinary abacus, obtained by giving it a proportion of seven to eight to the inter-abacal space.

On the north flank the width of the abacus is curiously varied; they diminish from the east where they adjoin to the largest examples towards the west front, where they are smaller. Nothing could have been more simple than for the masons to turn out any number of these square blocks exactly equal in size; we must therefore assume that these variations, controlled as they appear to be by a certain method, were deliberately adopted with all the extra trouble they entailed, for the sake of precluding, though by an artifice which would escape the keenest observer, the dryness of pure repetition of absolute uniformity.

The height of the shaft of the column equals lower diameter  $6.251 \times 5$  plus 0.168, or just 2 in. ( $31.423 \div 5 = 6.284$  cf. 6.251 measured). The agreement is near enough to be noted though scarcely to be insisted on.

The leading principles in the proportioning of the entablature seem to have been that the soffit of the architrave should exceed, and its height be less than, the upper diameter of the column; that the frieze should be equal in height to the architrave; and that the height of the entablature, including cornice, should somewhat exceed the free interval between columns at their upper diameters.

These conditions are effected in the Par-

thenon by giving a height to the cornice on the fronts of 10.793 ( $1.951 + 4.417 + 4.425$ ), which conciliates a very remarkable and important proportion.

The height from the top step to the line of cornice, which is thus completed, is 45.046, which compares with the breadth of top step exactly in the same ratio 4:9 as the top step to the same on flank.

$$9:4::101.341:45.0426\text{ (cf. measured 45.046).}$$

We have, therefore, the continued proportion; as the length of the flank of the platform is to its breadth so is that breadth to the height of the order erected upon it. We may hand over to the theorists of the doctrine of probabilities to compute the chances of this significant coincidence within such a relatively minute quantity 0.0034, occurring by chance.

As regards the entablature itself, the soffit of the architrave exceeds the upper diameter of the column in the ratio 6:5 (4.883:5.859—cf. 5.845 measured).

The mean height of frieze and architrave, 4.421, compares with the upper diameter of the column nearly in the ratio 9:10.

$$9:4.421::10:4.901\text{ (cf. 4.833 measured).}$$

The full height of the entablature equals as just one-third of the extent on plan of the three columns by the angle with the included intercolumns.

$$32.439 + 3 = 10.813\text{ (cf. 10.793 measured).}$$

Thus each column is responsible for an exact rectangle of entablature.

The determination of the upper diameter of the column will be considered with the scheme of proportion of the column generally.

The proportion of 4:9 has still a further continuous application with a slight modification. By adding to the height of the order the fillet of the cornice of the pediment which is returned along the flank, we obtain the dimension 45.102, which compares with the complement of height, that is, heights of pediments and steps jointly, in the stated ratio.

$$9:4::45.102:20.045\text{ (cf. 20.131 measured).}$$

The same addition to the cornice brings it up on the flank to half the height of the frieze, —with which independently of this it compares closely in the proportion 4:9.

$$9:4::4.417:1.963\text{ (cf. 1.951 measured).}$$

What is of more importance to remark is that the height which is assigned to the steps, 6.058, makes up with the flank entablature, including this slightly-enhanced flank cornice, very nearly half the height of the column:  $17.140 \times 2 = 34.280$  (cf.  $6.058 + 11.082 = 17.140$  measured), or  $34.253 \div 2 = 17.126$  to compare with 17.140 measured. The height of the steps so obtained or accepted comes out with proportion to the entablature of 6:11.

$$11:6::11.092:6.050\text{ (cf. 6.058 measured).}$$

In the prosecution of this analysis the principle has been kept in view—in submission, I may say, to a suggestion of my late friend Professor Cockerell—to follow out a process of development from superior to subordinate dimensions, to deduce, so to speak, the branches from the trunk, to decide the dimensions in the first instance, which may seem to have necessarily limited the ulterior subdivisions. But it is not to be supposed that we can in this way assure ourselves that we are following the process of the designer. So far as we have gone no reason has appeared why the design might not have been settled up to the top of the cornice by a consistent scheme of proportional division without regard to the pediment or consideration of the height to be assigned to it. But that height decides itself, and becomes a condition anterior, within narrow limits, when once the breadth of the temple is decided on. The rise which is given to its raking lines is about 1 in 25, and this is so nearly the constant rule in the roofs of the Athenian Doric structures, that we must assume that the height of the Parthenon pediment was decided by it approximately, when once the 100 ft. of the top step was decided. The rule was not so



rigid as to enforce absolute precision, and absolute height would also be liable to be affected by the degree of projection allowed to the cornice at the angles from which the slope line of the corona started, and then by the optional height which might be given to the corona; but these differences would be slight variations of a total height which could not be less than between 13 and 14 ft.

We are, therefore, bound to admit that while the architect sat down to design his front upon the absolute basis of a breadth of 101.341 ft., he had the second condition to bear in mind in adjusting his proportions that they must be such as to allow for a pediment only variable within narrow limits of height. What he worked for was to realise a temple having its specific character of dignity by well-selected proportions of parts in accordance with the general character prescribed by the norm of the Doric style. It is but a conjecture, but it is plausibly conceivable, that in the tentative processes of embodying his ideal, he followed out first the suggestions which were presented by regarding chiefly the condition of an assumed height of pediment, and then in turn by the independent ordination of columns of various proportions, until he was satisfied by hitting on those combinations which so happily conciliate both processes and form a plexus of harmonies of which the artifices defy attempts to unravel.

The dimension which is left over for us for the height of the pediment by the analysis adopted, is about 13.97, and the measured is 14.073. This dimension agrees with the second columniation of the front south-east 14.073, and with the third south-west 14.084. At the same time it completes a total height of front which gives the proportion to top step, as we have seen, of 9:14; and a height from the top step to the same of 7:12.

Cornice and tympanum have a relation of solid and void analogous to that between column and intercolumn, and a certain harmony of gradation results from the similar dimension being distributed in contrasted proportions.

The vertical height of the cornice of the pediment at the apex compares with the horizontal cornice in the ratio of 4:3.

4:3 :: 2.601 : 1.950 (cf. 1.953 measured).

The breadth of the south-east angle abacus is 6.857, and height 1.150, this is more than one-sixth; and the shorter examples are many of them higher; at the same time the sixth of the angle abacus approaches the average height of the abacus generally—

6.857 ÷ 6 = 1.143 (cf. 1.149 "F. C. P.," p. 15).

The height of the capital varies little for angle and ordinary columns. It is given by the ratio of 4:9 to the diameter of the angle column.

9:6.878 :: 4:2.834 (cf. 2.833 measured).

Penrose's plate 14 gives 2.810 as height of capital of the northern of two central columns, east front, of which abacus takes 1.145, echinus and necking 1.675.

The approach to the ratio 2:3 is not close enough to be relied on.

It is pointed out by Mr. Penrose (p. 15) that the upper diameter of the column is proportioned to breadth of the abacus in the ratio 13:18; these are high numbers, and the agreement may be a coincidence; but the proportion is in the normal series of ratios with difference of 5, and may have been welcome in addition to other determining considerations.

13:18 :: 6.756 : 4.88 (cf. measured upper diam. 4.883).

Mr. Penrose also notes (*ibid.*) that the diminution of the column which gives the upper diameter, is at the east end .683 and at the west .685, which is exactly  $(34.253 \div 50)$  1.50th of the height of the column.

Of the south-east angle column the diameters are—

Lower diam. .... 6.378\* = 40.68  
Upper diam. .... 4.989\* = 24.89  
Diam. of echinus. ... 6.733\* = 45.33

The upper and lower diameters compare directly as 11:14, but the corresponding sectional areas which are as the squares of these

diameters, give very exactly the normal ratio 8:13.

The sectional areas of upper diameter and echinus come out very exactly in the ratio 9:10.

The lower diameter of the column of the pronaos is derived from that of the ordinary column east front, either by ratio of diameter—

7:6 (6.245 : 5.352 cf. 5.402 measured).

Or more exactly by ratio 4:3 of sectional areas.

4:3 :: 39 (=6.245\*) : 29.25 (=5.408\*).

The diameter which is given for the naos column compares with that of the pronaos, by diam. as 2:3, and therefore by sectional area as 4:9; but much more exactly with the peristyle column by diameter as 7:12, a normal of Parthenon.

12:7 :: 6.245 : 3.643 (cf. 3.656 measured).

The naos column is proportioned to its inter-column as 3:4.

It may be noticed here that the due subordination of the Propylaea to the Parthenon columns, is effected by giving them a diameter in the ratio of 9:11, or sectional areas proportioned very nearly as 2:3.

3:2.9 (=6.245\*) :: 2:2.6 (=5.098\*).

11:6.245 :: 9:5.109 (cf. 5.110 measured).

The small Doric column of the Propylaea is proportioned to the larger by as 11:16 by diameters.

16:5.11 :: 11:3.513 (cf. 3.516 measured).

We have now reviewed the chief proportions of this supreme achievement of Hellenic architectural genius, the Parthenon. In looking back through our comparisons it will be observed that the architect confined himself to a remarkably restricted scale of well-distinguished consecutive ratios; that he employed the same ratio over and over again, now upon one scale of dimension, now on another, rectangularly or rectilinearly, or by area; now in erect presentation and now horizontally.

By manipulation of these ratios he effected a gradation of masses sufficiently decisive but without suddenness, between the columns of the peristyle, those of the inner porticoes, and those of the naos, enhancing the dignity of the superior without degrading the subordinate. The gradation of intervals is ordered with equal art and effectiveness.

The projection of the two broad steps and the offset below them is to the diameter of the column as 4:5—that is, it has the same proportion to the diameter as the diameter has to the inter-column, and is subordinated to the interval of the columns accordingly.

5:4 :: 6.245 (diam. of col.) : 4.990 (cf. 4.974 projection of steps).

The inter-column is then subordinated to the interval between peristyle column and cella wall by the ratio 7:8.

8:7 :: 8.945 : 7.825 (cf. measured inter-col. 7.829, &c.).

The breadth of the ambulatory on flank from edge of step to cella wall is in turn subordinated to like breadth on eastern front taken to the edge of pronaos step, in proportion of 7:8; and this breadth on the east front, from edge of top step to the step of the pronaos is subordinated to the dimension thence to naos wall in the ratio 5:6.

6:5 :: 19.04 :: 15.867 (cf. measured 15.878.)

In this manner we are conducted with a sense of constantly expanding room to the spacious interior of the naos.

The posticum is in general plan identical with the pronaos; but the slightly larger columns bring their intervals more near to equality with those of the peristyle, and the space from the cross wall to the top step is here equally divided by the step of the posticum.

Here we have still one more, and a very decisive, example of how the architect made it a principle to introduce an element of diversity between similars, and yet always in subjection to a new scheme of definite proportion.

I may say, in conclusion, that the confident

assertion that we have here a true recovery of the principles, and it may be added the practice, of the Greek architecture, depends on the propriety of the selection of the members and dimensions which are brought into proportional relation, on the universality of the application of proportional regulation, on the simplicity of the select scale of proportions which is employed; and lastly, on the extraordinary accuracy with which the proportionate dimensions are put into execution.

Furthermore, it may be recommended to those who, after testing the calculations here provided, may be disposed to fancy that such appropriate and such precise proportions may be mere fortuitous coincidences, to examine for themselves the numerous Sicilian temples. Whatever may be the system on which the design of these was regulated, they exhibit but the very slightest and rarest approaches to such systematic proportions as we have traced in the Parthenon; yet these could not have been so abundant in the Athenian temples, and so all but entirely wanting in the Sicilian if it were in the nature of things for them to crop up, to develop themselves spontaneously.

W. WATKISS LLOYD.

#### NOTES.

**T**HE report on the proceedings of the Board of Trade under section 24 of the Railway and Canal Traffic Act has just been published, and contains much that is interesting and instructive. The Commissioners express their belief that the classifications and schedules which they have prepared are such as will protect the interests both of the traders and the railway companies, and they give their reasons for adopting or rejecting the different courses which were suggested with regard to the various points upon which they had to decide. They found it absolutely impossible to ascertain the cost of carriage of the different classes of goods, and have had to fall back upon existing maximum rates as modified by the actual charges in force, for a basis upon which to form their own proposals. It will be a matter of surprise to many,—as it probably was to the Commissioners themselves,—to learn the extent to which "special" rates, as distinct from the ordinary class rates, have been granted. It is stated that on the Great Western Railway the proportion is half special and half class; on the Midland, 75 per cent. special and 25 per cent. class; on the Great Eastern, 55 per cent. special; on the London and North-Western, 73 per cent. special; on the North-Eastern, 61 per cent. special. The Commissioners remark that the Railway Companies have built up a traffic remunerative to themselves at rates, generally speaking, much lower than those at present authorised by Parliament, and, consequently, they came to the conclusion that "it is equitable to make a reduction in their present powers and to fix rates based, to a great extent, on existing rates, but with a reasonable margin of profit for possible changes of circumstances injuriously affecting the cost of or the returns from the carriage." The report, as a whole, is distinctly on the side of the traders, and, as the *Times* observes, the companies will find in the Board of Trade a new and formidable opponent should they persist in objecting to the proposed terms, and thus force the matter upon the attention of a Parliamentary Committee.

**T**HE reports of the proceedings of the Trade Union Congress seem to become every year more and more melancholy reading; a mingling of absurd and Utopian aspirations for legislation in which everything shall be in favour of the working-man, coupled with displays of temper, personalities, and violent language which serve to indicate how far those who indulge in them would be fitted for the legislative responsibilities which they crave. The Parliamentary Committee, which consists of reasonable and logical men, is



attacked for not bringing in Bills for objects which every rational man knows they would not have a chance of obtaining a hearing for. One member of the Congress proposes that a general conference of labour associations should be called to consider the best method for payment of members of Parliament; another, amid "much uproar," moves that no labour candidate should receive support "unless he were in favour of the nationalisation of land, shipping, and railways!" And the same men who are crying out for these wild schemes are proposing to increase their own and the national prosperity by arbitrarily limiting the hours of productive labour!

IT appears that the unsatisfactory condition of affairs in the Tyne ship-building trade, to which we alluded on the 9th ult., still continues, and that nearly 1,000 men are now on strike. The dispute is one of unusual occurrence, as it is a struggle between two bodies of workmen, and one in which the employers occupy a passive and neutral position. Unfortunately for the latter, however, they are obliged to stand by and see orders going out of the district owing to the delay which the strike has occasioned in the completion of vessels. It will be remembered that the dispute turns upon the apportionment of the work which shipwrights (or carpenters) and ship-joiners are respectively entitled to do; and that Mr. Burt (who had been appointed arbitrator) gave an award which the joiners refuse to accept. Their action in thus repudiating the award and coming out on strike has naturally had the effect of alienating public sympathy, and it has, at the same time, probably opened the door to the shipwrights getting hold of work which is acknowledged to belong to the joiners' list. If this has occurred, however, it is clearly the strikers' own fault, and the Trades' Council of the District have just passed a formal resolution "withholding sympathy from any body of men who dissent from the award of a regularly-appointed umpire." It was the singularity of the dispute which led us to allude to it at the outset, but it appears to be as far off settlement as ever, and to have assumed a much more serious aspect than was anticipated. The latest advices from the district state that the Wear joiners have now decided to support their Tyneside fellows, and that it is not unlikely that the whole shipbuilding trade of the North may be brought to a standstill unless the other Unions affected speedily take the matter in hand and endeavour to bring about a settlement.

IN opening the new Museum of Science and Art and the National Library, Dublin, on the 29th ult., the Lord Lieutenant observed that he had noticed with pleasure what good use Irish workmen had made of the excellent Irish stone and marble of which that edifice is composed. "I sincerely trust," he said, "that the durability and beauty of these native products may be more largely recognised in the future, and, in consequence of increasing demands for them, important industries may be established on a sound footing in several parts of the country where hitherto there has been insufficiency of work to employ the population." This remark entirely coincides with the views that we have frequently expressed in these columns. No matter how poor Ireland may be in respect of other mineral wealth, there can be no question as to the richness of the country from a stone- and marble-producing point of view; yet its resources in these respects are comparatively neglected, owing chiefly to want of capital. Beautiful marbles, that could be very cheaply raised and worked, and immense tracts of granite (that of Wicklow and Wexford is the largest granite *massif* in the kingdom) lying both along the shore, within easy reach of carriage, and inland, are as yet untouched, save here and there by the opening of a solitary quarry for local purposes. The Carboniferous limestone of which the greater part of the country is composed yields

durable building stone of many tints, and with a little expenditure of capital and proper introduction could, in many instances, be brought to successfully compete with other better-known kinds in the market. We feel sure that the Lord Lieutenant's hopes will some day be fully realised.

THE recent report of the Foreign Office on Emigration to the Argentine Republic is another of the very useful series which that Department now issues. It gives in a short space many useful hints to intending emigrants. Argentina is one of the finest and most promising countries in the world, but that is no reason why emigrants should rush there in an indiscriminate manner. But it is obvious that the greatest drawback to English emigrants is the desirability of knowing the Spanish language. In 1889, 5,967 English emigrants landed in Argentina, against 88,647 Italians, 71,161 Spanish, and 27,173 French. Thus, it is equally clear that a knowledge of Italian would also be desirable. But, all the same, there is a sufficient English element in the Republic to enable an Englishman of the right sort to make his way. "Navies without out families are sure to get immediate employment." This should be good news in this country, where railways have now been pretty well completed. "For surveyors and engineers, lucrative employment offers. . . Architects, builders, and experienced contractors, with means, will find competition not as keen as in other parts." It is also stated that "all immigrants are landed, lodged for five days, and sent to any part of the Republic they may select free of expense." But, of course, they should have formed before-hand an idea of the part they desire to settle in. The English immigration clerk at Rosario also states that "there is always employment in the larger towns for the artisan handicraftsmen, more especially for carpenters, masons, shoemakers." This is exactly what one would expect to hear from a growing country. But the English mason has to compete with excellent workmen in the Italian emigrants. The same gentleman gives as the rate of pay for carpenters three to seven dollars per day, for painters two to four, for masons five to eight, and bricklayers two to four dollars. Account, of course, must be taken of the value of paper money, but it does not affect men much who are not remitting money home. The fine climate is a great advantage, especially in the case of masons and bricklayers, who are thus pretty sure of continuous employment.

A WRITER in the *Times* last week drew attention to the fact that the Western Australian strike was that of workmen earning very high wages, and he draws the moral that poverty is not necessarily a motive-force of strikes. The letter was well-timed, but it only expresses what most thinking men have already perceived, that once trades unions became very powerful, strikes would occur, not in order to obtain wages upon which men could live reasonably well, but upon which they would be able to obtain more than the mere necessities of life. It is contrary to all the teachings of history, and to all the experience of mankind, that power in the hands of the masses should be used with moderation when distinct personal advantage can be gained by its arbitrary employment. It is perfectly obvious that the labour-question has yet to undergo much greater developments, and he would be a bold man who would venture to prognosticate the course of the struggle between capital and labour. The subject is one which cannot be too carefully and seriously studied, more especially as everything seems to show that the struggle must yet become more severe. There may yet come a time when communities will not only have to bear the burden of taxation, but also of high charges caused by the arbitrary power of organised labour.

A RECENT addition to the Illustrated Biographies of Great Artists is the two small volumes containing the lives of

Millet, Rousseau, Diaz, Corot, Daubigny, and Dupré. These artists are classed together as "The Painters of Barbizon," or, as appears at the head of each page, "The Barbizon School." Another work on these same painters has also appeared this year, by Mr. D. C. Thomson, "The Barbizon School of Painting." This loose way of grouping these painters as one school is very characteristic of a good deal of the art criticism of the present day, which uses inaccurate phrases which sound well. A "school" of painters is one which is characterised by certain marked similarities; and by classing certain artists together as a particular "school" the student at once is able to recall at any moment the cardinal features of their work. But the painters who compose the so-called "school" of Barbizon have no common characteristics. They passed part of their lives in the same picturesque village, and that is all. Rousseau, for example, was a great landscape-painter, with nothing akin in his work to the peculiar treatment of Millet's pictures. It would be just as sensible to class the artists who live near each other in a particular part of Kensington as the "Campden Hill School." We call attention to this loose way of writing of these artists, because artistic criticism, if it is to be of any value at all, should be thoroughly accurate. It is perhaps, indeed, using somewhat inaccurate phraseology ourselves to call these popular biographies art criticisms, for they are not real criticisms in any sense of the word. They are handbooks which may well be used as aids to memory, but they are very valueless for any higher purpose.

A WELL-KNOWN bookseller in Edinburgh, Mr. William Finlay Watson, who died in 1881, by his will bequeathed to the National Gallery of Scotland his collection of paintings, drawings, autographs, manuscripts, missals, written and printed books, literary papers, curiosities, &c. Under the will the sister of the deceased, Miss Helen Aberdeen Watson, was to have the use of the collection during her lifetime, and after her decease, the Trustees of the Gallery were to select from it whatever they thought worthy of a place in the National collection. Miss Watson died a few days ago, and the collection is now at the disposal of the Trustees of the Gallery. The collection contains numerous examples of rare and valuable etchings and engravings, several of which Mr. Ruskin declared to be invaluable. Amongst other works the collection contains Wilkie's original sketch for "The Penny Wedding," two early works of Turner, as also paintings by Holbein, Vandyke, Hogarth, David Roberts, Alexander Naysmith, &c. Several of these works are portraits which will be valuable acquisitions to the Scottish National Portrait Gallery. Amongst them are portraits of Queen Mary, Darnley, Edmund Spenser, Shakespeare, George Buchanan, Charles I., Christopher Columbus, the Admirable Crichton, Henry Mackenzie, Smollett, James Watt, and others. Miss Watson was herself an enthusiastic collector of antique curiosities, her proclivity taking the appropriate lady-like direction of old china and drapery. These she has left to the Scottish Museum of Science and Art. They embrace a dressing gown of Napoleon I., the tea-tray, cup and saucer from which Robert Burns drank tea with "Clarinda," &c.

IN the course of operations upon St. Giles' Cathedral, Edinburgh, consequent upon the formation of the Chambers Memorial Chapel, the workmen came upon the arm bone of the patron saint, St. Giles. This relic, as it appears, originally encased in a valuable casket enriched with jewels. At the Reformation, the Magistrates sold the casket and appropriated the proceeds, but, with characteristic Scottish caution, hid the relic itself in anticipation of the possibility of a future rise in the price of relics, then at a low ebb. If now offered for sale, it may yet realise a considerable sum, which might appropriately be applied to the decoration of the



fabric. It is alleged by some that the Kirk is rapidly tending towards Rome, but the time is hardly ripe for reinstating the relic in its original place, although the effigy of the Saint has been recently installed over the new and richly-decorated west doorway, a cause of much scandal to rigidly orthodox Presbyterians.

ONE of the provisions in the new Allotments Act is that the parish school-room shall be used for meetings in connexion with the allotment of a village. It is obvious that this provision is another instance of the necessity of village halls. The village school is by no means in many instances the best place for public meetings, especially where the best kind of school furniture exists. School furniture must from time to time be improved; the ordinary bench and desk is not always the best form of article. Every meeting means some disarrangement of school furniture. Often also meetings disarrange night classes, &c., which are held in the school-room. The fact is that a village hall should be found in every village of any size; it can always be used as a reading-room, and its very existence would enable many meetings and gatherings to take place which are now impossible.

AN Oxford correspondent writes: "The *Durham County Advertiser* of the 29th, in referring to Mr. Claude de Neuville's drawing of an interesting old building at Oxford, known as St. Giles's Old Parsonage, states that it was 'purchased by the Executors of William of Durham, in 1219.' Dr. James Ingram, in his 'Memorials of Oxford,' informs us that it was originally a hospital, said to have been founded by Ailwin Godose. It is described in the MSS. of University College as a cottage, which led Wood to think that it had been alienated from the use of a hospital as early as 1219, when it was, among other things, purchased as above-mentioned. But we find it denominated 'Le Spital' nearly 200 years afterwards,—namely, in the will of John Cole (Oakley), of Oxford, dated 1390, in which he leaves a small legacy to each poor person then in the hospital."

ANOTHER important competition for a monument to the deceased Emperor William I. has been decided, this time for the Province of Westphalia, the site chosen being on the well-known Wittekinds-mount of the Forta Westphalica (see page 110, *ante*), and again we hear that Herr Bruno Schmitz has gained the first prize. It is certainly remarkable that so young an artist should be successful in all these monument competitions he takes part in, and whatever style they are designed in!

THE old silk-mill at Derby, which fell in a few days ago, was established on an island in the Derwent, by John Lombe, in 1719. When Crotchet's attempts to introduce the art of silk-throwing into this country had failed, Lombe went to Italy, where he is said, at the risk of his life, to have obtained access to some manufactories by bribing the workmen, and to have committed to paper by stealth the results of his observations. However, he takes out a patent, on September 9, 1718, for "three engines," whereof he says:—

"I have at very great expence and hazards found out, discovered, and brought into this kingdom the art of making the three capital engines or sets of working tools called in Italy II inganotors or incuator—fillato, and ilsort, . . . to work their fine raw silk into orgazine [*sic*], which are now used in Bologna, Piedmont, and some other foreign parts."

His specification contains, in Italian, some technical terms, in respect of which he writes, "there are not proper English names for things that have never been known or used here": and water was to supply the power. Lombe leased the island from the Corporation, and there built his mill,—five stories high and 200 yards in length,—which was considered a wonder of the age. He brought over two Italian workmen, one of whom, according to

William Hutton, who was employed in Lombe's mill in 1730, turned traitor, and poisoned his master at the instigation of a woman who had been sent from Italy for that purpose. Lombe died, after a long illness, about seven years after opening the mill, which his relative, Sir Thomas Lombe, carried on. The building has since been used as a steam laundry; but of late years has been in a ruinous state.

THE improvement of that branch of the River Pleisse which passes through Leipsic has been taken in hand, and for this purpose the waters have had to be turned off on a considerable length of the course, so that the rays of the August sun fall on the black mud at the bottom. The work itself (alterations on the embankments, &c.) is being done with all possible speed, and we also note that the upper layer of the filth is gradually being cleared away; but it seems most discreditable that the municipal authorities of the city should sanction the carrying-out of a work, dangerous at any time in a sanitary point of view, in the hottest month of the year. Even if the official representatives are not "in town" at present, and perhaps also not the members of the "upper thousand," the bulk of the inhabitants are in the city; the schools having had their holidays in July; and as the stench in the vicinity of the waterway is excessive, and numerous well-inhabited mansions overlook the course, it is indeed a wonder that disease has not yet broken out. Looking at the death-rate of the town, we find the percentage nearly twice as large as the London one; in fact, statistics show that this Saxon city ranks among the unhealthiest in the civilised world; a fact not to be wondered at, considering the bad drainage and wretched state of sanitary arrangements in general.

LAST year Dr. R. J. Petri undertook a series of experiments at the Charlottenburg Polytechnic, in order to test the efficacy of textile air-filters for excluding micro-organisms. A short account of these experiments was published in the "Proceedings of the Institution of Civil Engineers." A measured volume of air containing germs was passed through a filtering-cloth, and the result was ascertained by cultivation experiments on gelatine. The cloth used was a cotton fabric especially made for the purpose, and contained a web of eighteen to twenty threads, and a warp of nineteen threads to the centimetre. The volume of the air passed through was 161.75 cubic metres per square metre of filtering surface. Dr. Petri found that this cloth failed to keep back the germs, as in one cubic metre of filtered air there were 2,900 bacteria and 13,500 spores of fungi. Some experiments were made with another cloth of closer fabric, and which had been used as an air filter for some time. This gave far better results, although there were 510 germs of bacteria and 320 fungi spores in a cubic metre of air. It was found that a cloth which had been used for seventeen months had retained approximately 6,780,000 bacteria and 8,570,000 fungi spores per square metre of surface. These results were calculated to upset the belief of those who were trusting to the efficacy of air filters of this nature, and in a recent number of the German publication *Zeitschrift für Hygiene* (Vol vii., p. 379), Dr. Karl Möller, who is a member of a firm engaged in the production of air filters, criticises Dr. Petri's experiments, the results of which he considers not to be reliable. There are, he says, two kinds of air filters, "germ-proof" and "dust-proof." The former consists mainly of ten layers of a thick, closely-woven, and very rough material. The layers are arranged in a series of bags or pockets, the surfaces of which are placed at an angle to the direction of the air-current, the angle varying between three and five degrees. This disposition of the cloth, it is claimed, has a very great influence on the efficacy of the filter. In the dust-proof filters only one thickness of cloth is used. Dr. Möller com-

plaints that Dr. Petri did not conduct his experiments under conditions suitable to testing the filter. The latter caused the current of air to pass at right-angles to the surface of the cloth, which, further, was strained by the passage of large volumes of air at an excessive velocity. Moreover, the cloth was not sterilised to begin with. On the whole it would seem that further experiments are required before we can say definitely that a "germ-proof" filter has not been made, although it seems too much to expect that, by any arrangement of layers of cloth, micro-organisms can be altogether arrested. Upon the value of "dust-proof" air filters there is, or rather should be, no need to enlarge; their advantages are plainly manifest and consistently neglected.

ELMSTONE COURT, together with the ancient manor of Elmstone, in the lathe of St. Augustine, Kent, which will be offered for sale shortly, is identical with the Elvetone of the Conqueror's survey, being then held of the Abbot of St. Augustine's, Canterbury, by one Ansfrid. It afterwards passed to the Leyborne family: in 53 Hen. III. Roger de Leyborne renders homage for Eylmerstone to Roger de Cycestre, Abbot of St. Augustine's, before many witnesses. Dugdale says that for failure of an inheritor the manor escheated to the Crown on the death, 41 Edw. III., of Juliana, daughter of Thomas de Leyborne, popularly styled the "Infanta of Kent," by reason of her great possessions. King Richard II. settled it upon the Priory of Chiltern Langley, Hertfordshire, which retained it until the Dissolution. Henry VIII. bestowed it *in capite*, at one-twentieth part of a knight's fee, and then valued at 15*l.* per annum, upon his Attorney-General, Walter Hendley. In Hasted's "Kent" (1790) the court-lodge is described as standing "near the south side of the parish, having round it a moat which is supplied by a spring rising just above it, the water from which runs . . . towards the river" [Stour]. A part of the old manor-house, or court-lodge, is incorporated in the present dwelling.

IN reference to the durability of iron bridges, some interesting tests have been made upon a link taken from the Kieff suspension bridge by order of the Russian Public Works Department, Professor Belebubsky carrying out the operations. This bridge was built over forty years ago by Vignolles, who fortunately made provision for a number of spare links being left. This has enabled the tests in question to be made. These links are 12 in. by 1 in., and 12 ft. long. One of the links was taken out of the bridge, being replaced by one of the spare ones. Four test pieces, 1 in. by 1½ in. by 8 in., were cut in the direction of the length from the used link, and the same from another spare link. One 4-in. specimen was also taken from each of the two links in a transverse direction. The tensile strength of the 8-in. test-piece from the old link was 21.8 tons per square inch, the elastic limit 11.1 tons per square inch, the elongation 14.05 per cent., and the contraction 17.35 per cent. of the area. The corresponding figures for the new link specimen were:—Tensile strength 22.2 tons, elastic limit 11.93 tons, elongation 13.42 per cent., and contraction 18.75 per cent. In the specimens taken across the grain, the tensile strength of the link taken from the bridge was 14.9 tons, elongation 2.1 per cent., and contraction 1.6 per cent. The corresponding figures in the new, or rather unused link, were: Tensile strength, 17.32 tons; elongation, 6.0 per cent.; contraction, 6.8 per cent. The tests are satisfactory, as the variation in the figures given in the tests is not greater than might occur between different samples of wrought iron. The superiority of the unused link shown in the transverse test may appear marked to those who have grown accustomed to the more homogeneous metal of which we now more frequently have records, but those who remember how extremely various were the



results obtained by tests of wrought iron, when made across the direction of rolling, will not place too much importance in these figures. It might have been wished that considerable tests could be made on the material of masonry structures than suspension bridges, but this, of course, is a far more difficult matter. It is also to be hoped that in the fulness of time experiments will be made with steel bridges, especially the high carbon steels now becoming popular, which may prove a very different material for withstanding the effects of vibration to the tougher rolled iron, with its interposed layers of slag.

WE read in an evening contemporary that the Peabody Trustees have arranged with Lady Somers, as ground-lord, and the St. Pancras Vestry, for the erection of a large block of workmen's dwellings upon the site of the Polygon, in that parish. The Polygon stands within Clarendon-square, in Somers-town, a district where, as also in the neighbouring Agar-town, of late years considerable clearance has been made for the extended premises and works of the Midland Railway. Clarendon-square has deteriorated very much since the days when William Godwin occupied a house in the Polygon, after his marriage with Mary Wollstonecraft. The latter died here in 1797, and was buried in the neighbouring burial-ground of (old) St. Pancras.

THE correspondence about "sky-signs" which has been going on in the *Times* for the last few days has more of point and reason than some of the letter-writing about odd-and-ends which is encouraged in the daily papers at this season. The rage for advertising in the present day is constantly leading to new methods of display, and it is in the nature of things that each new system that is adopted should be more obtrusive and more self-asserting than all previous ones, since that is really the main motive for adopting it. In these days nothing is sacred from the enterprising advertiser, and we have no doubt that it is only the risk and cost of the erection that prevents us from seeing Pears' Soap advertised along the top of the range of the Alps, in letters large enough for half Europe to read. The town sky-sign is a much more objectionable because much more prominent form of advertisement than the wall-placard; and the only check to its multiplication *ad infinitum* seems to lie in the fact that too great a number of these signs would be in each other's way and defeat their own object. There is room, however, for quite enough of them to form a most serious disfigurement to a city, as well as a new source of danger in high winds and in fires; and it is therefore satisfactory to observe that the firm whose sign has been most complained of in the correspondence referred to have determined on its removal. Messrs. Hudson do not admit the truth of all that has been said against their sign, but they admit that if everyone else in Ludgate-hill put up the same kind of erection the result would be most objectionable, and they therefore intend to remove theirs and avoid setting a bad example. In adopting this sensible course Messrs. Hudson are probably doing themselves much more benefit than they would have gained from the continuance of the obnoxious sign, and they are perhaps also unintentionally heading a movement against this form of advertisement, for it is not unlikely that others will seek, by the removal of similar signs, to gain the same commendation for public spirit which Messrs. Hudson have justly received.

#### "MASONIC REPRINTS."

THE Lodge Quatuor Coronati, No. 2,076, London, has continued its archaeological labours in the interest of the history of Freemasonry since the review of Vol. I. of the Reprints, which was inserted in the *Builder* for Sept. 28, 1889, p. 218-9. That Vol. I. included the reproduction of the great "Masonic Poem," existing in MS., the date of "about 1390"

being now ascribed to it (first half of fifteenth century formerly). This was accompanied by a very able "Commentary." There are now before me Vols. II. and VII., both bearing the date of 1890.\* The latter may be at once described as containing a lithographed facsimile of the 232 pages of the quarto volume entitled "The New Book of Constitutions of the Antient and Honourable Fraternity of Free and Accepted Masons," by James Anderson, D.D., London, 1738, in the vulgar year of Masonry, 5738. An interesting "Introduction" by Mr. W. J. Hughan gives an account of this compilation, which first appeared in 1723; and writes of it, "But whatever may be its merits or demerits, according as we look at the volume leniently or critically, the fact remains that to it, and to it alone, we are indebted for a history of the Grand Lodge of England, from its inauguration in 1717 to 1723, when the official records begin, and from that period for an able extract of the Proceedings; hence the work has been described as the 'basis of Masonic History,' and 'the Father of English Masonic History.' This volume being now scarce, it has been selected as one of the series of Reprints, and could not have been more faithfully represented.

Volume II. is of a different character. It contains in Part I. a facsimile and transcript of a manuscript in the British Museum, considered to be the second oldest of the Constitutions or Old Charges of Masonry, and from its having been issued in 1861 in a fairly good manner by the late Matthew Cooke, it is styled the "Matthew Cooke Manuscript" to distinguish it from the earlier one (noticed in the *Builder* of 1889 as above) now called the "Regius Manuscript." The date of "not later than the first half of the fifteenth century" has been given to it by Mr. E. A. Bond, of the British Museum, while by others the latter part of fifteenth century. Part II. is a facsimile and transcript of a similar "Constitution" in manuscript in the Lansdowne collection in the Museum, of a date of "circa 1500" or about "1600." Part III. is a facsimile and transcript of another such manuscript in the Harleian collection to which the date of "beginning of seventeenth century" has been assigned by Mr. Bond, while "after 1721" is considered right from its containing certain "New Articles" (which first appeared in print in 1722), but the Harleian MS., 1941, which also has them is ascribed to "cir. 1670."

If of the Regius MS. no history is attached, there is some to this one of Mr. Cooke, for there is little doubt that it was known to Dr. Anderson before 1723; and the "Woodford MS." is an almost verbatim copy of it, made in 1728 by Wm. Reid, Secretary to the Grand Lodge, for Wm. Cowper, "Clerk of the Parliament," who himself had been Grand Secretary. While a transcript is here given in Volume II., there is at the same time a modern reading printed for the benefit of the unlearned in old English. The Secretary of the Quatuor Coronati Lodge, Mr. G. W. Speth, commenting upon this manuscript,—the Cooke MS.—considers that it is probably not more than fifty or sixty years earlier than the time of its author; but I consider that it is evidently the book in use among the Masons of some particular part of the kingdom, when and where our author was associating with them. And further than this, it is the purest, least altered copy of these Constitutions that has at present come down to us, and therefore the most valuable, far exceeding in intrinsic value the metrical version presented to us in the Regius MS. It consists of a commentary preceding a version of the "Old Charges"; the subsequent "Constitutions" make this commentary a part of the book itself. He considers the rhymed version, the Regius MS., is composed from a later original than the prose version or Cooke MS.

The Lansdowne MS. is written on one side only of four sheets of stout paper, measuring about 18½ in. by 13 in.; while the Harleian MS. is of twenty pages, measuring 7½ in. by 5½ in., the writing leaving very small margins. The chief interest attached to this last is that it contains "The New Articles," consisting of clauses determining who may be elected a Free Mason, "the said society, company, and fraternity of Free Masons shalbee regulated and governed by one master and assembly and wardens—at every yearly general assembly; and noe person

shalbee accepted a Free Mason or know the secrets of the said society untill hee hath first taken the oath of secrecy hereafter following."

It will, therefore, be seen that there are in this Volume II. three versions of the "Old Charges," of various dates and of various merits. No one can doubt that each was written for the use of a Lodge of Masons; the "when" is doubtful, and the "where" quite unknown. The earlier MSS. were also, no doubt, used in the operative Lodges at the admission of an apprentice. This Cooke MS. contains the line (621) that Athelstan's son "lerned practyke of that sciens to his speculatyf. For of speculatyf he was a master." If the MS. be of the date given here to it, namely, say about 1430, or even of the end of the fifteenth century, it shows, I consider, a *very early* use of the term, for can the word "speculative" be found used earlier than 1530? The word occurs neither in the Lansdowne nor Harleian reprints; nor in the 1738 reprint of the old Constitutions now presented, nor in any other copy to which I have had access. This line 621 has been often quoted, but perhaps its absence from so many copies may not heretofore have been observed. Have the learned commentators on these manuscripts considered the point, especially in their chronology and classification of them? It is stated that the fac-similes of these two interesting manuscripts are the work of Mr. F. Compton Price, and that they will bear the most rigorous inspection and comparison with the originals. I can honestly add my testimony to the apparent great care bestowed upon them, and the beauty of their execution. WYATT PARFOWITH.

#### THE TRADE UNION CONGRESS.

THE annual Congress of Trade Unions is being held this week at Liverpool, and, according to all accounts, is being much more largely attended than usual.

The opening proceedings took place on Monday, in Hope Hall, when about 450 delegates were present. Mr. J. Swift, of Manchester, took the chair in the first instance, and in his opening remarks referred to the great changes which had been made in the status of trade unions and unionists since the Congress last met in Liverpool (in 1875).

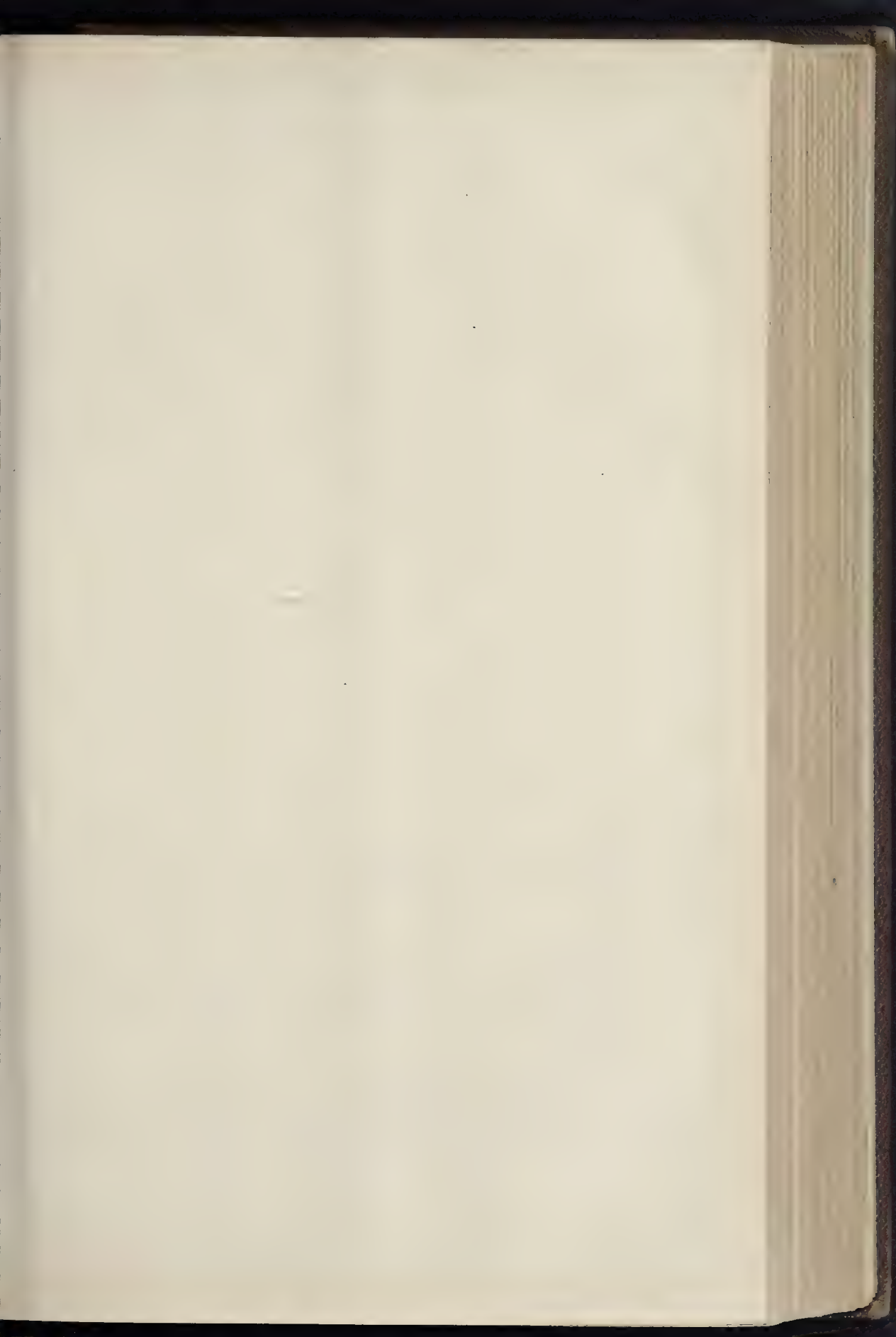
On the motion of Mr. Peters, President of the Liverpool Trades Council, Mr. William Matkin, general secretary of the Carpenters and Joiners' Society, was unanimously elected President of the Congress. Having taken the chair, he called upon Mr. Broadhurst, M.P., to read the Report of the Parliamentary Committee, from which the following passages are extracted:—

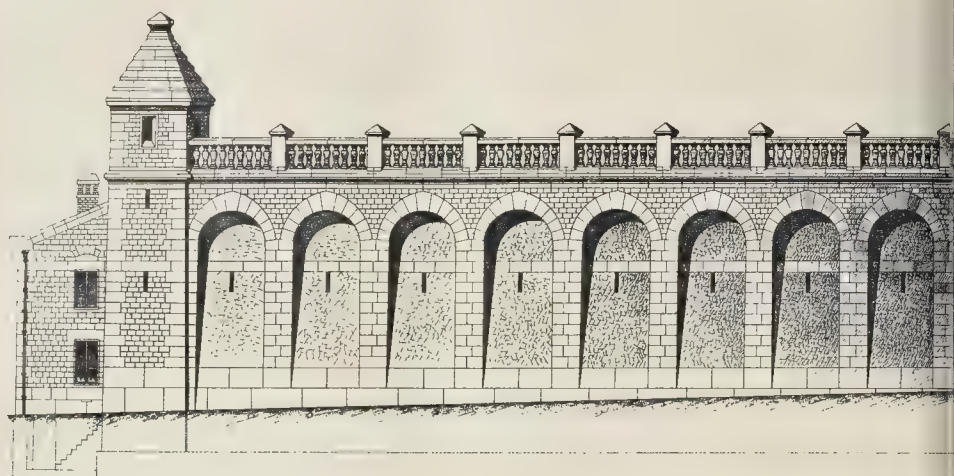
#### Employers' Liability.

"The last Congress was looking forward with considerable anxiety to the action the Government would take with respect to the above question during the session that has just expired. Although the Government promised to deal at an early period with the matter, they did not introduce their Bill until some time after the commencement of the session. Immediately the Bill was made public, your committee held a full meeting, and unanimously instructed the secretary to move that the Bill be read a second time that day six months whenever the second reading stage should be reached. This decision, which was not arrived at until after a long and careful examination of the terms of the measure, was based upon the following objections,—namely, that while the Bill was in many respects an improvement on that of 1888, inasmuch as it abolished a great many complicated parts of what was then known as clause 3, yet it retained the principle of contracting out of the Act, maintained the doctrine of common employment, and limited our existing common law rights; while the clause relating to seamen was declared by the secretary of the Seamen's and Firemen's Union to be useless and inoperative except to about 5 per cent. of the men engaged in the mercantile marine. Taking all these circumstances into consideration, your committee were of opinion that it was better to oppose the progress of the measure, and to await the advent of a new Parliament, when the ballot-box will clear men's minds with regard to our just requirements; and a new Government, of whatever party it might consist, will introduce a broad measure, giving to the working-classes the same law as is at present in force for the benefit of the general public. For more than this we have never asked, and with less we shall never be contented."

\*Quatuor Coronatorum Antiquaria. Masonic Reprints of the Lodge Quatuor Coronati, No. 2,076, London. Edited by G. W. Speth, P.M., Secretary. Volumes II. and VII. Margate: Printed at Kelle's Gazette office. 1890.





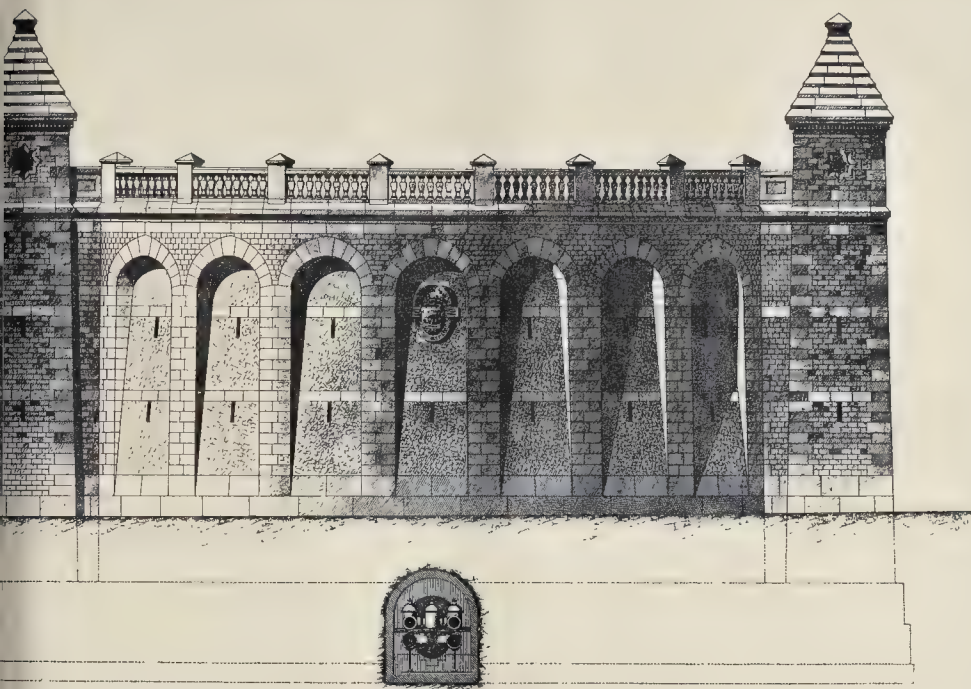


RESERVOIRS DE MONTMARTRE

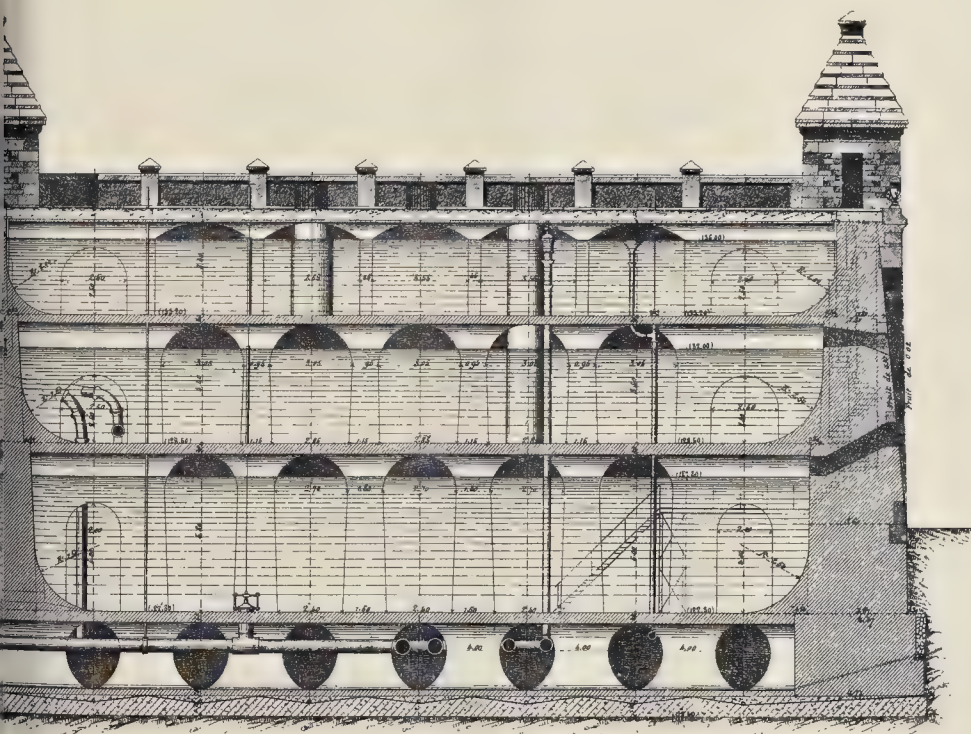


RESERVOIRS DE MONTMARTRE





PRINCIPALE DOMINANT, PARIS.



LONGITUDINALE.

PHOTOGRAPHED BY E. & J. MARTIN, 10, RUE DE LA VILLE, PARIS.





*Factory Act Amendment Bill.*

"Your committee, in conjunction with the committee of the textile factory workers, in the early part of the session, invited a number of members of Parliament connected with the textile and other districts most directly affected by the Bill, to meet them in conference at the Westminster Palace Hotel, London. Some forty members attended the meeting. Sir Henry James presided. Mr. Birtwistle explained the objects of the proposed changes in the law, and at the close of the conference it was resolved:—'That the members of Parliament representing textile and other districts most directly affected by the proposals, should form a committee for the purpose of conferring with the representatives of the employers and employed, and discussing with them the provisions of the draft Bill, with the object of coming to some common understanding.' This committee was appointed, and consisted of nineteen members, with Sir Henry James as chairman, and Mr. R. G. O. Mowbray, Mr. H. Byron Reed, and Mr. George Howell as joint secretaries. During the Parliamentary session several conferences took place between this committee and the employers and operatives' representatives, but up to the present they have not been able to come to an understanding upon all points, as the employers, while agreeing to certain modifications of the present law, which are very desirable and will be of considerable utility, strongly object to some of the main features of the Bill, and we are afraid that no satisfactory agreement can be arrived at with the employers, and that there is no other course left open to us but to introduce the bill drafted on our own lines."

*Engineers' Certificates Bill.*

"After many conferences, and the expenditure of much labour on the part of your chairman, and the representatives of other societies interested in this question, the Bill has been entirely re-drafted. It was again placed in charge of Mr. Fenwick, M.P., who, from causes quite beyond his control, was unable to secure a debate, or make any progress with it during the session."

*The Labour Conference at Berlin.*

"One of the most notable events of the year was the conference that was held at Berlin, at the invitation of the Emperor of Germany, to consider the question of international labour legislation. We are not inclined to attach too much importance to this gathering, but it is undoubtedly a distinctive step forward, and it has enabled European Governments to become acquainted with the comparatively advanced position which labour occupies in this country. As soon as it was definitely announced that the conference would be held, your Secretary had interviews with members of the Government, and suggested that direct representatives of labour should be sent to attend it. He submitted a number of names of competent workmen for this purpose, from which the Government ultimately selected three—Mr. Burnett, Mr. Burt, and Mr. Birtwistle. We believe that some fruitful results of the conference are to be seen in recent legislation in Germany, and in the increased interest displayed by European nations in the labour question and the condition of the workers."

*The Quarries Regulation Bill.*

"The Quarries Regulation Bill was re-introduced by your secretary, but through lack of opportunity, coupled with the determined opposition of the Government, no progress was made with it. We measure it a most desirable one, and served a better fate."

*Picketing.*

"For some time past the Congress and the committee have been repeatedly appealed to with regard to the law on this subject. The law is, however, perfectly clear, and cannot be mistaken in the permission it gives to peaceful picketing. If those engaged in trade disputes necessitating this means of protection could obtain the information which they could easily get before undertaking the work, there is no reason why they might not conduct picketing successfully and without any liability to prosecution. This, indeed, has always been our intention. In a recent case at Bristol, arising out of the bakers' strike, some men were committed for trial, and the Bristol Trades Council, after consultation with us and adopting our advice with regard to the defence of the men, obtained the satisfaction of hearing a judgment given by Mr. Justice Cave, at the Bristol Spring

Assizes, in which he clearly upheld the rights of workmen in this matter. The essential parts of the judgment were reprinted and sent out to the trades in a circular we issued last May."

*General Remarks.*

"The past year has been one of remarkable activity in the labour world. There are many and various reasons for this increased life. In the first place, combination is perfectly free and recognised by law in the Trade Union Acts, and the law of contract, if not perfect, at any rate leaves little to be desired. Increased interest is taken in workmen's movements by the press, and enormous prominence is now given to labour agitation by newspapers which, in the days which have scarcely passed, had nothing but sneers and misrepresentation when they did not utterly ignore the efforts of the workers to better their condition."

The balance-sheet of the Parliamentary Committee showed that the income for the past year amounted to 1,121*l.*, comprised of subscriptions, 795*l.*; sale of Congress reports, 139*l.*; delegates' fees to Congress, 175*l.*; and that, after meeting the various items of expenditure, there was a balance in the treasurer's hands of 371*l.*

The consideration of the report was adjourned until after the delivery of the President's address.

*The Organisation of Labour.*

On Tuesday, Mr. Matkin delivered his Presidential address. In the course of it he is reported by the *Liverpool Post* to have said:—"Those seers of the press who assert that the present labour revival is spasmodic and consequent on good trade have evidently lost sight of certain material facts. There have been periods of commercial activity before, and necessarily with them increased labour organisation. But in no case has there been the slightest approach to the remarkable developments we have so recently witnessed. It is, therefore, necessary to go deeper than to the state of commerce to ascertain the cause. It cannot, of course, be disputed that the Anglo-Saxon is pre-eminently endowed with great organising faculties. Our colonial expansion, our system of government, our successful local representative bodies, our ancient guilds, and our host of voluntary successful enterprises, all bear testimony to this. Trades unionism is, in fact, an offspring of this spirit. It is practically an hereditary quality. Now, what more natural than when the working classes were educated, came into possession of a cheap literature, and had the advantage of a free Press, these organising qualities should be developed, and that trade combinations should spread rapidly? The present labour revival is, in fact, a distinct step in natural progress, and undoubtedly is the forerunner of a national organisation of industry. There is, of course, no *Ultima Thule* with labour; the goal of one generation must be the starting-point of another; and thus, so long as the working classes

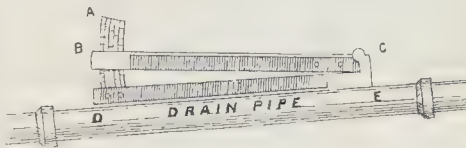
are kept in uncertainty as to their present subsistence and their future security, so long will they avail themselves of every opportunity to strengthen their position, and use the powers of State for the benefit of the labouring multitude. While they may not exactly reverse the rule of the past, wherein the many were sacrificed to the few, they will in future demand that the powers of Government shall be exercised to make the condition of the masses much more endurable than it is at present. Naturally, its first demand in this direction will be for an eight hours Bill. The time has undoubtedly arrived when energetic steps should be taken to secure an eight hours' day; the subject has been vigorously discussed by preceding congresses; the trades sincerely desire it; the Press and the public are aroused to its importance; foreign workmen are determined to secure it, and their various Governments are showing greater readiness to concede it. The bogie of foreign competition will, in fact, shortly be laid to rest. This is not a time to hesitate or halt by the way. The working classes must lead the van; and it is, in fact, to this country that the Continental States look for the initiative in this reform, as was strongly evidenced at the congress recently held at Berlin, under the auspices of the

German Emperor. Although naturally reluctant to discuss a subject upon which there is so keen a division of opinion, I should be false to my duty and to the important results which the people expect from the congress, if I did not pointedly express an opinion upon the eight hours' question. In doing so, may I draw your attention to the significant fact that although a substantial trade revival has existed for nearly two years during which the trade union development has been remarkable, still few general and concerted efforts have been made to establish the eight hours day by means of voluntary efforts. I am not complaining of this; on the contrary, I believe the unions have acted up to the measure of their strength and of their opportunities. If therefore they have, through a variety of causes, been unable to begin the struggle for this inestimable boon, it seems to me that an additional argument has been supplied for legislation. If the eight hours day is not secured when trade is good and when the unions are necessarily at their strongest, it is obviously impossible for them to obtain it when commercial depression sets in and the unemployed clamour at the gates of capital. I have no fear that an eight hours Bill will injure British trade, sap the independence of the workmen, or practically destroy our unions. On the contrary, let me draw your attention to the significant fact that the application of the Factory Acts to the textile trades of this country, and the consequent legal regulation of the hours of labour, has not ruined the cotton trade, and has not to any marked degree played into the hands of the foreigner. Similarly, in the manufacture of machinery, a developing trade demonstrates that the nine hours system has not worked the havoc on our commerce that fearsome prophets foretold. Indeed, many facts justify the conclusion that reduced hours, by developing the physical and mental powers of the individual, really leads to cheaper production."

We will next week briefly record some of the further proceedings of the Congress.

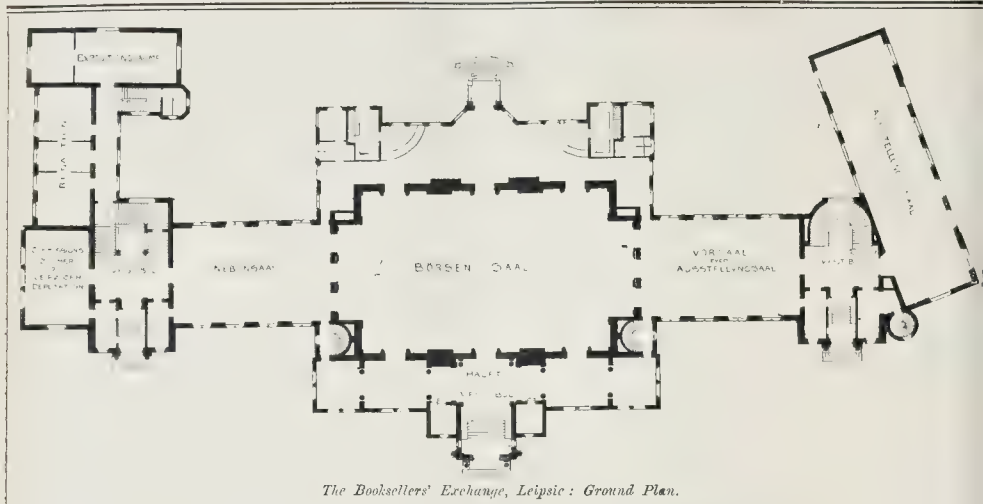
## MOSS FLOWER'S ADJUSTABLE GRADIENT INDICATOR.

This handy instrument, now on view at Stall 34 in the Brighton Health Exhibition, has been devised for laying down gradients and ascertaining the rate of inclination of existing gradients, and will be of great use to architects, surveyors, civil and sanitary engineers, builders, sanitary inspectors, clerks of works, and others. By its use, drains can be accurately laid to any required fall, as will be seen by the accompanying illustration and description of the instrument.



ment:—A is a brass plate accurately graduated to the most useful rates of inclination, including 1 in 6, 1 in 7, 1 in 8, 1 in 9, 1 in 10, 1 in 12, 1 in 15, 1 in 18, 1 in 20, 1 in 24, 1 in 30, 1 in 36, 1 in 42, 1 in 48, 1 in 50, 1 in 54, 1 in 60, 1 in 70, 1 in 80, 1 in 90, 1 in 100, 1 in 150, and 1 in 200. B. C. is the limb carrying the spirit-tube, and works about the pivot at C. Suppose the gradient required for drain is 1 in 30, the limb B. C. is raised to the line marked 1 in 30 on graduated plate A, and is held firmly in this position by a clamping-screw. The level is then ready for use, and the accuracy of the gradient can readily be determined by applying the bed D. E. to the uppermost surface of pipe, or straight-edge, and if the gradient is as required, the bubble will float midway in the spirit-tube contained in the limb B. C. Its adaptability for ascertaining the rates of inclination of existing gradients will afford a ready means of showing at once whether existing drains have a sufficient fall at any particular point, by unearthing the same and applying the bed of the level to the drain-pipe, raising the limb B. C. until the bubble floats midway in the spirit-tube, clamping up, and reading the index.

The instrument is inexpensive and simple in construction, and is made of boxwood, plated



The Booksellers' Exchange, Leipzig: Ground Plan.

with brass. It is only 9 in. in length, the accompanying diagram showing its application not being drawn to scale.

### Illustrations.

#### THE NEW BOOKSELLERS' EXCHANGE, LEIPSIK.

**T**HE new Booksellers' Exchange at Leipzig, which has been designed by and erected under the superintendence of the Berlin architects, Messrs. Kayser & Von Groszheim, shows elevations in a style similar to that used on the German gable houses of the sixteenth and seventeenth century.

The building, which not only contains the Exchange-hall proper, with its vestibule and offices, but also two large halls to be used for special exhibitions, and on the first floor a library and rooms for the collections of the Graphic Museum, is considered to be exceedingly well planned, and has the advantage of being arranged so that it can all be used as an entire whole for festivities or receptions; or it can be used in separate blocks, attainable from without by means of separate entrances, and entirely disconnected from one another.

The material used is brick, the facings being of freestone; the superficial area covered is 2,025 square meters, and the total cost was 700,000 marks. A plan of the building is appended.

#### COURT-HOUSE FOR LOS ANGELES, CALIFORNIA.

THIS building, which has occupied about two years in erection, is now structurally approaching completion.

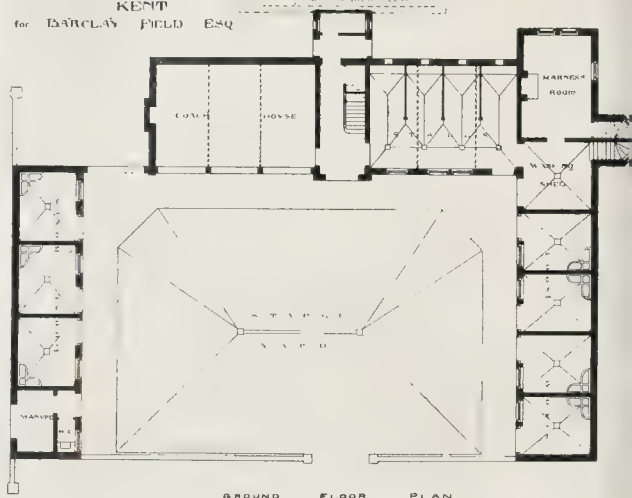
It occupies a commanding site on an elevated plot of land, bounded by Fort, Temple, and Buena-Vista streets on three sides, and by the County Police-station on the fourth.

The building is traversed by a spacious corridor the whole length, on three floors, communicating with principal and two secondary flights of stairs, and giving access to the six court-rooms, judges' chambers, witnesses' rooms, offices for the various civic functionaries, and large apsidal-ended chamber for board of supervisors, together with library, strong-rooms, and well-arranged toilet requisites for each department, janitors and engine-rooms, &c.

The structure is erected upon concrete foundation; the basement is of granite, the upper external walls of red and buff Arizona sandstone, internal walls of brick, and partitions and floors of corridors, court-rooms, &c., of hollow firebrick and concrete, supported on rolled iron joists; the roofs are slated, and have buff terra-cotta ridge cresting and finials, &c., and the tower and turrets are covered with copper.

The heating is by means of hot water circulation; the inlet ventilation is supplied by "Tobin tubes," and for lighting both gas and electric light will be adopted.

#### STABLES AT OTFORD, KENT for BARCLAY FIELD ESQ



GROUND FLOOR PLAN

The tower is utilised for water supply tanks on two stages, and the upper portion has an observation-room, affording a magnificent outlook over the whole city of Los Angeles and a vast extent of surrounding country.

The lower portion of the internal plastered walls will be finished with moulded and panelled dados, the ceilings of court-rooms coved, and moulded, and panelled; the floors of principal rooms, oak and parquetry, and glazed tiles for corridors, &c.

A Hall of Records, designed in unison with the Court-house, is proposed to be erected on a portion of the site, so that the whole business of the city and county can be conducted in close proximity.

The building was won in open competition by Messrs. Curlett, Eisen, & Cuthbertson, architects, of Los Angeles and San Francisco; and is being erected by Mr. O. E. Brady, of San Francisco, at a cost of 750,000 dollars, under the immediate superintendence of Mr. Curlett.

#### STABLES, OTFORD, KENT.

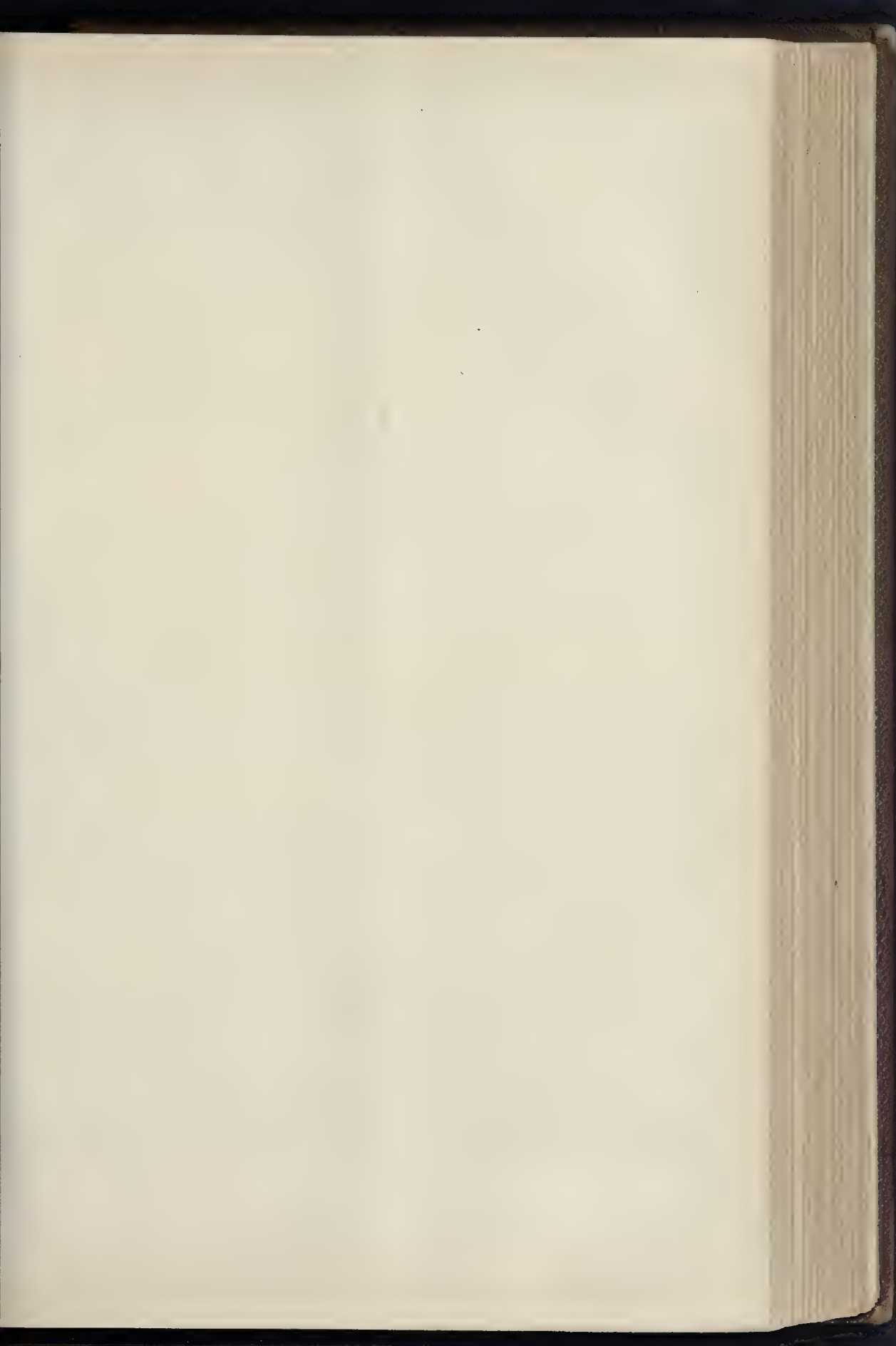
THESE stables were erected at the same time as the house previously illustrated (see *Builder* for October 16, 1886), and at some little distance from it, upon the estate of Mr. Barclay

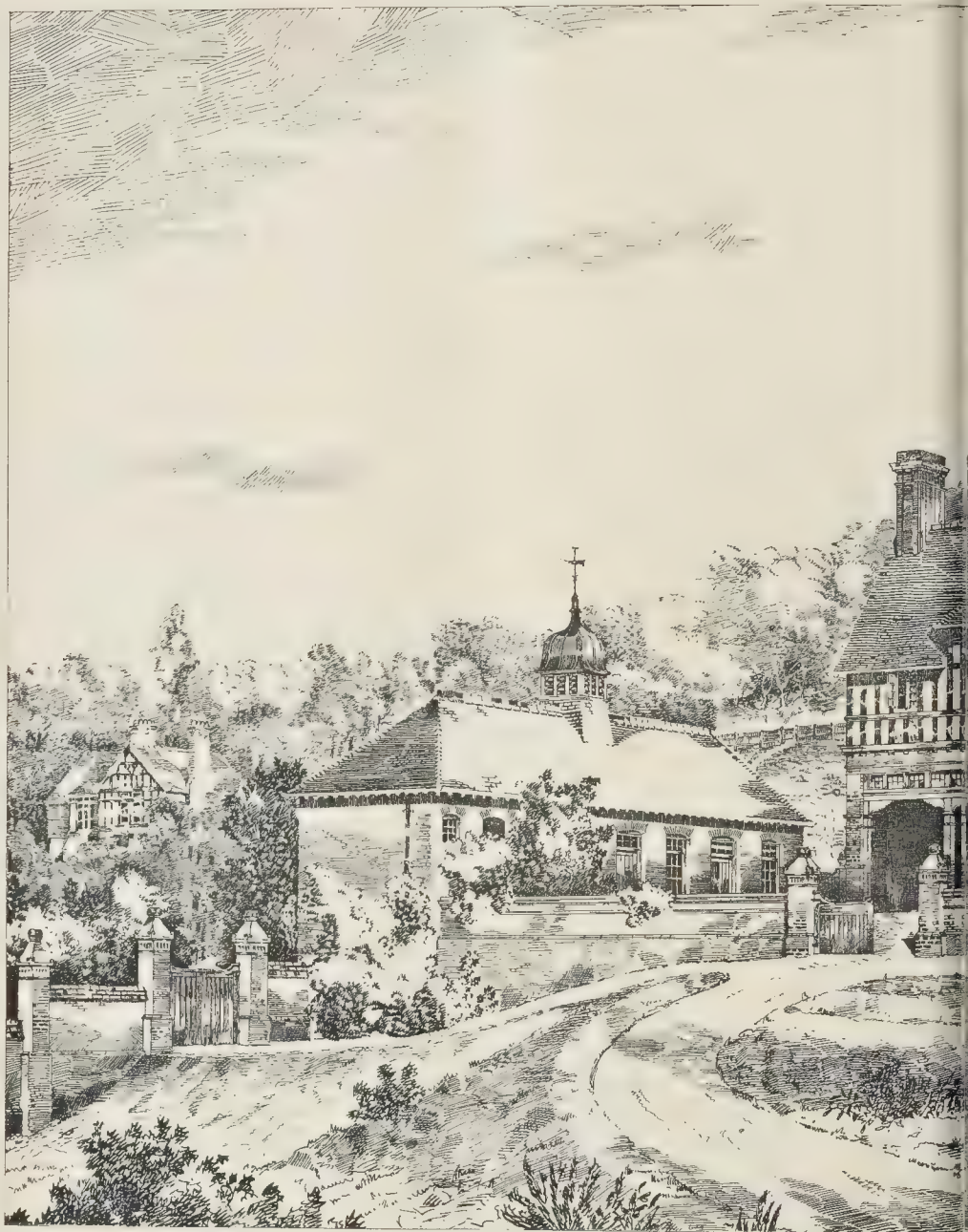
Field, near Sevenoaks. The buildings adjoin the kitchen garden, and are (as well as the engine-house for electric lighting and pumping from well) upon a steep slope, which had to be excavated for the stable-yard and buildings. For these latter the contract was 3,353*l*. The materials are red brick, with half-timber work above, filled in with plastering and finished with tile roofs. The upper story contains coachmen's living rooms, lofts, &c. The perspective view was shown in the Royal Academy exhibition in 1889.

#### THE NEW RESERVOIRS AT MONTMARTRE.

We gave last week illustrations and a description of a number of the picturesque fountains which formed the ancient means of water-supply to Paris. We give this week an illustration of one of the latest and most important additions to the modern system of water-supply to the same city, the section and elevation of the Montmartre reservoirs. This, it must be admitted, is not picturesque, though an effort has been made to give to the exterior a certain imposing and bastion-like character, and the upper surface of the construction has been left







*Royal Academy Exhibition, 1889.*

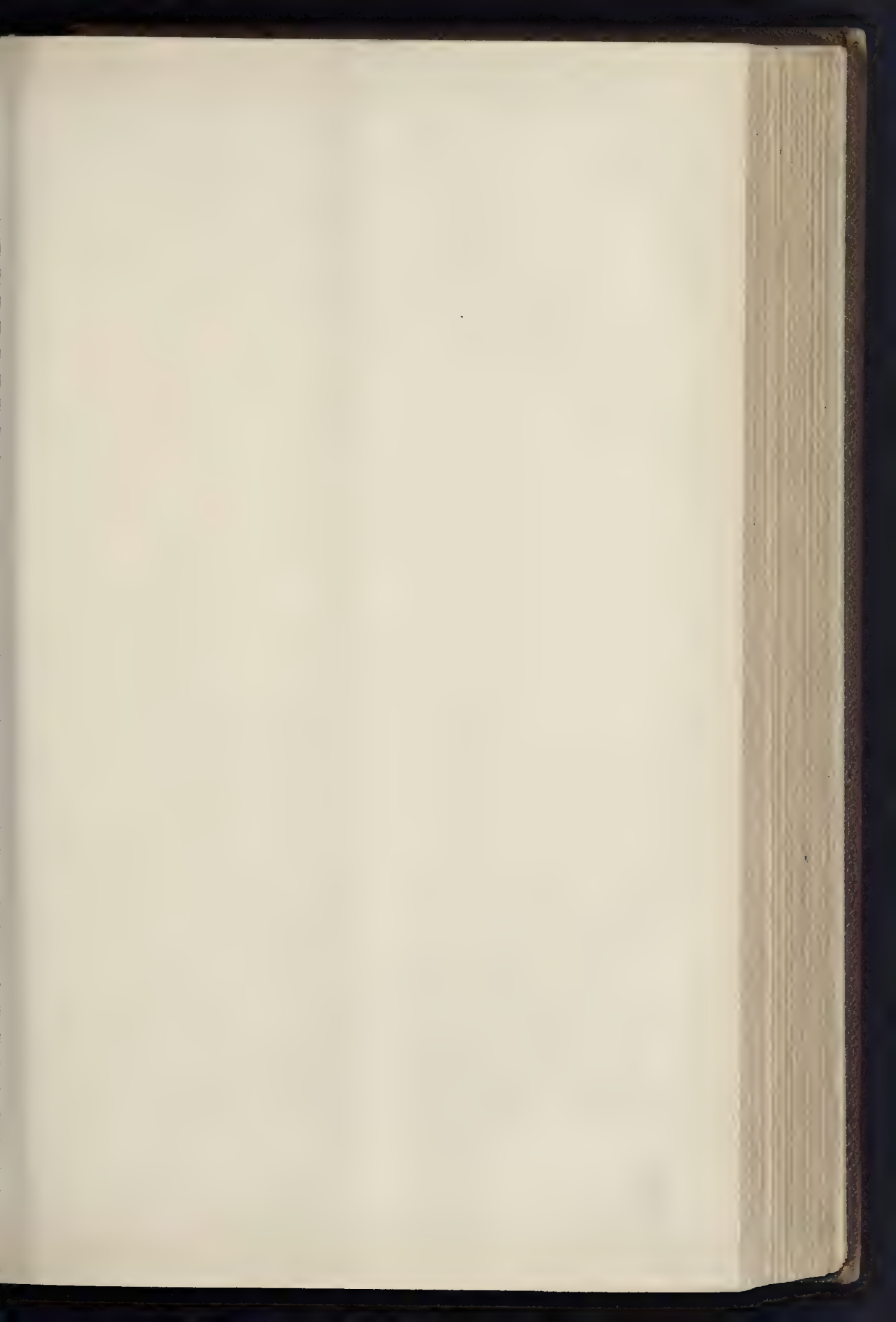
STABLES, OTFORD, KENT.













COURT HOUSE, LOS ANGELES COUNTY, CALIF.





RS. CURLETT, EISEN & CUTHBERTSON, ARCHITECTS.





at as a terrace garden. A model of the whole occupied a conspicuous place in the pavilion of the Paris Municipality in the great Exhibition of last year.

The construction of the reservoirs was entrusted to M. Journet, as engineer, under the direction of M. Bechmann, Chief Engineer of the Sanitary Department. The reservoir is near the church of the Sacré Cœur, and overlooks the whole north quarter of Paris. It is a account of this conspicuous position that some attempt has been made to give the structure a definite architectural character, and with this object the late M. Diet, architect, was commissioned to design the exterior.

The structure is composed of two distinct and separated portions, forming two reservoirs, one a parallelogram in plan, the other with its exterior walls forming segments of a circle: the former, as will be seen from the section, has no stories, the latter three.

The lower stories of each reservoir receive and distribute the water of the river, raised to height of 75 mètres by the engine at the foot of Montmartre hill, and which pumps directly on the pumping station at Bercy, on the banks of the Seine.

The middle story of the larger reservoir and the upper story of the smaller one receive and distribute the water collected from the reservoir of the Dhuis at Ménilmontant. The upper story of the large reservoir is to feed a further reservoir situated in another portion of the high ground of Montmartre.

The reservoir has occupied two years in construction, at a cost of 1,024,000 francs.

# THE SANITARY CONGRESS AT BRIGHTON.

LAST week\* we printed the substance of the address of the President (Sir Thomas Crawford, K.C.B.), and we also gave a description of the Health Exhibition. We now conclude our account of the Congress by giving summaries of and extracts from various papers read thereat.

## Earth versus Water.

Section I., "Sanitary Science and Preventive Medicine," was presided over by Dr. G. V. Moore, F.R.C.P., who took as the subject of his address "The Living Earth." He said he applied the epithet "living" to the dark-coloured inert mould which the countryman sees in the fields and gardens, and which the town dweller finds in the flower-pot which holds his struggling geranium. Having shown that the black vegetable mould which lies upon the surface of the earth, is largely composed of organic matter, and that the micro-organisms of the soil are very active in producing changes in organic matter added to the soil,—changes usually in the direction of oxidation, he proceeded as follows:—

"Supposing comma bacilli to exist in dejecta, that is the best way to stop their multiplication and accidental passage into drinking-water? Clearly to dry them and place them with other saprophytes. If they be buried in the upper layer of vegetable mould, the sun will dry them; or, even if it be raining, the drying filter will stop their passage downwards. The growth of saprophytes will kill them; and the ground be cultivated, the comma bacilli will be destroyed and nitrified, and pass upwards into the crop, and not downwards into the wells. If, on the other hand, the dejecta are mixed with water, and be taken in an impermeable pipe through the living humus of the surface, to the dead mineral subsoil where the sun does not reach to dry them, and where saprophytes to eat them up exist not, the danger of their finding their way through interstices and crevices into drinking-water appears to me to be very great indeed. That is the under strata of the soil are a very inefficient barrier against filth contamination has been demonstrated in all our large towns, and especially in London. In that city the lower rooms of the houses are almost universally below the level of the street, and the house-drains leave the house at the lowest point to reach the sewer at a lower level still. underground drains, however well laid, are sure to leak in time; their contents escape, and water continually escaping at one point is sure to work a channel for itself, and take its natural course to the nearest stream or well. Still more sure to happen if the house-drain leads to a cesspool, a contrivance which necessity

invented as soon as we had water under pressure, and began to use it as our only scavenger. In London, a city renowned for its innumerable wells, we have had to close every one of them, and as the excessive dirtiness of the air makes rain-water not available for domestic purposes, we have become absolutely dependent upon the water companies, and it is only quite recently that the public has become alive to the fact that the causes which poisoned the surface wells, are equally poisoning the Thames and the Lea, and the other sources of London water. No thinking being can feel easy about the London water supply, and it is to be hoped that some day the public mind will be roused to an appreciation of the fact that if we want pure water we must make some serious attempt not to foul our wells and streams. I am convinced that in our sanitary arrangements we have not sufficiently distinguished between the living mould of the surface and the dead earth of the subsoil. The living mould is our only efficient scavenger, which thrives and grows fat upon every kind of organic refuse; our only efficient filter, a filter which swells and offers an impassable barrier to infective particles, a filter which affords a sure protection to our surface wells. When we perforate the living humus with a pipe and take our dirty water to the subsoil, we, as it were, prick a hole in our filter, and every chemist knows what that means." Dr. Moore then went on to argue in favour of the exclusion of excremental matter from the sewers; such matter, he contended, should be buried in the "living earth" every day, and household slops should be applied to the top of a different piece of cultivated ground every day. In conclusion, he said that "a nation that fouls its streams and starves its soil is in danger of poisoning and inanition. A nation which imports a great part of its food and a great part of its manure, and systematically and by Act of Parliament throws all its organic refuse into the sea, is undoubtedly living on its capital. Our capital just now is undoubtedly considerable, but we are in a fair way to run through it; and when we have done so who can forecast the future!"

The conclusions arrived at by Dr. Moore were strongly criticised by Sir Douglas Galton, who contended that water was as great a purifier as earth, and that towns with water-carried sewage had proved to be far more healthy than towns where the pail system was in vogue,—and the pail system was what Dr. Moore's proposals implied.

In the same section, Dr. James Turton, M.R.C.S.E., Chairman of the Sanitary Committee of the Brighton Town Council, read a paper "On some Points in Relation to Septic and Infectious Diseases." In the course of it, he said that last year he was called to attend several members of a household suffering from general malaise, headaches, and occasional vomiting. The house drainage was good, but an unpleasant smell was noticed in the kitchen, and the symptoms attacked only the servants and those members of the family who were in the habit of entering the kitchen. He had the flooring taken up, when several of the joists were found to be rotting in places, and emitting the odour complained of. The putrid wood was removed, and a better provision made for ventilating the space beneath the floor. Since then there had been no illness in the house.

Alderman Joseph Ewart, M.D., F.R.C.P., read a paper on "The Sanitary Advance of Brighton." This paper embraced a review of the (a) site, environs, and climate of Brighton; (b) arterial drainage; (c) house drainage; (d) the electric light in its sanitary and hygienic aspects; (e) reinforcement of the health department; (f) the death-rate; (g) the effectual dealing with unhealthy houses and areas; (h) the more frequent removal of dust, rubbish, and ashes; (i) the construction of a destructor; (j) the provision of one or more abattoirs; (k) the accommodation of dairy cows beyond the boundaries of the borough; (l) further extension of bathing accommodation for males and females in northern part of town; and (m) the construction of a grand swimming-bath, so situated as to meet the convenience of the people of the town generally, in which all the boys and girls of the rising generation should be taught the art of swimming as an integral part of physical training.

Dr. A. T. Schofield, M.D., read a paper on "The Value of Hygienic Knowledge to Women." Professor Corfield gave a lecture on "House Sanitation from the Householder's Point of View."

Dr. Arthur Newsholme, M.D., Medical Officer of Health for Brighton, read a paper on "The Bearing of School Attendance upon the Spread of Infectious Diseases." He advocated (1) the compulsory notification of measles and whooping-cough, as well as of scarlet fever and diphtheria; (2) the complete isolation of infectious cases and the quarantine of children in infected houses; (3) that whooping-cough in a house should be no exception to the rule, but should preclude all children of the same house from attending infant schools; (4) that the Medical Officer of Health should give prompt and direct intimation to the head-teacher, of any case of infectious disease among his scholars, and instruct him as to the duration of the infectious period; (5) that teachers shall be strictly forbidden to send children to inquire the cause of absence of absentees, and that a special officer should be appointed for each school to visit such absentees. Further, he urged the importance of instructing parents and scholars in the laws of health. Much mischief in spreading infection was done in ignorance,—an ignorance which was so crass and pertinacious that it was difficult to realise that the sin was not being committed against light and knowledge. With the adoption of these measures he believed that the necessity for the compulsory closure of schools would be very infrequent.

## A National Health Service.

The Hon. F. A. R. Russell read a paper on "A National Health Service." He said that the objections to the exercise of a strong and uniform State control and supervision did not hold in respect to infectious diseases. Those evils arose from causes which were well known, and could be greatly reduced by the application of certain well-known principles by a central authority, having the advantage of full information concerning the distribution of infectious diseases throughout the country from day to day, and of the services of sanitarians of the highest skill and ability. Most localities did not take such interest in bringing their districts to a high degree of salubrity, and many Medical Officers received so small a salary that their occupation as such was disregarded in comparison with their private practice, which they were still allowed to pursue. In fact, the Sanitary Acts in the rural districts and in very many small towns were a failure, and through this failure the whole nation suffered. A neglected village might be the cause, through milk, water, or ordinary intercourse, of destructive epidemics in neighbouring or even distant towns or counties. Infective diseases ought, like fire, to be under the constant and effective supervision of an authority for the whole area over which the destructive power was likely to spread if unchecked, and that area, in the case of infection, was the whole country. A Ministry of Health might learn from the notification already adopted by over three-fourths of the country, the distribution and progress of various diseases, and its officers might be continuously conducting a campaign against them by the best known means. The conditions which favoured the spread of infection were so well known that there would be little difficulty in arresting an outbreak at its inception. The experience of the Westminster Sanitary Aid Association was that even in the midst of a crowded population, and in the case of so easily caught a disease as scarlet fever, it was possible to confine the fever within very narrow bounds.

The Sanitary Aid Association of Hastings almost put an end to infectious illness in that town, although, of course, many visitors must have resorted thither before being perfectly safe. In fact, few Local Authorities had attained the degree of immunity from zymotic disease which was really possible for the whole nation to reach, if willing to conform to certain rules which were beneficial both to the sick and the healthy. Diseases arising from impure conditions of water, or air, or milk, could be easily reduced in their places of origin, and prevented from spreading by isolation and disinfection. But the amount of knowledge, training, and authority required to deal adequately with them was such that no body other than a Government or National Department could fitly undertake the task. And when these infections were constantly travelling beyond county boundaries, even a County Council could not keep their ramifications within view. The plan recommended by

\* See pp. 103-171, ante.



the Joint Committee on State Medicine, of the British Medical and Social Science Associations, still appeared the best which could be devised. By it there was to be created, instead of the many local authorities now existing, one elected and representative body, clothed with all executive functions, whether municipal or sanitary, within the area of its jurisdiction. The Health Officers of the County Boards were to be men of high scientific attainments and acknowledged ability; paid adequate salaries for superintending the whole or a division of a county; to these were to be added Medical Officers of a district, and all were to form one great Department of the State, under the presidency of a Minister of Health, but all these officers were to be under central control, so far as making up one great body of workers for general State medical purposes. The fact was that infectious disease was not merely local, and could not be dealt with effectually by Local Authorities, because if one was active, another was negligent, and they could not attack the enemy with anything like the force or precision of a trained brigade. There was no escape from the urgent need of State control in respect of epidemic and spreading diseases, for a single neglected district was a danger to the whole nation.

Mr. W. H. Collins, F.R.S., read a paper on "The Alleged Danger to Public Health arising from Effluvia Nuisance from Gasworks." He indicated certain ameliorative processes which have been adopted in some of the largest and best gasworks in this country.

#### Baths for the People.

Professor T. Roger Smith, F.R.I.B.A., presided over Section II, "Engineering and Architecture," and took as the theme of his Presidential address the subject of "Baths." Commencing by describing the Roman thermae, of which he said that Professor Aitchison's lectures at the Royal Academy last year\* had given the most learned and complete account known to him, he went on to speak of "Turkish" baths and vapour baths. Coming to the subject of cheap and popular baths, he said that a very considerable number of establishments, some of them opened as private speculations or by small companies, but for the most part provided under the Public Baths and Washhouses Act, existed. Mr. Rosher stated the number of public baths in England having a swimming-bath as part of their installation at 200, out of which seventy were in the metropolis alone. The avowed aim of many of these was to reach the general mass of the people. In addition to the washhouses, we found in one of these establishments one or more swimming-baths and a series of warm baths. Proceeding to examine the nature of each of these provisions, and premising that those who desired further information as to the Baths and Washhouses Act and its results would find it in a compact and serviceable form in the comprehensive report of Mr. Ernest Turner on the subject, prepared at the time of, and in connexion with, the recent Paris International Exhibition, the Professor said the swimming-bath is necessarily a more or less public institution. It is in its nature large and expensive to establish and maintain, but it is almost unequalled as affording to great numbers a means of healthy, pleasant exercise, and as furnishing an opportunity for the young and others to acquire the valuable art of swimming. No pains should be spared to make it attractive as well as convenient. A swimming-bath of modern construction is a large tank, usually long in proportion to its width, shallow at one end and fairly deep at the other, walled in and roofed over, with a floor all round and numerous dressing-boxes. The interior should be light and airy, the water should be sufficiently warm, perfectly fresh, bright and clean, and the dressing-boxes should secure some degree of privacy. As the swimming-bath, if successful, will be worked pretty hard, it is necessary to have the means of rapidly and thoroughly cleansing every part in use, and of quickly emptying and refilling the bath. Gas should be provided. In some cases provision may be made for employing the bath as a room for public meetings or a gymnasium, or in some such way during the winter time when it is not in request. Let us look into the means of carrying out this programme. The most important part of the whole, the swimming-bath tank, requires to have extreme care bestowed upon its construction, lest it should

leak. Portland cement concrete is so well fitted for constructing the bottom and sides that it is not now likely that, save under exceptional circumstances, any other material will be used; formerly brickwork backed up by clay puddle was the best material available, but there was more chance of leakage, and it is said that defects were not infrequent. The pressure of the water against the bottom and sides is not formidable in amount, but the various weights are quite sufficient to cause a partial failure if the foundation gives way, so every care must be taken to ensure an uniform and solid foundation for the bottom, and similar support for the sides, as the smallest settlement will be followed by a crack, and the crack by a leak. Cement concrete is not itself water-tight, and a lining of almost pure cement is required. The actual face of the tank should be of glazed brick or tiles, though when economy is of importance this may be dispensed with. Bands of dark brick or tile running from end to end of the bath are sometimes introduced into the bottom as a guide to swimmers in swimming races. It is desirable to put in at least the foundations of the external walls before beginning to dig for the bath tank, so that the excavation for the baths, when once made, shall not be again disturbed. If the tank be dug and concreted first, the subsequent disturbance of the earth in digging for the footings of the enclosing walls may be enough to cause a crack. Any outlets and inlets required should be decided, as to both size and position, before beginning; and the valves, sluices, &c., put in as the concreting goes on, so that there may be no excuse for disturbing the work and cutting holes in it. I know of one successful case where the side walls of the tank were first formed in trenches, and then the dumping, or great mass of earth in the middle, was got out, and the bottom put in last of all; but there is some risk of making a bad join, and it is better to excavate the whole before beginning to concrete, and then to do the bottom first, and to bestow especial pains and not to stint material in making the join between bottom and sides. The water at the shallow end should be rather over 3 ft. deep, sloping to about 6 ft. at the deep end, and it is not uncommon to have the deepest point about 10 ft. short of the end, so that persons diving in may plunge into the greatest depth. However this may be, every part of the bath must slope sufficiently to one point, to enable the water to be completely run off from the bottom. For cleansing purposes the corners and the join between the bottom and sides should all be rounded so as to prevent any lodgment for dirt. It is desirable to have along the shallow end a perforated pipe with water laid on, so that when the bath has been emptied the attendant may be able, when necessary, to turn on a shower of water while the tank is being cleaned out. The depth of the water should be legibly painted at the sides in several places. The edge of the paving should be rounded, and between it and the water there should be a space of about 6 in., and here a stout teak rounded handrail, or an iron pipe 2 in. in diameter, should be securely fixed on brackets for bathers to hold. The perforated pipe already alluded to may serve this purpose where it occurs. It is desirable also to fix spittoons at regular distances round the edge of the bath, and there should be a stout step-ladder at each corner. The dimensions of the tank must be settled with regard to the probable number of bathers and the means disposable. Every additional foot adds to the cost of original construction and of maintenance, but adds also to the value of the bath to the bathers. For a public bath, less than 25 ft. width and 60 ft. length of water area is not desirable. The length may, with great advantage, be increased to 70, 80, or 90 ft., then the bath should be 30 ft., or even more wide. At most baths there will be swimming clubs, and these clubs will be sure to be instituted, and these festivals have to be considered. Less than 5 ft. width will not do for a racer, so that not more than five competitors could well race in a 25 ft. wide bath, and four would be more comfortable. It is rather desirable, in the interests of the races, to have the length an even number of feet divisible by ten, then three laps make a similar number of yards, and 60, 70, or 80 yards can be swum readily in a bath 60, 70, or 80 ft. long. The water delivered into the bath, whether pumped up or from the mains of a water company, will be too cold for bathing in most states of the weather; and how to warm it is a most

important point, for it is not only essential to be able to raise the temperature from the point at which it is delivered, which may probably, from 50 deg. to 60 deg., up to say 75 deg., or at least 72 deg. Fahrenheit, but it ought to be uniformly raised through the entire mass of water in the bath. If there are cold zones or hot zones in the water, bathers will not like it, and a bath that is disliked will be of comparatively little use to its owners or the public. In some cases hot water and steam is circulated in pipes within the bath itself, the pipes being, as a rule, fixed in a recess formed in them in the walls of the bath. In others a lock-chamber is formed outside the bath tank, a filled with hot-water pipes or steam pipes, and the water is admitted into this cool and returned to the bath warm. In another arrangement the water is drawn off from the bath, heated in a furnace, and returned warm. Sometimes steam is simply blown into the bath itself, an expeditious but noisy way of raising the temperature. Most of these plans are more or less reliable to heat the water unequally, and more than one of them there is apt to be introduced a pipe, or a jet, or a something which is found to get too hot for bathers to touch without injury. The plan the results of which, as far as my experience extends, are the best, is one differing from all these. It was put up for me at the baths of the Carpenters' Company at Stratford, by Messrs. Fraser, and I can speak strongly of the success of this apparatus as a means of warming the water uniformly and effectually, and helping to keep it fresh. At the deep end of the bath, and near the bottom, an iron pipe is introduced, which is carried (outside the tank) back to the shallow end, and to which the water has free access. The course of this pipe is introduced in an iron chamber, into which a powerful jet of steam under considerable pressure is thrown; it acts upon the contained water on the principle of a Giffard's injector, and hurries it on, so that it is returned into the bath, travelling at some speed, and of course the water that takes its place is drawn out at the same speed. The steam mingling with the water in the chamber raises its temperature, and the result is that a stream of warmed water is always pouring in near one corner of the shallow end of the bath, while an equal quantity of cold is always leaving at the opposite end. The temperature is, by this simple means, gradually and equally raised to what is required, and is easily maintained; and what is satisfactory is, that the warmth is found to be uniform all over the bath, and that as the water is always in gentle motion it keeps remarkably clear. A method resembling that of Messrs. Fraser, but carried further, is that of Mr. C. H. Rosher. He employs either a steam-jet just described, or a pump, to effect circulation of the water in the bath tank during the heating process; but he admits the heated water at the bottom of the tank, distributing it over the floor of the bath by discs or spreaders. It is claimed that this method promotes uniformity of temperature, and rapid heating, and prevents steaming from the surface of the bath and loss of heat. With this system of heating this engineer combines a second improvement, directed to secure economical working of a bath. The heaviest expense in working a swimming-bath is usually the cost of water. It will take about 60,000 gallons of water to fill a bath 25 ft. by 80 ft. This, at 6d. per 1,000 gallons, a usual price, will cost 12 10s.; and should the bath be refilled daily except Sundays, the expense would be 9s. per week for water only, in addition to the cost of fuel used in warming the incoming water. Mr. Rosher proposes to filter and to aerate the water by appropriate machinery placed in a small chamber formed for the purpose, and so to render the same supply fit to last much longer. Filtration will, it is considered, remove the solid impurities, such, for example, as those which the settlement of dust on the surface of the water occasions. Aeration will oxidise, and neutralise some organic impurity. I believe the system has been successful at Woolwich and other places, where it has been tried; and there can be no doubt that a plan which will diminish the amount of water used in a bath without rendering it less pleasant or less healthy, promises to effect a very great great economy in working. Other plans for filtration have, I believe, been brought forward, but this is the most complete that has come under my notice, and the only one which includes a provision for constantly re-charging the water with air. The rest of the swimming-bath may be dismissed.

\* Printed in *extenso* the *Builder* at the time, with illustrations.







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PHOTO. W. & A. G. L. MARY N. LANE. 1890. LONDON. E.

KAYSER AND VON GROSZHEIM, ARCHITECTS.





re briefly. There should be a platform not less than 4 ft., and better, 5 ft. to 6 ft. in clear depth at the sides, and 10 ft. at the ends, and the deep end a stage should be erected for diving. The interior should be bright, but direct sunshine on the bathers is undesirable. A bath is best lighted by a series of ample side and end windows, but generally there is not room for that, and a great skylight has to do duty, which it does very well. There should be ample ventilation, under the control of the attendant, and not of the bathers. Ventilation in a swimming-bath is a little difficult to maintain without discomfort to the bathers, especially when the atmosphere is much colder in the air in the bath. A few steam pipes, or hot-water pipes, to warm the dressing-boxes are of essential service, both in this and to keep the place comfortable in cold weather, though it must not be forgotten that the large masses of tepid water radiates heat into the chamber that contains it. There should be, near the entrance, a small shallow bath supplied with hot and cold water and a tepid spray—often called a soap hole—for bathers who come in from dirty work and wish to wash themselves clean before plunging into the swimming-bath. A small laundry for towels and bathing-dresses should adjoin, and be worked by the same boiler as supplies steam for heating water for the swimming-bath and the warm-baths. It will include some sinks, a boiler, a centrifugal wringer, and a hot-closet; and my experience, as far as it goes, that the hot-closet will be better worked, and more certainly, if it has an independent furnace, and is heated by hot air, than if the heat is obtained from a steam-coil. Professor Huxley then proceeded to describe in detail the arrangements of that part of an establishment which he called the warm-baths for individual bathers. In his concluding remarks he said:—It must be admitted that, while the operation of the Baths and Washhouses Act has brought means of bathing within the reach of large numbers of people, it has not gone far enough. I believe it has been the experience of the managers of many of these establishments, that they are not frequented to such an extent as to make them self-supporting; and it needs no consideration to see that the prices charged, though very moderate even if they reach the minima fixed by the Act, do not place the bath within the reach of every class of working people; while the mere fact that these establishments must be on a considerable scale, and therefore cannot be very close together, removes them from the easy access of some of those who would use them if they could. Can we give the bath water to the doors of the people, as we can give them a cheaper bath than anything accessible at present? In London and other crowded towns and cities, I have no doubt that simple, cheap, and accessible bathing establishments, formed in crowded neighbourhoods, set up as a rule in existing buildings, adapted to the wants and the purse of the poor, would be popular and largely used; and the impression is that they could be made to their expenses, and possibly to yield a profit to those who established them. If so, the better openings for practical benevolence do exist than the multiplication of applications of this sort under prudent and careful attention, and I wish the subject may attract the attention of philanthropists. Alluding to means of cheapening baths, the Professor mentioned the spray-baths provided by Mr. C. C. Donington, near Newport, in Shropshire, where a private bath with clean towel is sold for one penny. He said that a trial of the same is about to be made in London, on the owners' Company's estate at Stratford. He referred to Mr. David Grove's spray-baths to Mr. E. A. Reynolds's spray-baths as being of very great service in meeting a public want for cheap baths. Mr. Alderman Hallett read a paper on "The Corporation Waterworks," which were subsequently discussed by the members of the Congress. Mr. R. E. Middleton also read a useful paper on "Waterworks Regulations" with regard to bearing on sanitation. He quoted the regulations of the Liverpool Corporation Waterworks in *extenso* as being, perhaps, as complete as any others. He pointed out that as most desirable, in the interests of the user as well as of the water companies, only reliable plumbers should be employed, referring to the regulations of the Manchester

Corporation Waterworks, he said that No. 15 of those regulations, by which urinals were allowed to be flushed direct from the service pipe if a self-closing tap were used, did not appear to be judicious.

#### Improvements at Brighton.

Mr. F. J. C. May, Borough Engineer and Surveyor of Brighton, read a paper on "Brighton as a Health Resort." In it he gave a short review of the many important works executed from the year 1858 to 1890, mainly from the plans and under the superintendence of Mr. Philip C. Lockwood, M.Inst.C.E., the late Borough Engineer. Referring to the question of baths, Mr. May said that the Corporation had decided to try the experiment of a system of cottage baths dotted about in the poorest and more densely-populated districts; this will have the effect of avoiding long walks to a central large bathing establishment. It will, indeed, be taking the baths to the people, and it is hoped will be a popular movement. The first institution of this kind is being constructed at the present time at Brunswick-place, North. Here a large house has been hired by the Corporation for a term of years, and is being fitted up with eight baths, four for men and four for women, supplied with both hot and cold water. The establishment will be under the care of a man and his wife, who will reside on the premises. From the interest already taken in the progress of the operations by the class of persons for whose use it is intended, there is every reason to believe the experiment will prove a success. In his concluding remarks, Mr. May said "Having given a brief description of the work already done, it will not be out of place, nor betray any official secrets, if I state that it is not the intention of the Corporation to remain satisfied with what has already been done; but, on the contrary, that there is a strong determination to progress in every direction, and to keep pace with the march of science in the interests of the public health. A public abattoir; a refuse destructor; a grand extension of the sea defences eastwards in the parish of Rottingdean, with suitable drives and promenades; a scheme for the better utilisation of the Tenantry Downs; a yacht station opposite Kemp Town; various street improvements to relieve the congestion of some of the more crowded thoroughfares; and a new Town Hall, are matters which are already engaging the attention of the Corporation."

Mr. W. H. Collins, F.C.S., read a paper on "The Necessity for Improvements in the Sanitary Arrangements of Dairy Farms, and for their more careful Inspection by Sanitary Authorities." He fully proved his case.

Mr. C. Hooper read a paper on "Industrial Dwellings."

Mr. John Hanson read a paper on "The Use of Black Ash Waste in the Treatment of Sewage and Foul Water."

#### The London Sewage Question.

Mr. Richard F. Grantham, M.Inst.C.E., read a paper on "The Disposal of the Sewage of London on the Maplin Sands." The paper dealt with the proposal for reclaiming a large portion of the Maplin Sands, and for distributing the sewage of London over the reclaiming surface. Reference was first made to the conclusions of the Royal Commissioners on Metropolitan Sewage Discharge, viz., that some process should be used to separate the solid from the liquid portions of the sewage, and that the solid matter deposited as sludge should be applied to the raising of low-lying lands, or be burnt, or be dug into land, or be carried away to sea. The effluent should then either be distributed on land by means of intermittent filtration, or discharged lower down the river Thames at Hole Haven. The steps taken by the London County Council towards the fulfilment of these recommendations were described, and the utility of the steps as a permanent measure, in the opinion of several eminent authorities, was pointed out. Other methods of disposal were also referred to. The difficulties in the way of irrigation and filtration on land were alluded to, and a list of towns was given to show the maximum quantity of sewage applied per acre per twenty-four hours on their respective sewage-farms, from which a deduction was drawn that not less than 10,000 acres would be required for the proper disposal of the sewage of London. It might well be doubted whether so large an area could be properly devoted to such a purpose near the present sewage outfalls, and the cost of obtaining and laying out the

land would be very great, especially as a new line of railway had recently been made through that part of Essex, near the Northern Outfall. It was feared that, assuming that the chemicals now used did not sufficiently clarify the sewage, the discharge at Hole Haven would cause as great a nuisance to the river there as it has higher up. It was, therefore, proposed by the author to conduct the sewage away to the Maplin Sands as more advantageous than the alternative of utilising it on Canvey Island, in being further removed from any seaside resort, in being larger, and in course of time making an addition to the agricultural area of the country instead of absorbing any part of it. The general outline of the scheme and the dimensions of the culvert were then described, and the quantities of earthwork and concrete required are stated. The surplus excavation from the culvert would be utilised in forming the embankments of the area of the lands proposed to be reclaimed, which was estimated at 10,000 acres. In order to show the capacity of that area—the surface of which was sand—for absorbing and filtering large quantities of sewage, reference was made to the Craigentiny Meadows at Edinburgh, and other places, and taking for examples the volumes of sewage applied at those places, and the results of experiments made to ascertain the degree of purification at certain rates of filtration, it was proposed to lay out the area when reclaimed partly for filtration and partly for irrigation, dividing it into plots by arterial drains to carry off the effluent, so that the whole volume might be disposed of and ultimately discharged into the Swin Channel without endangering the oyster fisheries, and without risk of nuisance to Southend and other places. The cost of the scheme was estimated at 4,500,000*l.*, exclusive of the cost of land.

#### The Iron Process for Disinfecting Sewage.

Major C. R. Conder read a paper on "The Iron Process as applied to the Disinfection of Sewage in Barracks and Dwelling-houses." This process was invented by the late Mr. F. R. Conder, M.Inst.C.E., and was described as a self-regulating chemical process for application to closed drains on various scales. The proportional dosing of the sewage with iron in solution was thus rendered practical at small cost. The result was the disorganisation of the sewage into inorganic elements, producing a silt easily dried, and a pure effluent within requirements of Rivers Pollution Committee. The offensive odours were destroyed and the bacterial germs killed, as shown by Government analysis. Its house application was by an instrument called the "Ferrometer," intended for about ten people, and requiring to be filled and cleared once a month. This had been applied at Windsor Castle, Buckingham Palace, at various houses of the Marquess of Bute, and by the Duke of Wellington, Lord Salisbury, Lord Lorne, and in some 300 cases in country houses to the satisfaction of those who had adopted it. In its *drain application*, at present the process was only working in England on a small scale. It was adopted at Chichester barracks by the War Office, in 1886, and paid for under agreement that it should first be reported satisfactory by the Commanding Engineer. The number of persons provided for was about 1,000. The process was further adopted by the Admiralty at Eastney Barracks, Portsmouth, in 1889, and after six months trial had been reported successful, and negotiations commenced for applying it for 2,000 persons. The Admiralty analyst reported the destruction of bacterial germs in the treated samples. On the property of the Duke of Northumberland at Alnwick, it had been applied to the Castle and to 1,500 persons in the property, and reported by the clerk of the works to be the best process with which he was acquainted. At Grange-over-Sands, in Lancashire, it was applied in 1889 to 300 persons, and the results found satisfactory. The Inspector of the Local Government Board having given a favourable report, the Local Board of Health was empowered to raise money for the development of the drainage system; and that having been carried out, the process was now being applied to the new drains, and had been reported successful. In these cases the form of instrument consisted of tanks and cones placed in pits by the drains, but the principle was the same as that of the household instrument. Further applications on a larger scale were now commencing at Halifax, in Yorkshire, and at Toronto and other places in Canada. The ad-



vantages claimed for the process were—(1) That it can be applied immediately without alteration of existing drains; (2) that it destroys the sewer gases from the point of application, and not merely at the outfall; (3) that the effluent may be discharged direct into any stream without injury to the water; (4) that the expense is very small, and the application simple to maintain; (5) that the silt is inoffensive, and has been shown to make a good manure. The success of the method depended on the proper apportionment and correct position of the apparatus, and on the saving of labour due to the automatic action which secures a constant application. The difficulty hitherto found in dealing with a bulky and offensive sludge was thus overcome.

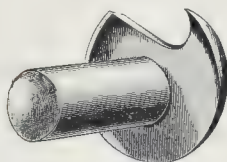
Among the papers read in Section III., "Chemistry, Meteorology, and Geology," were the following:—"On the Climate of Brighton," by Mr. F. E. Sawyer; "On Lead-poisoning from Soft-Water Supplies," by Mr. Percy Frankland, F.C.S.; "On a Case of Well-pollution undetected by Chemical Analyses," by Mr. A. W. Sealiff, D.P.H.; and on "The ill-effects of Floods on Health," by Dr. A. Haviland.

The last day of the Congress was mainly devoted to excursions and visits to various works and places of interest in the locality of Brighton, and in the evening the Congress was brought to a close by Dr. Richardson's "lecture to the working classes," which was very poorly attended. It dealt with the question of hours of labour, the lecturer going very far in favour of the adoption of the eight-hour limit, and hazarding strong doubts whether "Bank Holidays" as at present observed do not do more harm than good to people.

#### DISC CUTTING-TOOLS.

THE new Martignoni tool—the sole right of manufacture of which has been acquired by the Machinery and Hardware Company, Limited, of London—is deserving of attention. Its object is to replace the present straight cutter on the lathe by a disc-shaped cutter of slightly spiral form, with a tooth formed in its periphery like a single tooth of a circular saw. This tooth, which is ground out of the disc and sharpened by an emery wheel on its inner side, forms the cutter. The disc itself is held in position on the lathe or other machine-tool by a strong spindle set at a right angle to the plane of the disc. This spindle is inserted in a cylindrical tube, the two halves of which, being clamped together by a set screw, hold it perfectly secure. The loosening of this circular grip enables the tooth of the disc to be brought up to any desired position on the bar, rod, or metal to be turned or planed, the action of the ordinary tool-carrier of the lathe, when the disc is fixed, bringing it up to cutting distance for a thin or thick cut as desired.

What is claimed for the new tool is—that it is easier to take out for grinding or exchange; that there is no loss of time in fettling and no constant loss of material by short ends; and thirdly, that a higher speed and a deeper cut than usual can be obtained, as well as cleaner than is possible with an ordinary cutting-tool. We concur in the former statement; and in the second to the extent that fettling is dispensed with, the disc being homogeneous in its metallic state and the tooth being able to be sharpened up to the smallest residue of metal capable of supporting the tooth against its work. The tooth might still even be ground out of the residual disc of smaller diameter, so that the final loss of metal might be very small indeed. The wood-cut shows the disc tool with its one



cutting-tooth, and the spindle by which it is held in position. The new tools can be further made of other patterns than simple turning tools. There are already tools made for screw-cutting and spiral or ring groove cutting. The screw-cutting by one of these special disc tools is a very pretty operation, the holder being so made that any desired angle for the cutting-tool can be obtained. In this way it is prac-

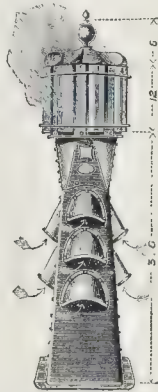
ticable to make a clean thread of a screw by one cut—the work thus will be done in shorter time than at present, and the running into the material avoided.

For boring purposes the disc-tool is held in the holder by a conical-ended spindle, the holder being formed of a long square bar bored through horizontally, with a recessed taper surface, in which the spindle of the disc fits.

There appears also to be less vibration in the new tool than in the old, and this consideration is one of much value.

#### FRYER'S REVOLVING COWL.

FRYER'S patent revolving chimney-cowl and ventilator, of which we give a small illustration herewith, appears to possess some advantages worth notice. It has a square base, gradually tapering off towards the head, and thus forms practically a continuation of the chimney-stack. The inlets, which are "bonnetted"



over, are so arranged on the four sides of the base that the outer current is drawn upward. The cowl is claimed to be noiseless in work, and free from friction, the bearings moving in oil, and the cowl revolving with the slightest current of the air. The cowl has an entirely open head, which allows the smoke to escape freely. There is a hinged flap on the top of the head, allowing easy access to the bearings. The cowl is made of galvanised iron, all parts being rivetted. The manufacturers are Messrs. J. D. & W. Fryer, of Brecon.

#### Books.

*Engineering Estimates, Costs, and Accounts: A Guide to Commercial Engineering.* By A. GENERAL MANAGER. London: Crosby Lockwood & Son.

THIS is an excellent and very useful book, covering subject-matter in constant requisition in every factory and workshop. The preparation of estimates is one of the most important, as well as one of the most difficult and varied, of the duties to be performed in an engineering establishment. At the same time, it is one with which the young engineer gets least acquaintance. The matter of estimates is more one of commercial accounts and personal judgment than of actual engineering. Thus, whilst the articulated pupil is familiarized with mechanical details, it is rarely that any useful amount of commercial knowledge is imparted. In this way, the road to managerial and other responsible salaried positions is in a large measure closed to the engineer. In the early formation of businesses, the want of experience in this direction is embarrassing. The primary object of the book before us is to remedy this defect, and to aid those who have a healthy ambition to rise in their profession to salaried positions. The principles and conditions which control the preparation of estimates are set forth with great perspicuity, and are fully illustrated by a number of tangible examples. Not only is it primarily necessary that the capital invested in an industry should earn its legitimate profits by selling the productions for larger sums than the gross cost of

manufacturing them and delivering them to the buyers, but it is also most important that the effects of competition should be well considered in framing those tenders which are sent out with a view to securing business. In this view the present book is invaluable, not only to the young engineer but also to the estimate department of every works; we may add, too, of considerable service to the principals themselves by the display of varying practices which is given, and the breadth and soundness of their views set forth. Not only are there details for large establishments, but there are equally valuable details for small works where the technical and commercial duties are performed by the same person. In the preparation of estimates, materials and workmanship are the two main bases of the calculations. The kinds and qualities as applicable to various classes of work, and to particular portions thereof, are admirably dealt with in an extensive series of actual examples, thus furnishing to the inexperienced thoroughly firm foundations for his labours, and reminding the experienced of the chief points in many subjects of consideration. The taking out of quantities is a fundamental process in estimating; and very practical examples are given. Very pertinent remarks, too, are appended on the differences and allowances between unfinished and finished work. The experiences of one place and of one period have to be carefully checked; the conditions of workmanship being also modified by the introduction of new tools and appliances. Patented inventions also tend to disrupt old arrangements.

The matter of patterns again is one of much moment, and the suggestions, therefore, as to how patterns in stock may be altered are very valuable.

The most perfect way of estimating is to set forth all the items, adding to the total of probable cost a proportion of the working expenses of the establishment, including management. In this way the gross cost to the manufacturer is ascertained, and the principal adds thereto the profit he thinks he can get from his customer. The other and more general method to reduce the materials and workmanship to standard rates. This mode gives at once a selling price to the buyer, but furnishes no indication of the exact cost to the maker.

The labour rates and duties are well put forward, alike for ordinary and for out-of-the-work. Jobbing orders are lucidly dealt with, and the grounds for higher remuneration in such cases well reasoned out. In steam engine, boilers, heating apparatus, and various other matters, the information and illustrations are equally practical. The author's labours conclude with an essay on manufacturing book-keeping.

The book contains 250 pages, and is a matter of a couple of days' close reading. No one, however, can appreciate it properly without actual perusal; and it probable that even the most experienced will be benefited by so doing.

*The Uses of Plants.* By G. S. BOULGER, F.L.S., F.G.S. (Roper & Drowley, 1889).

THE object of this volume is best explained by the sub-title, "A Manual of Economic Botany," as it is devoted to an account of the vegetable substances employed as food, medicines, and in the arts, and especially to the additions to the list which have been made during the past fifty years. It is intended as a popular manual, but the subject it deals with is so extensive that the book is necessarily far more than a classified catalogue of the materials employed, the names of the plants from which they are derived, and the countries from which they are imported. The excellent synopses and general indices, occupying thirty out of the 224 pages, make it a useful book of reference, and the numerous references in foot-notes to other works enable the student to go to the original sources of information made use of by the author. There are no illustrations, which is a great defect in a book of this kind, where the physical characters of vegetable products were described in terse and technical language.

The difficulty of classifying objects derived from so many different sources and employed for so many different purposes is very great, and Professor Boulger has thought it better to arrange them according to their uses, except the cases of medicines, which are arranged botanically. Thus he divides woods into those required for making walking sticks, for ornamental work and furniture,



or works of construction. It would appear that a substitute for box-wood for the engraver is a great desideratum at present, and that of the twenty kinds of wood which have been put forward our common lawthorn is the best,—a fact which, we believe, is little known in our country districts. It is distressing to our patriotic feelings to read that such common kinds of timber as oak, beech, birch, and ash are largely imported from the Continent and America, while there is so much of it in this country which cannot find a profitable market. The difficulty lies, no doubt, with our expensive inland carriage, and as the railways are not likely to afford much assistance in this respect, it is to a revival of our long-neglected land navigation we must look for help for our pressed forest industries. Dr. Shiloh, of the forestry department of Cooper's Hill College, recently stated that we spent twenty millions annually on the importation of timber, and with proper cultivation of a fourth part of it waste lands this deficiency in our supply could be met.

The section on paper materials is among the most interesting in the book, and we learn from it that not only are numerous new fibrous plants available, but that some of our soft, white woods are being used for paper-making. The one has not yet arrived, we fear, when rags can be dispensed with, and the insanitary results associated with their importation got rid of. On the other hand, while wood is being made into paper, waste paper is being used as substitute for wood, and is being converted to coach panels and tram wheels, and even to "black patent leather." With the development of this industry we may hope for the disappearance of the disfigurement of our streets and parks by waste scraps of paper. We find no account of the source and botanical character of peat-moss, now so largely imported from abroad and employed as bedding for horses and cattle, nor of the much-increased growth and use of the tomato as an article of popular consumption. The statistics of imports are somewhat antiquated, the most recent having reference to the year 1886; but keep pace with our ever-widening commerce and the development of new industries would require an annual revision and issue of the work.

**Handbook of Athletic Sports.** Edited by ERNEST BELL, M.A. Volume I.: Cricket; Lawn-Tennis; Tennis; Rackets; Fives; Golf; Hockey. Volume II.: Rowing and Sculling; Sailing; Swimming. London: George Bell & Sons. 1890.

THE first volume of this series affords a curious enough anything but a unique example of the capability of many writers on games to put themselves in the position of those who have no acquaintance with the game supposed to be described, and to give a clear and logical description of it. According to the editor's preface, the object of this series is "to give in a concise form, by writers whose eminence in their respective branches enables them to speak with authority, a clear description of each game, with practical instructions and hints, such as will be helpful to the beginner and the more advanced player." If that is the object, the book does not answer to it, in regard to all events the two most important and popular games described. No one who was ignorant of cricket and lawn-tennis could gain a clear idea on this book of how the two games are played, or of their general principle. The authorised rules are given, but rules do not explain a game. In the Hon. E. Lytton's satire on cricket there are many remarks and hints, written out in a very desultory and haphazard manner, which are useful and suggestive to young players who have learned the game; but there is no clear general statement of the principle and details of the game, or of the ends to be kept in view in bowling, batting, and fielding; there are diagrams of the different placing of the field for fast and slow bowling, but no explanation of the reasons for them; there is a long dissertation on bowling "lobs," but the reader is not told at a "lob" is. If it were our business to write about games, we would undertake to write, within the compass of one column of this journal, a description of the game of cricket in which the uninformed reader would gain a clearer idea of it than he will be able to extract from Mr. Lytton's ninety-two rambling pages.

It is not much better with lawn-tennis. The

rules are appended, but there is no logical and concise description of the principle and method of the game, which is what a reader ignorant of it naturally looks for. There is a chapter on "the volley," but he is not told what a "volley" is; and so on.

The section on the older game of tennis proper, by Mr. Julian Marshall, is much better done, and here the author gives a complete description of the progress and method of the game. Golf is also intelligibly described. But cricket and lawn-tennis, the most popular and widely played of the games included, are not; and the sections concerning them ought to be re-written, if the book is to fulfil the object professed in the preface.

Vol. II., which treats of rowing, sailing and swimming (which, by the way, are not "sports," but arts) is much more satisfactory, and indeed within the space allotted could hardly be better done. "Rowing" is done by Mr. Woodgate, "Sailing" by Mr. E. F. Knight, and "Swimming" by Messrs. M. and J. R. Cobbett. All three writers (for we may consider the two swimming writers as practically one) are careful to remind the reader that mere book knowledge cannot do more than put a man in the right way of learning what can only be really acquired by actual practice; but at the same time the instructions are so practical and so clearly worded that any tyro who had studied them would enter a boat or enter the water with a distinct idea as to what he had to aim at and what to look out for. The sailing section is especially well done, and contains a good deal of information which is permanently useful for reference; and if this short treatise were studied by those who ambitiously put themselves into sailing-boats at watering-places, without in any sense "knowing the ropes," they would know a little better what to do in an emergency than they sometimes do, and would be aware of some dangers into which people run, and sacrifice their lives, through pure ignorance that there is any danger. The section on swimming has also the merit of being remarkably clear in its description of the methods of swimming, so that a beginner can really learn from it what he ought to try for, at all events. This second volume of the series can be cordially recommended as a very useful one.

"The Great Tower for London" (compiled and edited by F. C. Lynde, A.-M. Inst. C.E., and printed and published for The Tower Company, Ltd., at the office of *Industries*, 358, Strand) is a sixteenpenny pamphlet containing illustrations and descriptions (the latter being, however, very incomplete) of the sixty-eight competitive designs for the tall tower which Sir Edward Watkin and his friends propose to build at Wembley Park, or somewhere in that vicinity. We sincerely trust that the tower will never be built; but whether it be built or not, the present pamphlet will remain a curious and interesting record of the competition. But it is to be regretted that the compiler's work has been so hastily and meagrely performed. The details given are not always accurate, and we are informed that the cost of one design (No. 19, by Mr. J. W. Couchman) is over-stated to the extent of more than 800,000*l.* As all the illustrations are engraved to the uniform scale of 300 ft. to an inch, their comparative height and bulk can easily be seen. Some of the designs, as we pointed out at the time of their exhibition, are fearfully and wonderfully conceived, and many of the designers (or is it the compiler?) are judiciously reticent in their descriptive notes.—"The Gas Consumer's Diary," with full directions for reading the index of a gas-meter correctly, and for checking gas accounts (London: The Blackfriars Printers, Ltd., 8, Salisbury-court, Fleet-street) will be found very useful, and well worth the twopenny for which it is to be had.—The Report of the North-Eastern Sanitary Inspection Association for the year 1889-90 (Newcastle: Standard Chambers, Neville-street) shows a marked advance on the reports of previous years. It records much useful work done, and we are glad to see that it is directing attention to the question of school ventilation, in which there is much room for improvement in many districts.

**FOUNTAINS AT GLASGOW.**—At the same time that the Doulton fountain was presented to the City of Glasgow, as mentioned in our last, Messrs. McDowall, Steven, & Co. presented their fine iron fountain which was exhibited in the Glasgow Exhibition, and which has now been erected in Cathedral-square.

## Correspondence.

To the Editor of THE BUILDER.

### HOT-WATER SUPPLY.

SIR,—Lately I have put into my house a range which was much recommended to me, but which has a very small boiler, without a manhole, and so placed as to be inaccessible without opening brick-work. When, on my return home, the arrangements were explained to me, I wrote to the maker, and am by him assured that the circulation is so rapid as to prevent incrustation, however hard the water be. I admit that the circulation is rapid, but should certainly not have ordered the range had I understood the form and position of the boiler. The article in your number of July 12 induces me to ask you if there is any hope that the rapid circulation will prevent incrustation; for myself I fear that, though it might serve for the soft waters of northern counties, the very hard waters of the colliery will soon choke the whole boiler.

**ENQUIRER.** The rapidity of circulation is governed by the heating power of the boiler, i.e., a powerful heating boiler is not successful in creating a rapid circulation. Now, an efficient, or powerful boiler is a desirable thing in every sense, except its liability to become incrustated more quickly than one of average power, supposing it has regular use. With "very" hard water, the boiler under ordinary circumstances cannot last more than two years, unless provision is made for, and attention is given to, its regular cleaning. Rapidity of circulation can only be due to rapidity of heating; a rapid heating boiler is one that "furs" most (under the circumstances named), but the rapid movement tends to carry the precipitated matter into the flow-pipe also more than it would do otherwise.

### "A SANITARY NOTE FROM GREENOCK."

SIR,—Under the above heading, on page 130, *ante*, there is a long article in which, *inter alia*, the system of trapping and ventilating the house-drains at Glasgow is attacked, and facts are set forth with the Greenock officials for recommending drainage to be done in Greenock on the Glasgow plan. Now, "X. Y.," on pages 130 and 131, does not really find any fault with the Glasgow system of trapping the drains, but with the system in which he says the drains are ventilated. He condemns the practice of putting the ventilating fresh-air inlet gratings directly over the traps, because, as he says, when a water-closet, e.g., is let off, bad air may flow up through this grating. To prevent this "X. Y." advises that "all air openings to or from traps and drains should be carried up as high as the main roof." Now, I do not consider this to be at all necessary in general practice. I have not done it for inlets even of manholes where the expense would have been no obstacle had the plan been worth the candle. I have no objections to siding with "X. Y." in a general condemnation of the inlet ventilating gratings being put in directly over the traps, and especially when those traps are on the pavement and close to building, or the entrance to it. Independent of risk of smells coming up, the traps are often choked at tenement houses, when the gratings are right over the traps, by children putting down umbrella wires, and sticks, &c., through the gratings. Now, in practice, I find that the clogging of the traps and complaints of bad smells from the grating can be easily cured without going to the expense, &c., of carrying up ventilating-pipes to the roof,—viz., by putting a strong iron plate, 8 in. or 10 in. square, over the trap, for examination and cleansing, and then having the fresh air inlet grating a couple of yards, or less or more, according to circumstances, to one side. This has been a common practice in Glasgow for years back, and if Greenock follows suit, the grounds for the objections made by "X. Y." vanish, especially if the work is properly done.—I am, &c., W. P. BUCHAN.

Glasgow, August 30, 1890.

**DEPLETION OF WATER-SUPPLY BY MANURE.**—In the current volume of the Proceedings of the Institution of Civil Engineers some particulars are given of some investigations made by MM. Thonot and Brouardel to ascertain the course of an epidemic of typhus fever at Havre. The conclusion they came to was that the outbreak was due to pollution of a spring at Cotillon from whence water-supply is derived. It appears that towards the end of the years 1889 and 1887 the cultivated plateau of Gainsville, which covers the water-yielding layers of Cotillon, had been manured for the first time with the contents of the refuse tubs of Havre. The formation is chalk, under which is a layer of clay, and upon the outcrop of the latter the water appears as a spring. The investigations undertaken show that a chalk spring under these conditions may be polluted at its source. Even a thickness of 22 to 27 yards of chalk does not offer sufficient security against pollution, because contaminating substances may pass through the fissures of the chalk.



## The Student's Column.

### HOT-WATER SUPPLY FOR BATHS, LAVATORIES, &c.—X.

TANKS, CYLINDERS, &c.: *continued.*

**I**N regard to the pressure of water from pipes into closed vessels, it should be remembered that the same strain is exerted upon the internal surface of the cylinder or tank with whatever sized supply pipe may be used, whether it be  $\frac{1}{2}$  in. or  $1\frac{1}{2}$  in. or larger. The result may be stated as follows. If the water within a pipe having an internal area of one square inch exerts a pressure of 1 lb. for every 2 ft. 4 in. of its vertical height on every square inch within the cylinder, a pipe having an internal area of half this size will only exert half the pressure, *i.e.*, half a lb., or a pipe having an internal area of two square inches will cause a pressure of 2 lbs., but with the  $\frac{1}{2}$ -in. pipe the pressure of half a lb. will be felt on every half square inch in the cylinder, and with the 2-in. pipe the 2 lb. will be exerted on every two square inches, so that the total result is precisely the same.

In purchasing tanks or cylinders it is very desirable to get them from makers who have a reputation for good quality work. No doubt there are small firms who supply excellent goods, but to purchase tanks or cylinders at a low price will almost certainly be found to be false economy, and nothing is more annoying than to find, when charging a new apparatus to test it, that the tank or cylinder leaks at the joints or rivet holes. It is also undesirable to use these reservoirs of too light a quality, *i.e.*, those tested to a less pressure than they will have to bear. This is very often done with impunity, as, of course, the makers' tested pressure does not indicate the bursting point, and where the pressure is only a pound or two over the maker's test marks no harm will ensue, but it is far better to have the reservoir a trifle too strong, as we have not only to think what it has to withstand now, but also that it will be expected to do the same work several years to come, when it is beginning to suffer from wear and tear.

If a tank is of a large size, or unusual shape, it should have "stays" (rods extending from side to side) within it, as immediately pressure is exerted the sides are pushed out, and it has a tendency to become as round in shape as it can get.

The following are sizes of tanks and cylinders customarily chosen as being suited for ordinary domestic purposes where no special requirements exist. With the smallest form of apparatus having two taps (scullery and bath), 25 gallons; this size, however, will be found insufficient if the demand is more than moderate, by reason of a large family occupying the house, and 30 or 35 gallons would be found more suitable; but regard must be had to the capabilities of the range-boiler; there are exceedingly few 3 ft. ranges that have boilers capable of working satisfactorily with a larger reservoir than 25 gallons.

In a little larger house, say nine or ten rooms, 40 or 45 gallons will be found a convenient size, the kitchen range being 4 ft. (or 3 ft. 6 in. with a fair-sized fire boiler); in larger property the size must be judged according to the number forming the household, and even the number is no sure index, as baths are indulged in much more by some people than others, and the style of living regulates the quantity of hot water required in the scullery, and it is the bath and scullery taps that make the greatest inroad upon the store of hot water. Sixty gallons is a full size for a residence of some pretensions, and it is unusual to exceed this size in private residences, except in mansions of the largest class, and with a large staff of servants (in which case an independent boiler would probably be required). Too large a reservoir is very objectionable, as it renders the work of the boiler almost futile; it is not so much a great store of hot water that is required as a moderate amount that can be renewed quickly.

### PIPES, TAPS, AND OTHER FITTINGS AND APPLIANCES.

The kinds of pipe commonly used in this work are wrought-iron steam tube, galvanised ditto, wrought-iron gas-tube, and lead pipe. There are other kinds less commonly used, such as copper tube, &c.

The tube which has preference in the south of England, and which can safely be recommended before any other, is that first mentioned on the above list. This pipe is in general appearance much like gas-tubing, except that its substance is much greater, and in quality of metal it excels the latter; it can always be distinguished by its being coloured a dull red (except when it is galvanised), whereas gas-tube is always a natural black. Everyone having a reputation to uphold uses the steam-tube; and, although a great deal of gas-pipe is to be found, it will generally be discovered in speculative work of a poor class. The difference in cost between steam and gas tube is about 30 per cent.

There is very little galvanised tube used or needed in hard-water districts, as the only object of the galvanising process is to render the tube fairly rust-proof, and so prevent discolouration of the water and weakening of the pipe itself by oxidation. Now the lime which, as already explained, is the cause of the hardness of water, is one of the best of rust-preventives, and it fulfils its usefulness in this direction by coating the internal surface of the pipe with a thin film of carbonate in a very few days, and the rust difficulty is then quite obviated. In soft-water districts, however, some non-rusting tube has of necessity to be used, as water without lime in it always seems to act so vigorously on rusting iron, and the plain steam tube in these districts causes a good deal of trouble by its being eaten away rapidly and discolouring the water to a greater or less extent. Galvanised tube, if well galvanised, overcomes the difficulty almost perfectly, but care has to be used in fitting it up, as it will not do to forge this pipe in any way (that is, beat it for bending or setting purposes), as the galvanised surface will be injured and rusting ensue, and wherever a pipe is cut and screwed, also, the interior of the socket-joints are all places where rusting cannot be helped.

Pipes are sold which are galvanised on the outer surface only, but it is almost unnecessary to point out that this must be avoided, as no benefit is obtained by the extra outlay. Caution is also necessary to see that when galvanised steam-tube is ordered, the steam quality and strength is obtained as this material is not kept in stock by everyone, but galvanised gas-tube is.

When galvanised tube has, of necessity, to be used, it is, of course, somewhat necessary to have the boiler galvanised also (or of copper) as the rusting takes place in these almost as badly as in the pipes; but both galvanised pipes and boilers should only be used when circumstances make it requisite, as the acid bath and subsequent galvanising process are considered to be rather detrimental to the iron.

Lead pipes and copper boilers and reservoirs are most commonly used in the North of England, particularly in the Manchester and Liverpool districts, where the soft water requires every consideration. Lead pipes certainly do not rust, but there are other disadvantages connected with this material; for instance, it has been forcibly brought to people's attention that soft water has as vigorous an action on lead (the lead of commerce) as it has upon iron, and the lead which is separated or taken into solution by the water has brought about many serious epidemics of lead poisoning, or plumbism, in various districts, and this lead to the introduction of tinned lead pipe, that is, lead pipe having its interior surface of metallic tin, which is not acted upon by soft water in the way described.

Lead pipe has another drawback, and that is its softness, which permits of its being easily stretched or bulged and weakened by every strain that it is subjected to; on this account it is almost impossible to use the system of shutting plug cocks with lead piping, as the jar or concussion that is occasioned every time a tap is shut soon does serious injury, weakening the pipe and necessitating repairs. This is most noticeable with the taps at the bottom of the house, where a considerable pressure of water may exist, and in these situations the slow-closing screw-down taps should always be used with lead pipes.

**SALE OF RAY LODGE ESTATE, MAIDENHEAD.**—This property, belonging to the Misses Lassell, was sold at auction last week for 20,000*l.* The sale was keenly contested, and it is understood that, whilst the house and grounds will be left intact, the remainder of the land will be devoted to building purposes.

## GENERAL BUILDING NEWS.

**THE NEW SCIENCE AND ART MUSEUM, DUBLIN.**—On the 29th ult., the new Science and Art Museum and National Library at Dublin was opened by the Lord Lieutenant. The new buildings are situated at right angles to Leinster House, the premises of the Royal Dublin Society, and form the town residence of the Duke of Leinster, on the Kildare-street or western side, in the space where the horse show used formerly to be held. The architects are Messrs. Deane & Son, of Dublin. The occasion of the last visit of the Prince and Princess of Wales to Ireland was chosen for the laying of the foundations, and the ceremony was performed by His Royal Highness the Prince of Wales on April 10, 1885. The buildings are Messrs. Beckett Brothers, of Dublin. The Museum building was in November last handed over to the Science and Art Department. In June of the present year the sister building for the reception of the National Library of Ireland was completed. The style of architecture is Italian of the sixteenth century. The cost of the buildings approximately is set down at 120,000*l.* The façades of both buildings, which face each other, are over 200 ft. long. They consist of two rotundas, with colonnades and a large portico in the centre of the Museum building is a large court, 125 ft. by 75, and opening from it are twenty-four galleries of rooms for the exhibition of objects of interest. On the occasion of the opening ceremony, Mr. Thomas N. Deane, the architect, was knighted, an honour which, the Lord Lieutenant said, was "a fitting recognition of the services rendered by Mr. Deane, who had won in his honourable profession and of the excellence of his latest work."

**BATHS, STAFFORD.**—At a meeting of the Stafford Town Council on the 2nd inst., the Public Baths Committee presented plans for baths, the erection of which they recommended at an estimated cost of 6,500*l.* The scheme included a Turkish bath, a large swimming-bath for gentlemen, gentlemen's private baths, six ladies' baths, dressing-rooms, &c. The buildings will be three stories high, will be situated on the Green Bridge, with a frontage to the River Sow. Underneath the premises there will be a boat-house. One of the large baths will hold 50,000 gallons of water, and a smaller one 16,000 gallons. Considerable discussion took place concerning the committee's proposals, but ultimately the minutes were adopted.

**CHURCH FOR SEAMEN AT CARDIFF.**—A meeting of the building committee for the new Church and Institute for Seamen at Cardiff was held last week on board H.M.S. *Thetis*. Tenders were opened, and that of Mr. James Allen, amounting to 4,410*l.*, and the lowest, was, after full discussion, accepted, Mr. E. M. Corbett is the architect.

**THE FOUR OAKS RACE-COURSE, SUTTON COLDFIELD.** It has been decided within the last few days to offer, in building lots, the well-known Four Oaks Race-course, Sutton Coldfield, near Birmingham. There are understood to be mortgages on the property to the extent of some 30,000*l.*, and the mortgagees have consequently stopped the operations of the Four Oaks Race Company, and have just put the property up for auction. 35,500*l.* was reached, but the reserve price of 40,000*l.* was not reached, and the estate was withdrawn, and the auctioneer announced that it would be put up into building plots. The estate is 245 acres in extent, and it was formerly used as the seat of the late Sir John Hartopp, who resided at Four Oaks Hall, which still stands in the centre of the race course. Another house known as the Dover House stands on the outskirts of the enclosed race-course area, which is 193 acres in extent. Part of the ground is covered by a coppice known as the Lad Wood, and a belt of timber also runs round the greater part of the boundary.

**NEW HOSPITAL, BIRMINGHAM.**—On the 26th ult. the Marquis of Hertford laid the foundation-stone of a new hospital to be built in Edmund-street, Birmingham, for diseases of the ear and throat. The building is to be in the Queen Anne style of architecture, and will be built of red brick with terra cotta dressings, and roofed with red tiles. It will consist of five stories. The ground floor is to be used by the out-patients to the number of 200. The second floor will contain three wards, a dispensary, the dispenser, and the secretary. There will also be a strong-room, and a mortuary, the latter approached from the outside. The first floor will contain two day rooms, two men's rooms, operating room, ward, matron's apartments, baths, with all modern sanitary appliances. The second floor will contain three wards, a house surgeon's apartments, nurses' rooms, linen room and baths, and all the necessary sanitary arrangements. The third floor will contain kitchen, scullery, and four bed-rooms. There will be accommodation for twenty in-patients. The building will embody the best modern improvements and requisites necessary for a new special hospital. The architect is Mr. J. A. Cossins.

**NEW FREE CHURCH FOR INVERNESS.**—The Inverness Dean of Guild Court have granted the necessary warrant for the erection of a new church for the Free North congregation in Bank street, Inverness. The new building, which is to be erected from designs by Messrs. Ross & Macbeth, will cost about 8,000*l.*



**MODEL LODGING-HOUSES, NEWPORT.**—Some model lodging-houses, situate at the corner of Dock-street and Corn-street, and erected of plain stone-work, with fire-brick dressings for the windows, have just been completed at Newport. Mr. John Linton is the contractor and Mr. E. A. Lansdowne the architect. The total cost of the premises has been about 3,000*l.* for the shell and 750*l.* for fittings and finishing.

**REBUILDING MERCAT CROSS.**—At a recent special meeting of the Stirling Town Council, intimation was made that a gentleman, who did not wish his name to be made public, had kindly offered to bear the whole cost of restoring the ancient mercat cross of Stirling, which it is proposed to re-erect on its old site in Broad-street. The offer was accepted, and the thanks of the Council awarded the unknown donor. —*Scotsman.*

**NEW SCHOOLS, MILES PLATTING, LANCASHIRE.**—The foundation-stone of new Roman Catholic schools, to be erected in Varley-street, Miles Platting, was laid on the 30th ult. The buildings are intended to provide for the accommodation of 550 children, and will cost 2,448*l.* The building is to be a model school, and will be used as a school of design. It is being built by Mr. M. Geo. of Oldham-road, on the designs of Mr. Leonard Stokes, F.R.I.B.A., London.

#### ANTHARY AND ENGINEERING NEWS.

**CLOSMEL WATERWORKS AND SEWERAGE.**—The new Council of Clonmel, in Ireland, lately advertised two separate open competitions for the best schemes for the waterworks and sewerage of the town. A London engineer was engaged as assessor, and, acting on his advice, we understand that the committee have unanimously adopted the schemes submitted by Mr. W. H. Radford, of Nottingham. The Town Council have then decided to carry out the waterworks at once under Mr. Radford's superintendence. In the waterworks scheme Mr. Radford proposes to bring the water by gravitation on a mountain stream at Glenmorgan, having a watershed of 1,700 acres, the intake being situate about three miles from the town. Filter-beds, and a great service reservoir, to hold two days supply, will be situate on a hill near the town, the pressure being sufficient to command the roof of the highest building in the town when the consumption is at a maximum. The gravitation main will deliver 8,640 gallons a day at the service reservoir. Water mains, with the usual fittings, will be laid in every street. The population to be supplied is 12,000, and the estimated cost of the engineering works is 8,000*l.* In the sewerage scheme Mr. Radford proposes to lay new pipe-sewers in every street, the sewage being brought down to the outfall works by gravitation. The present sewers are proposed to be used to convey the street surface water into the river. Joint outfall works the sewage will be treated by duplicate gas-engines and centrifugal pumps and treated in tanks by chemical precipitation, followed by filtration in filter-beds, the effluent being conveyed to the river Suir. There is a tank der the engine-house for storing the night sewage. There will be arrangements for flushing, inspection, and a station overflow. The estimated cost of the engineering works is 8,000*l.*

**WATER SUPPLY OF DUNDEE.**—Recently a committee of the Dundee Water Commissioners had a meeting with Lord Airle, at Cortachy Castle, with the object of having the 8,000,000 gallons of consumption water from Lintrathen reduced to 6,000,000 gallons daily, but no arrangement was arrived at.

#### STAINED GLASS AND DECORATION.

**WINDOW, EMMANUEL CHURCH, WESTON-SUPER-MARE.**—Another of the windows on the south side of this church has been filled in with stained-glass. The general design harmonises with that of the adjacent window. The subject is "Christ walking the Sea, and Peter essaying to go to Him." The window is the design and work of Messrs. Joseph H. & Son, College-green, Bristol.

**ALLOWAY CHURCH, Ayr.**—A baptismal font has been erected in Alloway Church in memory of late Mr. James MacNaughton, of Smithfield, Ayr. It is made of Caen stone, according to the design of Mr. J. Mavric Anderson, London. The font, which is octagonal, is supported by eight columns, and on each side an appropriate symbol is carved.

**THE CHAMBERLAND - PASTEUR FILTER.**—Dr. Berthel, of Berlin, has been making some experiments with the Chamberland-Pasteur filter, a pressure filter, with porcelain cylinders, which, it is claimed, would give water free from bacteria. The water used was that of the Berlin Waterworks, which became infested with bacteria when allowed to stand for a time. The results arrived at were that the filter in question would only give water free from germs for a period of four days at the most. At first the water obtained would be sterile, but after three days or so the filtrate was found to contain an active and prolific water bacillus, which followed shortly after by bacteria. The latter was described as appearing to grow through the pores of the filter.

#### FOREIGN AND COLONIAL.

**FRANCE.**—The towns of Roubaix and Turcoing, which in their progressive extension have for some time been approaching each other, will soon be definitely united by a wide straight road to be driven from the centre of the one town to that of the other. —The National Museums Committee has decided to send to Marseilles the bust of the celebrated caricaturist Daumier, who was a native of the town. The bust is the work of M. A. Lenoir.

—At the town of Saintes, in the Lower Charente, a commemorative tablet has been placed on the house in which the late Jules Castagnary was born, who died in 1888 when occupying the position of Directeur des Beaux Arts. —A permanent exhibition of the works of living artists born or resident in the department of the Lower Seine is to be shortly opened at Rouen, in one of the galleries of the museum. —There has been discovered at Marlotte, a small place frequented by Parisian landscape-painters, a regular factory, as it may be called, for the manufacture of pictures with the signature of Courbet, which have been extensively sold in Belgium and Switzerland. —M. Dubois Pillet, one of the founders of the annual exhibition of "Artists Independents," died recently at Puy, at the age of 44. He was a devoted disciple of "Impressionism." —A National School of Industrial Art is to be founded at Roubaix in October.

—At Perigueux the "restoration" of the celebrated Byzantine tower of the Cathedral of Saint Front has just been completed. The cupola and the forty-two shafts round the base of the tower have been repaired, entirely rebuilt.

—In the competition for a new church at Aix-les-Bains, the design of M. Arthur Bertin of Chambéry has been selected for execution. The second premium has been awarded to M. Joseph Alix of Lyons. —A competition has just been opened for the construction, in the grounds of the asylum of Valenciennes, of an isolated pavilion for paying patients. —In the diocese of Nancy a large church is in course of construction, for which about 200,000 francs of subscriptions are already collected.

—At Lyons the statue of Henri IV., which decorated the façade of the Hôtel de Ville, has been seriously injured from the effects of one of the violent storms, which various places in France have lately been visited. We regret to hear that M. John Lewis Brown, the well-known Parisian artist, is dangerously ill.

**AUSTRIA.**—The new great Natural History Museum in Vienna is now fully finished, both as regards exterior and interior. We have already given a description of the building.

**CREVELL.**—A serious accident happened here on the 10th ult. During a thunderstorm, accompanied by heavy rain, the front wall of a three-story building (erected some thirty years ago) gave way and fell inwards, causing the whole building to collapse. Of the forty-eight people in the building at the time of the accident, the official report states that twenty-six were killed.

**WÜRZBURG.**—The municipal authorities have been busy with a scheme for a new bridge over the river Main, to be erected at the south end of the city; and it has now been decided to open a competition for a suitable design for this piece of work, 550,000 marks will be voted for the erection of the new bridge and 150,000 marks extra for the necessary alterations of the embankments pertaining to the work. No difficulty will be experienced with the foundations, the bed of the river showing a durable limestone formation.

**REGENSBURG.**—On the 25th of last month a statue of the deceased King Ludwig I. was unveiled here with all due ceremony, the likeness of the monarch having been placed in the famous "Walhall" of the town. The monument is worthy of note for the quality of the material used, the stone of the statue (a block some 9 ft. high, weighing 400 cwt.) having been brought from the quarries of Tacus Bianca, and showing a very fine grain and colour.

#### MISCELLANEOUS.

**THE ENGLISH IRON TRADE.**—The English iron market is somewhat quieter, and its tone is not quite so strong as it was a week ago. There has, however, been no essential weakening of prices. The only giving way has been in pig-iron. The Glasgow warrant market has been easier, and, owing to this, consumers of Scotch makers' iron have been buying less freely, without, however, bringing down makers in their quotations. Midland iron has been more sensitive, and No. 3 foundry has dropped 1*s.* 3*d.* a ton, to 46*s.* Hematites, on the other hand, have resisted the reaction, and are quoted by makers 6*d.* a ton higher. In Lancashire, Staffordshire, Derbyshire, and Lincolnshire, no reduction has been made. Manufacturers iron keeps firm, and some makers even ask more money than last week. Black sheets have been advanced 2*s.* 6*d.* a ton. There is only a moderate business in steel, but prices have a hardening tendency. A better tone prevails in the shipbuilding trade, and is due to more orders having been placed. Engineers continue well employed. —*Iron.*

**DISCOVERIES AT SILCHESTER.**—The explorations which are being carried out on the site of the Roman city of Silchester, a few miles distant from the Aldermaston or Mortimer stations of the Great Western Railway, under the personal direction of Mr. G. E. Fox, Mr. W. H. St. John Hope, Mr. Mill Stephenson, and Mr. W. K. Forster, of the Society of Antiquaries, are (according to accounts which we have seen, especially a long article in the *Reading Mercury* for the 30th ult.) being attended with most satisfactory results from an antiquarian point of view. Until the present work was known of the great western gate of the city except its site, but the present excavations have disclosed most interesting remains of this gate, under which passed the traffic along the main road through the Roman city. The roadway at the west gate was spanned by two arches. Amongst the massive fragments of the masonry uncovered is the impost of the gate, from which two arches sprang, and the mouldings on one side may be noted out away in order to allow the doors to shut against it. There are found to be two guard-rooms on each side of the gate, those on the south being most perfect. The wall here has a thickness of 10 ft., which decreases as it rises from the ground level, and it is by a great mound of earth. One point for investigation is whether or not this mound is of earlier Celtic origin. A paving of flints forms apparently a pathway to the top of the mound. At the west gate a fragment of a fine Corinthian capital has been found. As it has no connexion with the structure it was apparently brought there for some purpose during the occupation of the city. The remains of the west gate are admirable specimens of masonry, large blocks of oolite and other stone having been employed. A house has been excavated at the north-west corner, the museum, in fact, standing on a corner of it. Traces have been found of another house at the north-east corner. Between the two houses there is a considerable area of open ground. The explorers are led to conjecture that in each square there may have been a certain number of houses with much open ground, consisting of court-yards and gardens. From its size and from the remains it is considered that the house excavated was that of one of the wealthier inhabitants of the city. During the excavations, principally at the *insula*, a large number of objects of antiquity have been unearthed. These have all been carefully labelled and classified, and occupy shelves in the temporary office. The exploration is being carried out with the sanction and approval of the Duke of Wellington, who owns the site of the city, and with the co-operation of the Duke's agent, Mr. Walter Mousley, and the tenant, Mr. Cooper. His Grace has also promised to give the site of the museum and to contribute towards its erection.

**PICTURES AT LIVERPOOL.**—The annual picture exhibition opened this week, the private view being last Saturday. The exhibition includes several of the most noted pictures of the year already exhibited in London; Sir F. Leighton's "Bath of Psyche," Mr. Collier's "Death of Cleopatra" (which does not seem to give much satisfaction, the critic of the *Liverpool Daily Post* rightly complaining that the pathos of the subject is killed by the prominence given to the architectural surroundings), and Mr. Holman Hunt's "Flight into Egypt," about which much sentiment seems to be expended. The exhibition is said to be quite equal to its predecessors, and local artists are well represented.

**PROPERTIES FOR SALE.**—By auction, at Llangollen—(1) Tyndwr, overlooking the Vale, together with the neighbouring Pengwern House and farm lands—extending over 1,053 acres in all, and yielding a rental of about 1,320*l.* per annum. The mansion and Pengwern House will be put up in two lots of 419 and 473 acres respectively; the remaining twenty-one lots consist of various small holdings, all under cultivation. (2) Plas-pen-y-Nant, newly rebuilt, with 140 acres, finely situated, above the Vale and the River Dee. Pengwern Hall was in olden times the home of Tudor Trevor, Lord of Bromfield, circa 925, from whom the Mostyn family claim their descent. By auction at Edinburgh—(3) The Clunie Estate, Perthshire, comprising 1,360 acres (of which 890 are arable), situated in the Stormont District and watered by the Lunan, a tributary of the Loch. The property contains Loch Clunie, wherein is the island of the Ochil Hills, on which George Brown, Bishop of Dunkeld, built a former fastness of the Earls of Arllie. The ruined castle stands a rival to Eillock, or Sanghar, in Dumfries, as the reputed birthplace of the "Admirable" James Crichton (died 1581). On the loch's western side was a hunting-seat of Kenneth MacAlpine, scourge of the Picts. In the parish of Clunie—the Celtic Cluainne, or green pasture among the woods—are numerous tumuli and cairns, vestiges of combats between the natives and the Romans. (4) Invermay, in Strathern; about 3,890 acres, with a rental of 2,642*l.*, excluding the mansion and shootings, at an upset price of 95,000*l.* The house stands on the western slope of the Ochil Hills; its policies stretch to the May's bank, and include the subject of Mallet's ballad, "The Birks of Invermay." That small but beautiful river rises in the Ochils, and, flowing through Forteviot, enters the Earn about a mile above Dupplin Castle. In its course are two celebrated falls: the "Humble Bumble" and the Inn of Muckersie.



Here, too, are some ancient remains: Forteviot formed a Pictish stronghold; on heights above the May are a Roman camp, and close to Forganendy, the large circular stone fort, known as Castle-law, supposed by some to be of Danish construction, overlooking Strathearn and the caise of Gowrie.

**IRON ROOF FOR GREAT RANGES OF TEMPERATURE.**—A description is given in a foreign technical publication (*Zeitschrift des Vereins Deutscher Ingenieure*, 1890, p. 15) of the iron roof for the Finland State Archives Office at Helsinki, which has been designed to withstand the wide ranges of temperature that are experienced in that country. The hall which this roof covers is 72 ft. 5 in. in length, by 43 ft. 2 in. wide. The principals, which are of ordinary construction, are 6 ft. 3 in. deep in the centre, with depressed tie. They are carried on roller bearings at each end, to admit of free elongation and contraction of the exposed roof-surfaces, trusses, and rafters. The ceiling, which is framed in iron, is at a level of 2 ft. 6 in. below this tie-rod, and its rigidity and protection from the excessive variations of the external temperature are secured by the extension of the king and queen rods to a parallel tie below, built into the wall at each end, the intervening space being filled in with brick vaulting.

**TECHNICAL INSTRUCTION AT KING'S COLLEGE, LONDON.**—We have received from Professor Banister Fletcher some particulars of the proposed work of the Department of Technical Instruction at King's College. In Building Construction and Architecture, we learn that the Carpenters' Company, acting in connexion with the Council of King's College, have resolved on establishing at King's College in London, evening lectures on Building Construction and Architecture, and Drawing classes. The lectures will be given on Mondays, from 7.15 to 8.15, by Professor Banister Fletcher. Each course will last twelve weeks or thereabouts. The subjects include Foundations, Brickwork, Building Stones, Timber, its several forms and uses, Iron, and its use in building, Limes, Cements and Concrete, Masonry, Fireproof Construction, Carpentry (roofs and their construction), Plastering and Materials, and Plumbing and Sanitation. The Drawing Classes and Classes of Design will also be held on Mondays, from 8.15 to 9.15, by Professor Banister Fletcher, assisted by a demonstrator. Students nominated by the Carpenters' Company, for either the lectures or the drawing classes, will pay half fees. There will be an examination at the end of each term. The first course will begin on Monday evening, October 6. We also learn that the Carpenters' Company (Hartson's Gift) acting in connexion with the Council of King's College, London, have resolved on establishing at King's College classes for instruction in wood-carving. These classes will be held on Monday, Wednesday, and Friday, in the day from twelve to four, and in the evening from six to nine. The teachers will for the present be Messrs. Barnes, Curratt, and Howard, all practical wood-carvers, and Members of the Institute of British Wood-Carvers. Each course will last twelve weeks or thereabouts. The fees for these lectures and classes will be very low. Professor Banister Fletcher has also sent us the syllabus of the classes of architecture, building construction, and modern practice, which he will conduct in succession to Professor Kerr. These courses are intended to furnish full information in the theory and practice of architecture and building construction, and in the application of the principles of mechanics to construction. They are also specially arranged to enable architects' pupils, improvers, and other gentlemen intending to follow the profession of architecture, to prepare for the progressive examinations of the Royal Institute of British Architects as set forth in their "Kalendar." We learn that in connexion with these classes Professor Banister Fletcher is forming what he hopes will become the most useful architectural and building construction museum in London. In addition to the cost incurred by the Carpenters' Company in relation to this work, they are spending 600*l.*—"Hartson's gift,"—in building a room at King's College for wood-carving, and 150*l.* in improvement to the carpenters' workshop.

#### RECENT PATENTS:

##### ABSTRACTS OF SPECIFICATIONS.

6,355.—CHIMNEYS AND VENTILATION: T. A. Meggison and another.—According to this invention, an outer casing and an inner cone are so arranged that by the passage of the wind an up-draught is caused, and the smoke or foul air exhausted from the shaft.

6,350.—WALLS FOR BUILDINGS: M. Helander.—This invention relates to a method of dispensing with framework in building-up walls by means of plates. Buildings are made so that they are provided with double or multiple walls, forming air-spaces, the walls being built of plates artificially produced in any material containing magnesia, the plates being connected with each other so that they form a rigid self-supported structure.

13,007.—BOLTS, &c.: H. Germond.—By this invention bolts are made with a secret or not observable locking appliance, mainly for the purpose of preventing the unauthorized opening by children, and especially as a safeguard against burglars, as cannot be forced by a jemmy or other sharp tool. A tubular or recessed part of the bolt contains a secret plate locking appliance in combination with a catch on the plate.

10,193.—CLOSEST CISTERNS: G. A. Muller and others.—

This invention relates to cisterns having syphon discharge, the distinguishing feature of the invention being the construction of the stand-pipe in such a form that a portion of it is nominally above the water level, but can be submerged to start the siphon action.

6,222.—SASH-FASTENERS: E. G. Whitehead.—By means of a lever, rod, and spring, a catch is arranged to hold the window-sash in any desired position. The invention is principally useful for railway-carriage windows.

9,239.—BRICKS: D. Hart.—According to this invention, bricks are made of any material or colour, but on one or more sides of each brick, a square-shaped projection is formed the whole depth of the brick, and about one-third of its entire width. On the opposite side are formed cavities corresponding in shape and dimensions with the projections. Thus each brick fits into the other and strength is secured.

##### NEW APPLICATIONS FOR PATENTS.

Aug. 18.—13,922, G. Helmore, Window Sash Fasteners.

12,944, R. Marsh, Decorative and Adjustable Frames for Tiles.

Aug. 19.—13,007, H. Lake, Machine or Apparatus for the Manufacture of Metal Lathing.—13,032, Y. Kneel, Self-flushing Cisterns, applicable to Waterclosets.

Aug. 20.—13,059, H. Lamplough, Paving and Flooring Bricks.—13,105, A. McLean, Decorative Artificial Stone.

Aug. 21.—13,154, G. Abel, Manufacture of Artificial Pipes, Slabs, &c.—13,141, W. Drayson, Waterclosets.

13,155, L. Jahn, Firing of Pottery.—13,156, S. Jenkinson, Protector for Wood-working and other Machines.—13,159, J. Garner and E. Craddock, Air-tight Cover, particularly applicable for Cisterns.

Aug. 22.—13,203, Empson & Hewett, Syphon Flushing Cisterns.—13,216, J. Grainger, Concrete Ventilated Building-block for building purposes.—13,218, E. Greenwood, Ventilating Rooms.—13,227, C. Bonne, Manufacture of Cement, such as Portland or Slag Cement.

Aug. 23.—13,272, E. Hinde, Manufacture of Bricks, or Kirkan, Construction of Kilns or Ovens for Baking or Baking Pottery, Bricks, Tiles, and the like.—13,306, G. Parini, Spring Door Hinges.—13,315, G. Reifman, Roofing Tiles.—13,318, W. Huxley and others, Construction of Windows and Sashes.

##### PROVISIONAL SPECIFICATIONS ACCEPTED.

6,904, G. Martin, Glazing Sash-lights and Skylights.—C. and E. Woodfield, Window-fastening.—9,005, T. Slater, Window-preventer.—9,019, A. Baker, Drains and Sewers.—9,011, T. Parker, Gate Hinges.

Hitchin, Window-fasteners.—10,614, W. Morison, Door-closer.—10,761, L. Pogate, Lime-sifter.—10,944, A. Booty, Ventilators.—11,180, J. Morris and A. Ransden, Flushing Syphons.—11,344, J. Bishop, Ventilation.—12,136, Harries, Grates.—12,301, W. Clark, Syphon Water-waste Preventer.—12,508, F. Pruccette, Flushing Apparatus.

##### COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

15,140, J. Kaye, Relining and Opening Doors.—10,243, J. Schwärmer, Sewer for Traps.

#### SOME RECENT SALES OF PROPERTY:

##### ESTATE EXCHANGE REPORT.

AUGUST 20.—By T. G. Wharton (at Caterham): The residence called "Albert Lodge," and 2*ac.* acres, Upper Caterham, f. 1, 895*l.*

AUGUST 21.—By T. G. Wharton (at Walton): 1 and 2, Anderson's Cottages, and the "Prince of Wales" beer-house, Walton-on-Thames, f. 2,100*l.*

AUGUST 22.—By Debenham, Teason, & Co.: 20, "Ray Lodge," and 2*ac.* 1*r.* 36*p.*, Maidenhead, Berks, f. 20,000*l.* "Allen's," "Dillon's," and "Westlands" Farms, containing 14*ac.* 3*r.* 17*p.*, Cuckfield, Sussex, f. 2,000*l.*; "Ashfold's" Farm, containing 47*ac.* 1*r.* 10*p.*, f. 2,500*l.*; J. K. Coleman: 18, 22, and 30, Upper-st. Plaisant, f. 72*l.* 16*s.* 8*d.*; By Broad & Wiltshire (at Barking): 10, 11, and 12, Back-lane, Barking, f. 85*l.* 2*s.* 2*d.*; 10 and 12, The Broadway, and 2, 3, and 4, Back-lane, f. 53*l.* 16*s.* 8*d.*

AUGUST 27.—By Jones & Sons: 7 to 14, Oley-pl. Stepney, u.t. 50 yds, g.r. 2*ac.*, f. 300*l.* 1*s.* 10*d.*; Lower Chapman-st., St. George's East, an improved rental of 22*l.* 6*s.* 6*d.*, u.t. 10 yds, g.r. 1*ac.* 1*r.* 35*p.*, f. 250*l.* (odd) and 25*l.* and 25*l.*, Ralston-rd., Herne-hill, u.t. 50 yds, g.r. 30*l.*, 1,200*l.*—By J. Hibbard: 4*ac.* 1*r.* 20*p.*, pl. Hoxton, u.t. 41 yds, g.r. 4*l.* 4*s.*, f. 300*l.* 3*s.* 6*d.*; Alma-st., u.t. 44 yds, g.r. 5*l.*, f. 300*l.* 3*s.* 6*d.*—By G. F. Smallpiece (at Woking Station): two f. cottages, Horsell-rd., Woking, f. 10*l.* 10*s.* 3*d.*; By Debenham, Teason, & Co. (at Newport): "Scyborwen" Estate, Llantrissau, Monmouth, containing 41*ac.* 1*r.* 12*p.*, f. 2,100*l.*; the Home Farm, containing 131*ac.* 0*r.* 6*p.*, f. 2,100*l.*; several f. cottages and enclosures, containing 67*ac.* 1*r.* 0*p.*, f. 2,620*l.*

AUGUST 23.—By Newell & Harding: 7, Springdale-rd., Stoke Newington, u.t. 70 yds, g.r. 6*l.* 4*s.* 6*d.*, 300*l.*; 275 and 277, City-rd., St. Luke's, u.t. 45 yds, g.r. 2*l.* 10*s.* 10*d.*, f. 1,100*l.*; 26, Lower Adiscombe-rd., Croydon, f. 1,350*l.*

6,202.—By G. F. Hibbard & Son: "Long Barns" and "Fry's" farms, near Ongar, Essex, f. 2,500*l.* 20*p.*, f. 4,600*l.*—By E. Stimson: 55 and 56, Wootton-st., Lambeth, u.t. 21 yds, g.r. 14*l.* 10*s.*, f. 72*l.* 16*s.* 25*d.*; S. Alkali-st., u.t. 10 yds, g.r. 10*l.* 10*s.*, f. 33*l.* 16*s.* 4*d.*; 14, Uxbridge-rd., Newington Causeway, u.t. 15 yds, g.r. 2*l.* 14*s.*, f. 28*l.* 10*s.*; 16, Uxbridge-rd., u.t. 15 yds, g.r. 5*l.*, f. 28*l.* 10*s.*; 7 and 8, Uxbridge-pl., u.t. 19 yds, g.r. 4*l.* 4*s.*, f. 100*l.*; 83 to 93 (odd) Uxbridge-rd., East Dulwich, u.t. 77 yds, g.r. 14*l.* 15*s.* 4*d.*, f. 250*l.*; 15 and 17, Tidal-st., Camberwell, u.t. 71 yds, g.r. 5*l.*, f. 57*l.* 4*s.* 4*d.*; 154, Wyndham-rd., with goodwill of the inn, chandler, u.t. 19 yds, g.r. 30*l.* 5*s.*, f. 300*l.*; De Beauvoir-rd., u.t. 36 yds, g.r. 14*l.* 15*s.* 4*d.*, f. 250*l.*; 145 and 147, Lorrimer-rd., Walworth, u.t. 63 yds, g.r. 9*l.* 5*s.*, f. 56*l.* 5*s.*; 7, Old-clinton-rd., Peckham, u.t. 87 yds, g.r. 5*l.* 15*s.*, f. 250*l.*; 19, 21, and 23, Tottenham-rd., Nunhead, u.t. 86 yds, g.r. 1*l.* 10*s.*, f. 250*l.*; 225*l.*; 6, Fairview-rd., Sydenham, u.t. 71 yds, g.r. 3*l.* 10*s.*, f. 400*l.*—By M. Long: 56, Pembroke-gardens, Kensington, u.t. 50 yds, g.r. 14*l.* 10*s.*, f. 26*l.* 7*s.* 8*d.*; The Grove, Hammersmith, u.t. 77 yds, g.r. 1*l.* 10*s.*, f. 400*l.*

AUGUST 29.—By Barker & Nield: 34, Radnor-st., Chelsea, u.t. 51 yds, g.r. 40*l.* 4*s.* 6*d.*; By Broad & Wiltshire: 8, Debenhams, Baywater, u.t. 53 yds, g.r. 5*l.* 3*s.* 3*d.*, f. 300*l.*—By J. Reilly: 145, Grove-st., Deptford, u.t. 45 yds, g.r. 2*l.* 2*s.* 2*d.*, f. 27*l.* 6*s.* 6*d.*

(Contractions used in these lists.—F.g.r. for freehold

ground-rent; l.g.r. for leasehold ground-rent; l.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; a. for estimated rental; u.t. for unexpired term; p. for per annum; s. for squire; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

#### PRICES CURRENT OF MATERIALS.

		£.	s.	d.	£.	s.	d.
Greenheart, B.G.	ton	6	10	0	7	10	0
Greenheart, E.I.	load	11	0	0	14	0	0
Sequoia, U.S.	foot cube	0	8	0	3	0	0
Ash, Canada	load	3	0	0	4	10	0
Birch	"	3	0	0	6	0	0
Elm	"	3	10	0	4	15	0
Fir, Danzig, &c.	"	1	15	0	3	10	0
Oak	"	2	10	0	4	10	0
Pine	"	5	10	0	6	10	0
Canada, red	"	2	10	0	3	10	0
" yellow	"	2	0	0	5	0	0
Lath, Danzig	"	6	0	0	7	0	0
St. Petersburg	"	6	0	0	7	0	0
Waincoat, Rigas, &c.	"	0	0	0	0	0	0
Finland, 2nd and 1st. sld.	"	7	15	0	10	0	0
" 4th and 3rd	"	7	0	0	7	10	0
Riga	"	6	0	0	8	10	0
St. Petersburg, 2nd yellow	"	8	15	0	10	0	0
" white	"	7	10	0	9	0	0
Swedish	"	7	0	0	15	0	0
White Sea	"	8	0	0	17	0	0
Canada, Pine, 1st	"	15	0	0	26	0	0
" 2nd	"	10	0	0	16	10	0
" 3rd, &c.	"	7	0	0	10	0	0
" Spruce	"	11	0	0	18	0	0
" 3rd and 2nd	"	6	10	0	8	10	0
New Brunswick, &c.	"	8	0	0	8	0	0
Battens, all kinds	"	5	0	0	16	0	0
English Boards	"	0	10	0	0	14	0
Second	"	0	8	0	10	0	0
Third	"	0	6	0	7	0	0
Cedar, Cuba	"	0	4	0	0	4	0
Honduras	"	0	0	4	0	0	4
Mahogany, Cuba	"	0	0	4	0	0	4
St. Domingo, cargo average	"	0	0	4	0	0	4
Mexican	"	0	0	4	0	0	4
Tobacco	"	0	0	5	0	0	5
Honduras	"	0	0	5	0	0	5
Rose, Rio	"	14	0	0	19	0	0
Bahia	"	13	0	0	18	0	0
Salin, St. Domingo	"	0	0	9	0	0	9
Puerto Rico	"	0	0	9	0	0	9
Walnut, Italian	"	0	0	4	0	0	7

##### METALS.

IRON—Bar, Welsh, in London	ton	6	10	0	6	17	6
" works in Wales	"	6	0	0	8	0	0
Staffordshire, in London	"	7	0	0	9	0	0
COPPER—British, cake and ingots	63	10	0	0	64	10	0
Best selected	68	0	0	0	66	0	0
Sheet, strong	60	0	0	0	70	0	0
Chili, bars	60	0	0	0	0	0	0
YELLOW METAL	lb.	0	0	6	1	0	0
LEAD—Pig, Spanish	ton	13	5	0	0	0	0
English, common brands	"	0	0	0	0	0	0
Sheet, English, 3 lbs. per square foot and upwards	"	15	0	0	0	0	0
Zinc	"	15	10	0	0	0	0
Tin—Strait	"	97	0	0	0	0	0
Australian	"	98	0	0	0	0	0
English Ingots	"	100	0	0	0	0	0

##### OILS.

Lined seed	ton	24	7	6	24	17	6
Cocunut, Cochis	"	34	0	0	0	0	0
Cocunut, Ceylon	"	31	10	0	32	0	0
Palm, Lagos	"	27	0	0	28	0	0
Rapeseed	"	29	15	0	30	0	0
" brown	"	29	15	0	30	0	0
Cottonseed, refined	"	21	10	0	0	0	0
Tallow and Oleine	"	21	0	0	4	0	0
LABRIN, U.S.	"	7	0	0	12	0	0
Tar—Stockholm	barrel	1	0	0	0	0	0
Chargel	"	0	14	6	0	0	0

#### TENDERS.

(Communications for insertion under this heads must reach us not later than 12 noon on Thursdays.)

BECKENHAM (Kent).—For repairs and decorations—"Woodthorpe," Southend-road, Beckenham, Kent. Mr. F. G. Lane. Mr. Edward Brown, architect, 2, Liverpool-street, E.C. F. Cooper (accepted)..... £175 15 0 [No competition.]

BRENTWOOD (Essex).—For building two villa residences, with stabling, near Brentwood, Essex, for Mr. A. Clark, Messrs. Sherrin & Colman, architects.—Turner & Son (accepted)..... £1,450 0 0 Austin..... 1,310 0 0 H. Cornish & Sons (accepted)..... 1,285 0 0

CARDIFF.—For the erection of a Seamen's Institute &c., at Butte-crescent, Cardiff. Mr. E. W. M. Corbett, architect, Castle-street, Cardiff.—Chas. Shepherd & Sons (accepted)..... £4,985 0 0 E. Turner & Sons..... 4,968 0 0 Burton & Co. (accepted)..... 4,495 0 0 James Allan (accepted)..... 4,410 0 0 [All of Cardiff.]

CARLISLE.—Accepted for works in the erection of completion of ten houses in Howe-street, Bothergill, Carlisle, for Mr. Joseph Metcalfe, Mr. Geo. D. Oily, architect, Bank-chambers, Carlisle.—Carpenter and Joiner, T. & J. Nixon, £445 0 0 Plumber, J. Thomson & Son..... 104 0 0 Plasterer, E. M. Drummond & Son..... 185 0 0 Painter, Wm. U. Ballantyne..... 59 0 0 Slater, C. J. Dawson..... 100 0 0 [All of Carlisle.]



COMPETITION AND CONTRACTS.

COMPETITION.

Nature of Work.	By whom Advertised.	Premium.	Designs to be delivered.
New Municipal Buildings.	Oswestry Town Council.	50l. and 20l.	No date

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Two Cottages, Warehouse, and Stable Leads	Mr. J. Skelton.	Thos. Winn.	Sept. 9
Repairs and Rebuildings, Eastleigh, Southampton	Mr. J. J. Budd.	Thos. Stephen.	do.
Reconstruction of Chapel and School, Brigg	Westbury & Son.	do.	do.
Reconstruction of Chapel and School, Brigg	W. A. Gelder.	do.	do.
Reconstruction of Chapel and School, Brigg	W. H. Savage.	do.	do.
Reconstruction of Chapel and School, Brigg	H. Baxton Russell.	do.	Sept. 10
Reconstruction of Chapel and School, Brigg	Sutton (Barry) & B.	do.	do.
Reconstruction of Chapel and School, Brigg	Scarborough Union.	do.	do.
Reconstruction of Chapel and School, Brigg	Northwich Union.	do.	do.
Reconstruction of Chapel and School, Brigg	J. P. Gill.	do.	do.
Reconstruction of Chapel and School, Brigg	Ripley Local Board.	do.	do.
Reconstruction of Chapel and School, Brigg	Cadit Corporation.	do.	do.
Reconstruction of Chapel and School, Brigg	Wm. Harpur.	do.	do.
Reconstruction of Chapel and School, Brigg	Chas. C. Dole.	do.	Sept. 11
Reconstruction of Chapel and School, Brigg	J. Ace Benson.	do.	do.
Reconstruction of Chapel and School, Brigg	Board of Public Wks.	do.	do.
Reconstruction of Chapel and School, Brigg	do.	do.	do.
Reconstruction of Chapel and School, Brigg	do.	do.	Sept. 12
Reconstruction of Chapel and School, Brigg	Wood Green Local Bd.	C. J. Gonyon.	do.
Reconstruction of Chapel and School, Brigg	do.	do.	do.
Reconstruction of Chapel and School, Brigg	Cockermouth Guardians.	G. D. Oliver.	Sept. 15
Reconstruction of Chapel and School, Brigg	Marazion Garrison.	do.	do.
Reconstruction of Chapel and School, Brigg	Tadcaster U.R.S.A.	Brundell-Simmons & Co.	do.

CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Extension of Library Buildings.	Handsworth U.S.A.	W. Henman.	Sept. 15
*Oak Park Fencing.	Battersea Rural Bd.	do.	do.
*Broken Granite Loc. Bd.	N. Walslake Loc. Bd.	do.	do.
*Widening Bridge, Kelling.	G. W. R. Co.	do.	Sept. 16
*General Works, House Drain, &c.	Lorton Local Board.	W. Dawson.	do.
*Drainage Roadmaking, Kerbing, &c.	do.	do.	do.
*Roadmaking and Paving Works.	Fulham Vestry.	W. Byles.	Sept. 17
*Pipe and Brick Sewers.	do.	J. F. Nerrington.	do.
*Paving Works.	Greenwich Bd. of Wks.	Official.	do.
*Wrought-iron Girders, Trough Flooring &c. Supply and Erection of Footbridge.	M. R. Co.	do.	Sept. 18
*Register Office.	Ilington Guardians.	W. Smith.	do.
*Bathrooms and Pipes.	Buxton Local Board.	J. Hays.	do.
*Custom House, Hyth.	Com. of H.M. Wks.	Official.	do.
*Brick and Pipe Sewers, &c.	Sandwich Loc. Bd.	Barrie & Barrie.	Sept. 19
*Reservoir, Tank, Laying Water-pipes, &c.	Stainland with Old Lindley Local Board.	G. A. G. H. Crowther.	do.
Memorial Hall, Brookeborough, Fermanagh.	do.	Thos. Elliott.	Sept. 20
*Public Baths and Washhouses.	Stockton-on-Tees Corp.	K. F. Campbell.	Sept. 22
*Market Hall.	Bilston Township Com.	Horton & Co.	do.
*Infant School, near Abercrombie.	Stroud-on-Avon Bd.	do.	Sept. 23
*Marine Park and Lake.	Southport Corporation.	do.	Sept. 24
*Repairing Manufacturing Buildings.	Messrs. R. Ball & Co.	Official.	Sept. 25
*Telegraph Factory, Mount Pleasant.	Com. of H.M. Wks.	Official.	Sept. 30
New Cathedral, Letterkenny, Ireland.	Bishop of Raphoe.	Wm. Hague.	do.
*Erection of Barrack Buildings, Shorncliffe.	War Department.	Official.	No date
*Shaking Shaft (170 shafts).	Tunstall Local Board.	A. H. Wood.	do.
Restoration of Church, Llanfared, Radnorshire.	Trumdon (Durham) Coal Co.	do.	do.
*King's College, Ealing Road, N. Leeds.	Ernest Collier.	do.	do.
Sixteen Houses, Leeds.	Birley Guardians.	do.	do.
Methodist Church and Schools, Leicester.	Jan. Charles & Sons.	do.	do.
New School.	A. H. Goodall.	do.	do.
Ironwork for Spinning Mill, Heywood.	Norwich Training Coll.	do.	do.
Two or Four Dwelling-houses, Sheffield.	Potts, Son, & Pickup.	do.	do.
do.	J. F. Eadie.	do.	do.

Those marked with an Asterisk (\*) are advertised in this Number. Competition, p. iv. Contracts, pp. iv. and vi.

ASTLEY DOUGLAS, N.B.—For providing and laying water-pipes and executing drainage purification works Castle Douglas, N.B., for the Local Authority. Mr. S. Barr, Engineer, 23, West Regent-street, Glasgow, W. Gibson, Halmellington, £2,970 0 0  
Parker & Sharpe 3,049 10 6  
J. Morris & Sons 3,021 3 6  
J. & S. Rae 3,003 19 3  
E. C. Brebner 2,999 0 0  
Sharpe 2,918 12 2  
W. J. Flett 2,813 3 0  
J. Carter 2,674 4 2  
Pearson, Kilmarnock (accepted) 2,569 11 2  
[Engineer's estimate, £2,682 3s. 7d.]

BESTER-LE-STREET (Durham).—For rebuilding in cement concrete portions of a retaining wall at Water Burn, Chester-le-Street, for the Durham and Chester-le-Street Highway Board. Mr. J. McGregor, District Surveyor, Arkley Hough, near Durham, £170 0 0  
Goldsbrough & Kell 142 10 0  
John T. Simpson 138 10 0  
John Carrick, Durham (accepted) 138 10 0

HSWICK.—For the erection of a mission hall, che, &c. Mr. C. P. Edwards, architect, 7, Victoria-street, Westminster, S.W. Quantities by Mr. T. Wood-ge Biggs :—  
E. Hydmann, jun. £2,670 0 0  
Chamberlens Bros. 2,314 0 0  
J. Edwards & Son 2,300 0 0  
Adamson & Sons 2,265 0 0  
W. Oldrey & Co. 2,260 0 0  
H. Fowler (informal) 2,241 0 0  
W. & A. Atkinson 2,218 0 0  
J. J. Bryant 2,050 0 0  
S. Powell (accepted) 1,970 0 0

LANE (co. Kildare).—For building Medical Officer's residence at Clane, co. Kildare, Ireland, for the Board of Guardians of the Union. Mr. Joseph Berry, C.E., 11, Mountjoy-square, Dublin :—  
J. Good £1,047 0 0  
J. Hyland, Naas (accepted) 1,020 0 0

ARTFORD (Kent).—For repairs to ten houses and erecting of new drains, &c. :—  
Collins 2,425 0 0  
W. Francis & Co., Lacon-road, Dulwich (accepted) 418 0 0

LITTLEHAMPTON (Sussex).—For erecting school house for Mr. Barford :—  
Rowland Bros. £2,510 0 0  
E. Peters 2,650 0 0  
Snewin Bros. 2,635 0 0  
A. Burrell 2,580 0 0  
Turtill & Appleton 2,450 0 0  
W. H. Sawle, Worthing (accepted) 1,966 0 0

ONDON.—For alterations, repairs, &c., to the residence of Mr. R. E. Cruwys, architect, 10, Chambers, 465, Brixton-road, S.W. Quantities by Messrs. Franklin & Andrews, 25, Ludgate-hill, E.C. :—  
Chappell £4,578 0 0  
Turtill & Appleton 4,410 0 0  
McLachlan 4,393 0 0  
Patrick & Son 4,318 0 0  
Higgs & Hill 4,200 0 0  
Candler & Sons 4,200 0 0  
Nightingale 4,169 0 0  
Burman & Sons 4,049 0 0  
Downs 3,984 0 0

ONDON.—For alterations and repairs to the residence of Mr. R. E. Cruwys, architect, 10, Chambers, 465, Brixton-road, S.W. Quantities by Messrs. Franklin & Andrews, 25, Ludgate-hill, E.C. :—  
Walker 539 0 0  
Greenwood 496 0 0  
Holloway 494 0 0  
Treweke 448 0 0

LONDON.—For rebuilding Nos. 53 and 55, Little Cadogan-place, S.W. Mr. J. Emes, architect, 151, Ebury-street :—  
Roberts £2,267 0 0  
Gladding 2,200 0 0  
Oldrey 2,177 0 0  
Nichols 2,100 0 0  
Castle 2,065 0 0  
Hewitt 2,050 0 0  
Simmonds Bros. 1,888 0 0  
Craske (accepted) 1,839 0 0  
Kayment (withdrawn) 1,620 0 0

LONDON.—For taking-up an existing brick sewer in Hemmings-row, Charing Cross, and for the construction of a 4 ft. by 2 ft. 8 in. egg-shaped brick sewer in lieu thereof, including bell-mouth junctions, side entrance, and other works appurtenant thereto, for the Vestry of St. Martin-in-the-Fields, Westminster. Mr. Charles Mason, Surveyor to the Vestry :—  
Geo. Bell £654 3 9  
Mowlem & Co. 540 0 0  
A. Kelleit 531 14 6  
Mayo & Co. 510 4 0  
J. Garton 440 14 0  
J. H. Neave, Fulham-park-gardens, Fulham-road (accepted) 429 14 6

LONDON.—For the erection of new workshops in rear of 96, Borough-road, S.E., for Messrs. P. B. Well, Messrs. Page & Stock, architects. Quantities by Messrs. Widnell & Trollope :—  
Porter £830 0 0  
Canning & Mullin 875 0 0  
E. C. Scott (accepted) 860 0 0

LONDON.—For alterations at the Hoborn Gladstonian Club, Devonshire-street, W.C. Mr. T. F. Holland, architect, 3, Little George-street, Westminster, S.W. :—  
Pickford & Co. £388 0 0  
Young & Lonsdale (accepted) 388 0 0  
Clifford 361 15 9

LONDON.—For erecting new warehouses, Nos. 21 and 23, Mitre-street, E.C. Mr. M. E. Collins, architect. Quantities by Messrs. Batstone Bros. :—  
Martin, Wells & Co. £4,800 0 0  
Ashby Bros. 4,533 0 0  
T. Boyce 4,468 0 0  
F. & F. Wood 4,450 0 0  
Lascelles 4,270 0 0  
Ashby & Horner 4,200 0 0  
Hallamere & Son 4,129 0 0  
W. Shumrun 4,085 0 0  
Ward & Co. 3,967 0 0

LONDON.—For alterations and additions to the Upper Clapton Congregational Church and Schools. Mr. W. D. Church, architect :—  
Dove Bros. £4,200 0 0  
J. H. Holloway 4,060 0 0  
Woodward & Co. 3,890 0 0  
W. Shumrun 3,780 0 0

LONDON.—For building public hall for the South Bermondsey Institute, Rotherhithe New-road, S.E. Mr. T. Aubrey, architect. Quantities by Messrs. Mills & Jones, Regent-street :—  
A. White & Co. £2,035 0 0  
Gregory & Co. 1,944 0 0  
Hart Bros. 1,868 0 0  
Romeo 1,859 0 0  
Holloway 1,844 0 0  
B. Wells 1,799 0 0  
Battley (accepted) 1,727 0 0

LONDON.—For alterations at "The King's Arms," Commercial-road East, for Mr. Medworth. Mr. J. W. Brooker, architect :—  
Battley £280 0 0  
Garrett 878 0 0  
Shumrun 873 0 0  
Holland 845 0 0

LONDON.—For alterations at the "Northumberland Arms," Southwark-park-road, for Mr. John Lipman. Mr. Edward Brown, architect, 21, Liverpool-street, E.C. :—  
S. Pocock (accepted) £350 0 0  
[No competition.]

LONDON.—For marble mosaic paving at St. James's Church, Spanish-place. Messrs. Goldie, Child, & Goldie, architects, Kensington-square :—  
Mainzer & Kempthorne, 18, Berners-street (accepted) £178 10 0

LONDON.—For building stables, &c., at 31, Mowlem-street, Cambridge-heath, for Mr. F. Garner. Mr. Edward Brown, architect, 21, Liverpool-street, E.C. :—  
B. Hemmingsway £283 0 0  
Mower & Son 271 0 0  
S. Goodall 260 0 0  
Walker Bros. 257 0 0  
J. A. Taylor 249 0 0  
A. Hood 229 0 0  
S. W. Hawkins 228 0 0  
R. Edwards, jun. 175 0 0  
W. Jackson (accepted) 145 0 0

LONDON.—For decorations and sanitary work to 27, Elvaston-place, Kensington. Messrs. Sherrin & Coleman, architects :—  
H. Cornish & Sons (accepted) £320 0 0

NEWPORT (Mon.).—For the erection of a new infant's school at Upper Cwmbran, near Newport (Mon.), for the Llanvrechva Upper School Board. Mr. E. A. Lansdowne, architect, High-street, Newport, (Mon.) :—  
H. B. Sketch £1,804 0 0  
J. Linton 1,580 0 0  
A. H. Bailey 1,530 0 0  
J. Jenkins 1,360 0 0  
H. W. Parfitt 1,270 0 0  
R. Wilson, Pontnewydd (accepted) 1,242 3 6

NOTTINGHAM.—For the erection of three shops, bakery, stabling, &c., at Stapleford, near Nottingham. Mr. T. W. Latham, architect, Sandiacre, near Nottingham :—  
Webster & Gelsthorpe, Hucknall £1,266 0 0  
J. Bull, Long Eaton 1,160 0 0  
F. Perks & Son, Long Eaton 1,155 0 0  
J. W. Priestley, Nottingham 1,112 0 0  
G. Bastable, Sandiacre 1,095 0 0  
C. Mout, Stapleford 1,084 0 0

NOTTINGHAM.—For the erection of two houses at Beeston, near Nottingham. Mr. T. W. Latham, architect, Sandiacre, near Nottingham :—  
Bull £1,681 0 0  
Young 1,040 0 0  
Perks, Long Eaton (accepted) 985 0 0  
Fletcher 893 0 0

PLYMOUTH.—For the erection of additional show rooms and stores, &c., at Plymouth, for Messrs. Service & Co. Mr. James Harvey, architect and surveyor, Bedford-chambers, Bedford-street, Plymouth :—  
J. H. Palmer £867 0 0  
W. S. Warren 630 0 0  
G. B. Turpin 611 0 0  
J. Paxon 568 0 0  
Lethbridge & Son 580 0 0  
Palk & Partridge 577 0 0  
Pellow & Jago 570 0 0  
J. H. Blackall 557 0 0  
Tozer & Son 557 0 0  
S. Roberts 555 0 0  
T. May 547 0 0  
Pellow & Frouth 536 0 0  
Wm. Trevena 534 0 0  
C. J. Payne 510 0 0  
W. E. Blake 498 0 0  
W. T. Bone 489 0 0  
A. N. Coles (accepted) 459 0 0  
[All of Plymouth.]

**PLASHET, (Essex).**—For boundary walls, drainage, &c., at the Industrial Schools, Plashet, for the Guardians of the Parish of St. George-in-the-East. Messrs. Wilson, Son, & Aldwinckle, architects. Quantities supplied:—  
 Staines & Son ..... £3,426 0 0  
 Taylor, A. & Co. .... 3,131 13 0  
 Wilton, C. .... 2,879 0 0  
 Todd, G. E. .... 2,863 0 0  
 Holland, J. (accepted) .. 2,655 0 0

**PLYMOUTH.**—For re-building premises, No. 10, Treville-street, Plymouth, for Mr. J. White (exclusive of plumber and gasfitter, smith and ironfounder). Mr. James Harvey, architect. Quantities by the architect:—

P. Blowey, Plymouth .....	£590 0 0
J. P. Berry, Plymouth .....	£80 0 0
S. Roberts, Plymouth .....	563 0 0
S. W. Sanders, Plymouth .....	550 0 0
T. Kennedy, Plymouth .....	520 0 0
A. N. Coles, Plymouth .....	493 0 0
T. May, Plymouth .....	498 0 0
Laphorne & Goad, Plymouth .....	498 0 0
Jenkin & Son, Devonport .....	493 0 0
Reed, Blight, & Co., Plymouth .....	493 0 0
G. Shellabear, Plymouth .....	492 0 0
Lethbridge & Son, Plymouth .....	475 0 0
Toner & Son, Plymouth .....	464 0 0
W. Pellow, Plymouth .....	445 0 0
W. Trevena, Plymouth .....	444 0 0
S. Harvey, Plymouth (accepted) ..	434 0 0

**SALTASH.**—For the erection of Wesleyan Chapel and Sunday Schools, at Saltash. Mr. H. J. Snell, architect, 23, Courtenay-street, Plymouth:—

Tozer & Son .....	£4,400 0 0
J. P. Berry .....	4,200 0 0
T. May .....	3,973 0 0
R. T. Jenkin .....	3,970 0 0
G. Shellabear .....	3,850 0 0
J. T. Brooking .....	3,848 0 0
W. T. Bone .....	3,839 0 0
Laphorne & Goad .....	3,803 0 0
Palk & Partridge .....	3,864 0 0
A. R. Lethbridge & Son .....	3,830 0 0
Reed, Blight, & Co., Limited .....	3,674 0 0
W. Trevena .....	3,647 0 0
J. Finch, Plymouth .....	3,628 0 0

\* Accepted subject to reduction.

**SIDDLICK.**—For the erection and completion of thirty dwelling-houses, at Siddick, near Workington, Cumberland. Mr. J. S. Moffat, architect, 53, Church-street, Whitehaven:—

Thomas Maudie .....	£4,248 0 0
Jonathan Young .....	4,220 0 0
James Couthard .....	4,092 0 0
James Fletcher, Workington* ..	3,610 0 0

\* Accepted.

**SOUTHAMPTON.**—For constructing the new pier at Southampton. Mr. James Lemon and Mr. E. Cooper Poole, joint engineers. Quantities supplied by Mr. J. H. Bizard and Mr. H. J. Weston:—

J. Mowlem & Co., Westminster ..	£23,283 0 0
E. Howell, Poole .....	29,611 0 0
E. C. Frere & Co., London .....	29,559 0 0
E. J. London & Co., Newport ..	28,880 0 0
Mon. ....	27,425 0 0
J. W. Roe & Co., Southampton ..	26,438 0 0
Morgan, Isled, & Morgan, Southampton ..	26,247 0 0
J. Bull, Sons, & Co., Southampton ..	26,180 0 0
A. Thorne, London .....	26,142 0 0
H. J. Sanders, Southampton .....	26,142 0 0

[Engineers' estimate, £29,600.]

**SOUTH SHIELDS.**—For the erection of police-courts, fire brigade depot, residence for chief constable and officers' quarters, at South Shields, for the South Shields Corporation. Messrs. Atkin & Bulmer, architects, Leeds:—

W. J. Robertson .....	£15,330 0 0
R. Goodwin & Son .....	13,142 0 0
C. Nichol .....	13,036 0 0
Obank & Sons .....	12,893 0 0
Haswell & Wolf .....	12,820 0 0
Tyne & Graham .....	12,050 0 0
Simpson .....	11,567 0 0
Reid, Blight, & Co. ....	11,963 0 0
R. Allison .....	11,913 0 0
Middlemas Bros. ....	11,050 0 0
R. D. Scott .....	11,618 0 0
J. Elliot .....	11,580 0 0
Armistead & Hodgson ..	11,487 0 0
J. Howe, West Hartlepool* ..	10,985 0 0

\* Accepted.

**TOTTENHAM.**—For alterations and additions at the "Antwerp Arms," Church-road, Tottenham, N. Mr. John E. Rider, architect, Bridge House, South Tottenham:—

Yardley & Son .....	£673 0 0
F. Vollar .....	658 0 0
H. Knight .....	685 0 0
J. Linzell .....	672 0 0
Stockwell .....	450 0 0

**TUNBRIDGE WELLS.**—For the erection and completion of three attached houses, for the Hon. J. M. O. Jyng, J.P. Mr. W. B. Hughes, architect, Tunbridge Wells:—

Penn Bros. ....	£4,920 0 0
T. Ryder .....	4,420 0 0
R. Langridge .....	4,399 0 0
White & Humphreys .....	4,398 0 0
Strange & Sons .....	4,386 0 0
J. Jarvis .....	4,373 0 0
R. Avard, Maidstone (accepted) ..	4,293 0 0

**WOOD GREEN (Middlesex).**—For alterations at the "Lordship Tavern," Lordship-lane, for Mr. J. C. Pitt. Mr. E. Howard, architect and surveyor, Tottenham:—  
 F. Vollar ..... £695 0 0 || Yardley & Son ..... | 655 0 0 |
| A. Monk (accepted) ..... | 635 0 0 |

*Shop and Warehouse, Wrexham.*—List of tenders for this work has been sent without sender's name being communicated to us, and therefore is ineligible for insertion.

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#### TO CORRESPONDENTS.

J. S. M. (we do not insert lists of tenders without the amounts).  
 —W. C. (small). T. G. (no answer to J. S. M.).—C. G. (no space this week).  
 —H. (we have no space for "duplicated" letters).—O. A. A. (hardly worth notice).  
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 Oak Wood Tapestry Dadoes, from 1s. per foot super.  
 Walnut or Mahogany, from 1s. 3d. per foot super.  
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Design Submitted by Signori L. Broggi & G. Sommaruga, Architects: Front and Side Elevations, Section, and Ground Plan	Double-Page and Single-Page Ink-Photo's.
Design submitted by Signor Moretti, Architect: Principal Elevation	Single-Page Ink-Photo.
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## Pavements and Roads.

**T**HE book published under this title\* contains the results of a special inquiry into the subject set on foot by the New York technical journal named on the title-page, and which has apparently been induced by special circumstances to enter with remarkable earnestness on the collection of statistics in regard to pavements and roads. Those who may have been in New York a few years since can probably endorse the view we advance, and the opinion of most people, viz., that for its size and importance, it was the most disputably paved city in the civilised world. A very large sum (3,000,000 dol.) has, however, been voted to place it more on a par with other places, and the subject has consequently become one of exceptional interest there as well as in other American cities. In the course of its search for special knowledge, the *Engineering and Building Record* of New York has amassed a large amount of evidence from many quarters; and, without expressing any very particular opinions, or indicating any sort of bias, it has been good enough to compile everything which it has obtained relating to the subject which was likely to be of practical utility into a volume of over 400 pages, bringing it quite up to date in these matters. It also instituted a competition, with prizes of 15*l*., 10*l*., and 5*l*., for essays on the subject, and received as many as twenty-one, three of which have been published, in a more or less condensed form, in the volume; extracts have also been made from several of the others where a point of value happened to have been introduced. We have had to rely so long in England on Clark and Law's work as the standard authority on roads and streets, in which several of the chapters, which should be most important, were written so long ago as to be now obsolete, that we have the less hesitation about treating at some length the consideration of the work now under review.

The first part of the work more especially relates to streets, and comprises chapters on

stone, wood, asphalt, and brick pavements,—firstly, for the carriage-ways, and, secondly, for the footways; the first cost, the cost of maintenance, and specifications of each kind are noted and commented on. The second part is devoted entirely to roads, and the third part to the above-mentioned essays. England, France, and Germany are chiefly taxed for the information comprised in the work, but the experiences of the Department of Public Works in India are occasionally alluded to, and, in fact, one of the essays is by a gentleman who was employed in that Department for many years. The book commences with a valuable memorandum from Mr. Clement Dunscombe, detailing the work in Liverpool streets, more particularly with respect to stone. With regard to the foundations for paving first-class streets in that city, the concrete is made in an exceptional manner, as follows:—

"The ground having been excavated, thoroughly consolidated, and properly graded to the requisite depth and shape, a layer of broken stone (or other material) is spread evenly over the surface, and thoroughly wetted from the rose of a watering-can. A stratum of mortar (1 part by measure of cement to 5 or 6 parts gravel, thoroughly mixed dry, and only enough water then allowed to flow on it to make the material damp enough after it is incorporated to retain its form when a portion is taken in the hand and pressed) is spread over this, and a second layer of stone added. The stone is then beaten in with a heavy flat beater. Other layers of mortar and stone are added, and thoroughly beaten in until the required thickness is obtained, the final layer of cement mortar (to complete the full specified thickness of 6 in.) being smoothed off to an even and uniform surface."

The quantity of broken stone is equal to that of the cement and gravel, and has to pass through a 2½-in. ring in every direction, and be clean and free from foreign matter. The gravel has also to be clean, and excludes all stone which will not pass a 1-in. ring, but includes sand. The cement must not leave more than 10 per cent. residuum on a No. 60 wire sieve, and give a tensile strength of 400 lbs. per square inch after seven days immersion. The concrete must set for ten days before paving is begun upon it. Mr. Dunscombe attached a high value to the accurate gauging of setts, considering that if the gauging was done at the quarries, even though the cost might be thereby increased to the extent of 1*s*. 6*d*. per ton, a considerable eventual saving resulted, as the width of the joints of the setts cannot be too small. He believed that wide joints were on many

grounds open to objection, and that where these joints are grouted in lime or cement instead of pitch and creosote oil, they often become receptacles for all filth. He considered that it was a mistaken notion to suppose that the width of the joints made the pavement in any way safer, as it was the inequalities of the sets which gave sufficient foothold.

The Liverpool traffic is very considerable, and it is interesting to compare it by the rule frequently accepted (of tons per yard width of carriage-way per diem) with that of certain London streets, which are given further on in the work, on information chiefly obtained from a paper written by Mr. Howarth, M.I.C.E.:—

	Tons.
Liverpool... Bath-street and New Quay ..	1,150
London... Parliament-street .....	1,108
"..... Oxford-street (average) .....	1,085
Liverpool... Great Howard-street .....	981
London... Leadenhall-street (average) ..	904
Liverpool... North John-street .....	692
London... Brompton-road .....	648
Liverpool... Lord and Church streets (average) .....	458
London... Regent-street .....	558
"..... King's-road (average) .....	500

The stone paving in Liverpool is executed entirely by Corporation workmen, and with the most durable stone procurable, and, as an instance of the economy which results from the adoption and retention of this principle, it is stated that setts taken up in North John-street (above mentioned) after fourteen years' wear showed no measurable amount of wear.

The setts for the various classes of streets vary as follows:—

	L.	B.	D.
For first-class streets ...	3¼" × 3¼"		× 6¼"
Ditto with exceptionally heavy traffic .....	3½" × 3½"		× 7¼"
Second class .....	4" × 4"		× 4"
	or 3" × 5" (to 7")		× 6½"
Third-class .....	4" × 4"		× 4"

One-quarter of an inch in deviation is allowed in these dimensions. The joints of the setts are filled with hard, clean, dry, fine shingle, and the setts rammed until the joints are full, when they are run with a hot mixture of coal-pitch and creosote oil, and the whole covered with half an inch of sharp gravel. The original cost is as follows:—

First class, per superficial yard...	13 <i>s</i> . 6 <i>d</i> .
Second " " "	9 <i>s</i> . 9 <i>d</i> .
Third " " "	8 <i>s</i> . 4 <i>d</i> .

This includes concrete foundations, &c.;

\* "Pavements and Roads." Reprinted from the *Engineering and Building Record*, New York.

but it is doubtful whether it includes establishment charges, and there is, of course, no contractor's profit to reckon for.

To this valuable contribution are attached a series of excellent sections illustrating the different classes of street-pavings of Liverpool.

Now, in connection with the re-paving of New York under the three-million-dollar vote, it was specified by the Special Commissioner that 1-in. joints would be permitted, and he went so far as to say that although from 8 in. to 12 in. was specified for the length, they might be as much as 25 in. in length without harm. For this opinion he was very properly taken to task by the *Engineering and Building Record*, who "regretted that so competent an executive officer should so far forget himself as to talk on a subject on which he cannot be expected to be an expert (and evidently has a great deal to learn), and announce the dangerous doctrine that the department's specifications are not expected to be enforced." Other persons lashed out in the press on the same subject, and it is evident that the public eye was wide awake and intelligently watched the execution of this important work.

Cincinnati followed suit with a vote of 2,000,000 dols. (part for stone and partly for asphalt pavement), and other American cities for large amounts. Topeka, Kansas State, determined to use a large quantity of Sioux Falls stone, which, after a long wrangle there and elsewhere, was determined to be called granite. It is in reality a quartzite, and far more nearly allied to sandstone (though much tougher) than it is to granite, but it is not surprising to hear of its being spoken of as "granite," which often seems to be taken to mean anything except common stone. Amongst the many published comparisons on this work between various kinds of pavements for streets, is one by Mr. P. Rice, City Civil Engineer of Cleveland, Ohio, between asphalt and stone, and he sums it up as follows:—"In discussing sheet pavements, i.e., asphalt, a standard of comparisons might be outlined as follows:—First, moderate cost; second, durability; third, resistance; fourth, secure foothold for horses; fifth, healthfulness; sixth, noiselessness." With due deference to Mr. Rice, such order of importance must vary in accordance with the nature of a street, the fifth and sixth items, and especially the sixth, having frequently primary importance. However, he continues as follows:—"First, sheet pavements do not satisfy the first requirement much better than dressed block; second, I should give dressed block the preference as regards durability and ultimate cost; third, the resistance to traction is undoubtedly less on sheet pavements; fourth, such few experiments as have been made indicate fewer accidents to horses on sheet pavements than on granite, but do not think it would hold good for medina (a hard sandstone); fifth, both sheet pavements and dressed blocks are healthy, and the asphalt filling of the latter fulfils all sanitary requirements; sixth, sheet pavements, perhaps, fulfil the last requirement better than stone, but there is the sharp click and ring of the horse's foot, although the vehicle itself makes little noise. In making repairs in the case of a stone pavement 60 to 75 per cent. of the old material can be used over again, but in the case of a sheet pavement it is worthless." Finally, he advised against laying asphalt pavements in any of the thoroughfares of Cleveland.

Mr. Rice was soon taken up by the asphalt men, one of whom, Mr. E. P. North, of New York, said that putting first cost and durability first was equivalent to a man "dressing himself in flannel shirt and stagey boots." He argued that noiselessness and minimum resistance to traction were closely associated with healthfulness in pavements, for the nearest approach to a perfect pavement, in a sanitary view, seemed accomplished by a pavement which was impervious to fluids, presented no inequalities in which solid and fluid fecal or other matter can lodge, and admitted of cheap and thorough cleaning. He

said that "there was another point which should not be overlooked: horses, besides doing more work, last longer, and there is less expense in repairing running gear and harness on such pavements than on any other."

The same gentleman drew a pleasing picture of the condition of the streets of some American cities as follows:—

"In New York, which may be regarded as the capital city of this country, one sighs for the quiet and repose of an active boiler-shop when the garbage carts of the city pass through its best residence streets; and Philadelphia, the home of our oldest and stateliest families, has 'pavements fringed with murderous stones.' And in most of our cities one can count, in the words of Coleridge, 'two-and-seventy stenches, all well-defined and genuine stinks,' any pleasant summer day."

He however excepted Washington and Buffalo.

Whilst on the subject of stone paving, we notice some well-selected extracts from the periodical statistical reports of Colonel Haywood. From them we gather that the average annual cost (entire) of granite paving in the City for about thirty-three years back has been 93d. per square yard, as against 2s. 03d. for wood. This includes cost of construction plus cost of maintenance, the duration of granite being taken at twenty-five years and of wood about seven years. On London Bridge, with its enormous traffic, granite lasted twelve years, the wear in that time being 2 in., and the cost 2s. 3d. per square yard per annum. In the Poultry the wear on granite was 1½ in. in six years. (Nature of granite not stated, though a matter of very considerable importance.)

There is a gentleman whose writings are frequently quoted throughout this work, who appears to have made paving and road work a special study, and who is apparently an indefatigable collector of statistical information on the subject,—a certain Captain F. V. Greene, of the United States Corps of Engineers. This writer briefly states that,—

"The average life of granite blocks under heavy traffic in London is fifteen years, during which time the wear is about 2 in., when the edges become so rounded that the pavement is as rough as cobble stones. They can then be taken up, redressed, and laid on streets of lighter traffic, when they will last for twenty years more, during which time the wear is another 2 in. The blocks are then so worn that they have not a sufficient depth for a pavement surface, but can be sent to the crusher and broken up for concrete."

There is very little doubt that the damage to vehicles and the increase to traction demand a re-dressing of granite blocks more frequently than is customary, but workmanship on granite is so expensive that the operation is put off as long as possible, until, in fact, the paving is (as described by Captain Greene) similar to cobble stones, and its reputation seriously damaged. In St. Louis some experiments on the durability of street materials were made a few years ago by rolling a two-wheeled cart backwards and forwards over two strips of the pavement under test, each of which were 22 in. wide. The tires were each 2½ in. wide, and loaded up to 800 lb. per inch, or nearly 2 tons total weight. The samples were weighed before and after testing, and after a test equal to 8½ years traffic, the granite blocks had worn scarcely appreciably, while limestone had lost 10 per cent., asphalt blocks 14 per cent., and fire-brick 9 per cent. of their thickness, many of the latter being broken.

Comparisons of other kinds between various classes of paving will be treated on at the close of this article, but we will now turn to what is recorded in this volume about wood pavements. The subject is commenced by reprinting entirely the paper which was read by Mr. G. H. Stayton in 1884 before our Institution of Civil Engineers, together with the discussion which took place thereon. From this valuable paper it appears that there were at that time in London no less than 1,718 miles of streets in the charge of various authorities (in addition to 248 miles not yet taken over), giving a total of nearly

2,000 miles, and that they were covered in the following manner:—

Asphalt	.....	133	miles.
Wood	.....	53	"
Granite	.....	280	"
Macadam	.....	573	"
Flints or gravel	.....	798½	"
		1,718	

and that 40,000 vehicles and 100,000 horses were employed. The author very pointedly remarked that as the estimated value of the vehicles, horses, and their harness was about 5,000,000l., the wear and tear, i.e. annual loss, must depend largely on the condition of the carriage ways. This is a point often alluded to, but scarcely appreciated, or indeed capable of being estimated, until we find ourselves in the presence of such a large figure as five millions sterling. Now, in tractive power alone, we find (by reference to Captain Greene's observations published in this work) that the various experiments made by Moring, MacNeil, Romford, Gordon, and others, give the following results:—

10 lbs.	of tractive force are required to draw 1 ton on level ground on iron.
15 "	of tractive force are required to draw 1 ton on level ground on asphalt.
21 "	of tractive force are required to draw 1 ton on level ground on wood.
33 "	of tractive force are required to draw 1 ton on level ground on best stone blocks.
50 "	of tractive force are required to draw 1 ton on level ground on inferior stone blocks.
90 "	of tractive force are required to draw 1 ton on level ground on average cobble stones.
100 "	of tractive force are required to draw 1 ton on level ground on macadam.
200 "	of tractive force are required to draw 1 ton on level ground on earth.

It is a singular commentary that in comparing this table with that of the mileage of the London streets we see that the largest proportion of street is paved with the material which requires the greatest exercise or waste of power on the part of the horses, and *vice versa*. The same holds good, of course, of the strain on the harness. Taking the proportional value of the horses and harness in London at four millions, it may be estimated that if the gradients and other conditions were suitable for such a description of pavement, the saving on horses, harness, and vehicles by using asphalt in place of any other material would, after allowing for the proportionally greater traffic on some of the streets paved with asphalt and wood over those paved with other materials, would be equal to about half a million sterling per annum, which would represent an approximate average of £300 per mile of street per annum in cost of maintenance! or, in other words, if the saving in transportation is proportional to the load carried, there would be a saving of the power of about 12,000 horses on the number now required for the London work. Captain Greene worked out similar details for New York, and reported that the transport in the streets of that city cost 22 cents per ton-mile, and that by railway ⅓ of a cent per ton-mile, or as 1 to 36, a somewhat remarkable difference. But even discarding those cases in which, owing either to gradient or to other causes, it is not considered advisable to use the better classes of pavement, it is manifest that the great indirect saving in cost of traction must go far to counterbalance the increased cost (if any) of the maintenance of such pavements.

Mr. Stayton's paper on wood pavements, and the experience of Washington, U.S.A., tend to show the extreme importance of a good concrete foundation, the last-named city having founded their wood pavements so badly that after an expenditure of four million dollars, the wood as a pavement lasted so short a time that it was quite discarded, and has been very much, if not entirely, replaced by asphalt. In Chelsea the total cost of the wood pavement averaged 10s. 4½d. per yard. Many trials of various woods are recorded, and the blocks found most suitable were those cut from Swedish yellow deals (Gothenburg thirds); but the result of heavy traffic upon various kinds of wood unquestionably demonstrated that of



hard woods, pitch-pine takes a high place: the price, however, was considerably in advance of fir, and the irregular sizes of the deals created much difficulty. All work in Chelsea was executed by the workmen of the Vestry, the blocks being supplied by contract. Mr. Stayton urged that ample and competent supervision should be provided against the acceptance of unsound blocks. He said:—"The operation of inspecting each block is undoubtedly tedious: for example,

hurry of the work, many blocks were laid which escaped rejection, but assuredly these will be the first to fail." Mr. Stayton's researches enabled him to produce some very instructive statistics on cost and on wear, which are well worthy of examination. From them we have prepared the annexed tables: (a) of first cost, (b) of relative wear, and (c) of proportional relative cost of the wood pavements in those streets in London which are recorded in the work under review:—

A.—COST OF WOOD PAVEMENTS IN LONDON STREETS.

By whom laid.	Place.	Cost per square yard.	Number of years guaranteed free of cost to Vestry.	Contract for maintenance per square yard per annum for x years.
Asphaltic Wood Company	Oxford-street.....	s. d. 13 6		s. d. 1 2 for 15 yrs.
Ditto	Strand.....	13 6		1 0 for 12 yrs.
Ditto	Fleet-street.....	15 0		
Ditto	Regent-street.....	12 6		
Ditto	Brompton-road.....	13 9		
Henson's Wood Company	Oxford-street.....	16 6 (1)		1 0 for 15 yrs.
Ditto	Ditto.....	14 0 (1)		1 0 for 12 yrs.
Ditto	Ditto.....	16 6 (1)		
Ditto	Brompton-road.....	12 9	8	
Ditto	Fleet-street.....	15 0		1 0 for 15 yrs.
Ditto	Leadenhall-street.....	18 6	2	1 7 for 19 yrs.
Ditto	Euston-road.....	11 6	3	0 8 for 17 yrs.
Improved Wood Company	Ludgate-hill.....	18 0 (2)	1	1 6 for 15 yrs.
Ditto	Aldersgate-street.....	15 0	2	1 0 for 15 yrs.
Ditto	Northumberland-avenue.....	15 0		1 3 for 15 yrs.
Ditto	Leadenhall-street.....	15 3	2	1 0 for 15 yrs.
Ditto	Piccadilly.....	0 (3)		3 0 for 15 yrs. (3)
Ditto	Parliament-street.....	13 9		0 4 for 3 yrs.
Ditto	Oxford-street.....	16 0	2	1 0 for 13 yrs.
Mowlem & Co.	High-street, Kensington.....	14 0	3	
Ditto	Fulham-road.....	14 0		
Nowell & Robson	High-street, Notting-hill.....	12 6	3	
St. Marylebone Vestry	Oxford-street.....	8 4½ (1)		
Paddington Vestry (plain)	Fleet-street.....	10 7		
Chelsea Vestry (plain)	King's-road.....	10 6		
Ditto (ditto)	Sloane-street.....	10 6		
Ditto (ditto)	Fulham-road.....	10 3		
Various other kinds in Chelsea.....	King's-road.....	11s. 8d. to 14s. 2d.		

(1) On existing concrete foundations.

(2) On boards, since replaced.

(3) On the principle of deferred payments.

B.—COMPARATIVE WEAR OF WOOD PAVEMENTS AS REDUCED TO A TRAFFIC STANDARD.

System.	Situation.	Weight per yard width per day of sixteen hours.	Depth of annual wear of wood.	Comparative annual wear of wood as reduced to a traffic standard of 750 tons per yard width per diem.
Plain (pitch-pine).....	King's-road.....	468	Inch.	Inch.
Improved	Parliament-street.....	1,106	·055	·088
Improved (pitch-pine)...	King's-road.....	558	·164	·104
Henson's.....	Oxford-street (east).....	1,191	·089	·119
Fleet-street.....	Fleet-street.....	1,165	·191	·120
Henson's.....	Sloane-street.....	1,165	·269	·173
Improved	Sloane-street.....	279	·065	·175
Improved	Leadenhall-street.....	808	·200	·186
Plain.....	King's-road.....	603	·157	·185
Plain.....	King's-road.....	551	·144	·196
Henson's.....	Leadenhall-street.....	1,000	·284	·198
Creosoted blocks (lime joint).....	King's-road.....	407	·111	·204
Plain (asphalte bed).....	King's-road.....	498	·139	·209
Henson's.....	Brompton-road.....	584	·184	·236
Creosoted blocks (mastic joint).....	King's-road.....	434	·139	·240
Henson's.....	Oxford-street (west).....	985	·329	·250
Asphaltic.....	Fleet-street.....	1,360	·456	·251
Plain.....	Edgware-road.....	584	·188	·254
Henson's.....	Oxford-street (central).....	948	·323	·255
Improved	Ludgate-hill.....	1,236	·428	·259
Lloyd's.....	Regent-street.....	558	·214	·288
Plain.....	Oxford-street.....	1,164	·475	·306
Asphaltic.....	Oxford-street.....	1,137	·484	·319
Asphaltic.....	Regent street.....	558	·286	·384
Asphaltic.....	Brompton-road.....	648	·373	·431

the Chelsea works, where the timber applied was of fair quality, it was found necessary to separately sort out, reject, and mark about one block in twenty, the rejections being 96,000 out of a total delivery of nearly two millions; and there is little doubt that, owing to the

With respect to the different systems, it may be observed that as nearly all the wood-paving companies concerned are stated to have either failed or failed to carry out their contracts for maintenance, it is probable that the rates tendered by them for maintenance were, as a rule, far too low, and as Colonel Haywood

reported in 1874, that the mean total cost per annum of wood-paving for heavy traffic was 2s. 7½d. per square yard, and for lighter traffic 2s. 4½d. per square yard per annum, this result is not a matter for surprise. The annual wear of wood appears to vary from one-twelfth of an inch per annum per 750 tons of traffic per yard width per diem, for plain pitch-pine pavement, to a little over two-fifths of an inch for asphaltic. In perusing this portion of the work, we notice a considerable number of typographical errors of importance, such as 10 shillings, 12 shillings, and 17 shillings, &c., in place of 1s., 1s. 2d., and 1s. 7d. per square yard for maintenance.

Mr. Stayton entered into very careful calculations as to the actual cost of wood pavement in Chelsea to extend over periods of fifteen and twenty years, including first cost, repairs, renewals every seven years (which he estimates as a fair average life for wood pavement under a traffic of from 500 to 700 tons per yard width per diem), and interest on loans, but not including cost of cleansing and sanding (estimated at 5d. per square yard per annum), and he claimed that the total cost is represented by 1s. 9d. per square yard per annum. On these grounds he justified the economy of removing the macadam from King's-road and Sloane-street, where it had cost 1s. 11d. per square yard for repairs (not including cost of cleansing). In Westminster at the same time it had been as follows:—

	s. d.
Parliament-street	2 10
Whitehall	2 10½
Victoria street	2 6
Great George-street	1 8
Piccadilly	2 8½

All of which have (as we know) now been repaved with wood.

Mr. Stayton considered that it would be preferable to adopt 5 in. in place of 6 in. blocks, the smaller depth being sufficient, and more economical by 10s. per thousand than the larger, which would be equivalent to a reduction of 1½d. per sq. yard per annum. This depth appears to have been already adopted in several London streets, especially in Kensington, and with satisfactory results. He also considered the plain system of paving preferable to any other—i.e., blocks laid on the concrete in their natural state, with the fibres vertical, and with intervening spaces, ½ in. wide, filled in with cement grout (1 to 3), the joints being kept parallel by the addition to each block of three cast-iron studs driven into its side. He attached a good deal of importance to the expansion of wood, which generally occurred during the first twelve months or so after completion of the work, and this was provided for by leaving a space near the footways of from 1 in. to 3 in. in width, filling up the space temporarily with sand, subsequently completing with cement grout, and pointing in cement.

It was not to be expected that Mr. Stayton's paper would be otherwise than freely handled by the talented body of experts to whom it was submitted, and especially by those who were favourable to the use of asphalt, and those who preferred the blocks to be either creosoted or pickled, but we must refer the reader to the work itself, or to the Proceedings of the Institute of Civil Engineers, for further information on this head. But Mr. Stayton in his replies furnished a good deal of additional interesting matter, and some subsequent correspondence from other members of the Institution contained much that was valuable, but for which we are unable to afford space, further than to quote an observation made by Mr. W. H. Delano as follows:—"The standard traffic of 750 tons per yard width per diem seemed a misleading formula, for the wear and tear of a road did not depend so much upon the weight passing over it as upon the speed at which that weight travelled. There was also the important element of width of tire, the state of the atmosphere, the camber of the road, and the mode of traffic, cross, heavy, one side empty, the other loaded, &c. Take the new Paris three-horse omni-

C.—ANNUAL COST OF WOOD PAVEMENTS.

System of Wood pavement.	Situation.	Traffic weight per year width per diem in tons.	Annual cost per square yard for first cost, renewals, repairs, and interest on loans (exclusive of cleansing) if spread over a period of fifteen years.	Proportional relative cost, based on a reduction to an uniform traffic of 100,000 tons per year width per annum. (Deacon's scale.)
		Tons.	s. d.	s. d.
Asphaltic.....	Fleet-street .....	1,359	2 0	0 5
Plain .....	Oxford-street .....	1,164	1 10	0 5
Henson's .....	Oxford-street (E.) .....	1,791	1 10	0 5
Asphaltic .....	Strand .....	1,100	1 10	0 5
Henson's .....	Oxford-street (G.) .....	945	2 1	0 5
Henson's .....	Fleet-street .....	1,165	2 1	0 6
Improved .....	Oxford-street (W.) .....	985	1 10	0 6
Asphaltic .....	Parliament-street .....	1,106	2 1	0 6
Henson's .....	Euston-road .....	1,137	2 2	0 6
Improved .....	Oxford-street .....	700	1 5	0 6
Improved .....	Leadenhall-street .....	985	2 1	0 7
Improved .....	Ludgate-hill .....	808	1 9	0 7
Henson's .....	Leadenhall-street .....	1,236	2 9	0 9
Plain .....	King's-road .....	1,900	2 8	0 9
Plain (pitch-pine) .....	King's-road .....	551	1 8	0 9
Asphaltic .....	Edgware-road .....	468	1 6	0 10
Asphaltic .....	Brompton-road .....	554	1 10	0 10
Henson's .....	Regent-street .....	645	2 1	0 10
Improved .....	Brompton-road .....	558	2 0	0 11
Improved .....	Piccadilly .....	584	2 1	0 11
Improved .....	King's-road .....	800	3 0	1 0
Improved .....	King's-road .....	407	1 6	1 0
Improved .....	King's-road .....	498	1 10	1 0
Improved .....	Knightsbridge .....	790	3 0	1 0
Improved .....	Regent-street .....	558	2 2	1 0
Improved .....	King's-road .....	134	1 10	1 2
Improved .....	Sloane-street .....	279	1 3	1 3
Improved .....	King's-road .....	603	3 2	1 5
Improved .....	King's-road .....	558	3 2	1 6

buses, carrying, when full, forty-six people, including driver and conductor, weighing, when full,  $\frac{1}{2}$  tons, the width of the wheel treads being only  $3\frac{1}{2}$  in., running at a speed of seven to nine miles an hour, and compare the same weight on a  $4\frac{1}{2}$ -ft. wide smooth cast-iron roller dragged at one mile and a half an hour. The latter improved a road, whilst the former rapidly destroyed it."

Returning to the subject of cost of wood pavement, the contract for maintaining Piccadilly is 3s. per yard for a period of fifteen years, and that by the same Company (Improved) for Paris is 3s. 2d. per square yard per annum, which probably gives a not unreasonable profit to the contractors if they are held tight to the terms of their contracts. The work contains a reprint of a very complete article on the wood pavements of Paris, including the specification and terms of contract prepared by the *Département des Ponts et Chaussées*, and also specifications from Mr. Strachan and Mr. Livingston, the Surveyors of the Chelsea and the St. George's Vestries, the former for the proper supply of all the materials requisite for a wood pavement (including those for foundations), and the latter for the execution of similar work by contract. Reference is also made to the reports and papers on this subject of Mr. Park Neville, Mr. O. H. Howard, Mr. Deacon, and Mr. C. Dunscombe.

Dr. Love, who is the compiler of this work, has treated the subject of asphalt as extensively as he has treated that of wood, including amongst his contributors Colonel Haywood, Captain F. V. Greene (who, as Vice-President of an Asphalt Paving Company, should be slightly discounted when he institutes comparisons between asphalt and other kinds of paving), Mr. W. P. Rice, of Cleveland; Mr. E. P. North, Mr. E. Towle, Mr. Dunscombe, &c. He has also published some valuable specifications,—viz., those for Paris (including the Instructions of 1884) and those for New York and Buffalo. Working out the total cost per annum extended over a period of sixteen years, we gather from Mr. Dunscombe that in Liverpool,—

Asphalt 1 in. thick costs 6d. per sq. yard.	
" 1 $\frac{1}{2}$ " " 9d. "	
" 2 " " 1s. 1d. "	
" 2 $\frac{1}{2}$ " " 1s. 2d. "	

In London the pavements of asphalt have cost as follows:—

Val de Travers .....	1s.
Limmer .....	9d.
Société Française .....	11d.

but this appears to be for maintenance only, and not to include a proportion of first cost.

In some parts of America especial attention appears to have been directed to the preparation of bricks suitable for paving, and the crushing strengths of some of them compare very favourably with some of the less durable stones,—so much so that for light traffic they are in considerable favour in many towns; their advantages are said to be cheapness, smoothness, and cleanliness, freedom from noise and non-absorbence; their disadvantages are lack of uniformity in the material, and the liability of incorporating in the pavement bricks of a too soft and porous nature, which crumble the first winter under the action of frost. They are considered to be superior to macadam and wood, and, for a maximum traffic of 3 tons, also superior to granite.

Dr. Love has devoted a considerable space in his work to curbs (including a novel form of iron curb invented by M. Nicot, a French contractor), to footpaths,—treated by Mr. H. P. Boulnois, Borough Engineer of Portsmouth, and Mr. Strachan, of Chelsea,—and to tramways. He has also treated on that difficult subject,—namely, how to control the many different parties who for one cause or another are perpetually breaking up the streets. Cleansing, watering, and the removal of refuse are also dealt with, and interesting statistics given of the relative cost of these often-neglected items of expense on the different kinds of pavement.

Mr. Wheeler's article on roads, their repair and maintenance, which was especially written for the National Cyclists' Union, is here reproduced, and M. Waddington, lately French Ambassador to London, has contributed a few useful notes on the administration of the public roads in France. The versatile Captain F. V. Greene has also contributed a most admirable article on roads, including sections of an excellent form of tram-rail, which will not whip off your tyres or twist the spokes out of your naves. The editor has scanned the pages of *Engineering*, and got a good deal out of them about rollers and rolling,—a

matter on which so many persons differ. A treatise by Mr. C. Herschel, of Boston, is republished, in which the whole subject of roads is very clearly and almost exhaustively treated.

As we have before said, the editor rarely expresses any personal opinion about the matters which he has collected and compiled into a very valuable work. We do not say that it is presented to us in a very perfectly readable form, or that it might not be slightly readjusted with advantage; but there is very little of it that is not worth reading, and the editor has exercised great soundness of judgment in the selection of his materials.

## NOTES.

THE recent notice of the Bank of England in regard to the investment of dividends on Consols is of much general interest and importance, and is a very distinct step in advance and along the path of thrift. The Bank will, in future, invest the dividends as they become due on less than 1,000l. Consols. An order for the investment of dividends must in the first place be given to the Bank; from that time forth the dividends will be invested, the Bank charging a commission of one penny in the pound which will be deducted from the dividend. The dividend will not be invested until 15 months after it has become payable, so that if any holder of Consols wishes to make use of a particular dividend he can do so. That this easy method of saving money will much promote thrift we cannot doubt. An artisan, for example, may have his fifty pounds worth of Consols, which, after he has given due notice, will go on accumulating as a provision for old age. The limitation of the amount to 1,000l. is specially intended to make the new arrangement beneficial to small investors, and we sincerely hope that in a long time it will be the endeavour of every man in a small way of business to have his holding of Consols gradually accumulating and increasing.

A CORRESPONDENCE has for some time past been carried on in the *Times* on the subject of the relative merits of trial by jury and trial by a judge without a jury. We have more than once pointed out that in nearly every case arising out of building disputes, trial by a judge, assisted by a skilled assessor, is the most satisfactory. Of course, when a case involves the examination of accounts, or of many details, as is the case when a building brings a claim for extras, the reasonableness of which is disputed by the building owner, the only satisfactory tribunal is an arbitrator. But both in these cases, and in every other which arises in connexion with buildings, such as whether commission is payable on the sale of an estate, the main thing which parties desire is that the case shall be heard with as little delay as possible, without waste of money in preliminary proceedings. It is interlocutory proceedings which are the bane of our litigation. In nine cases out of ten they have no effect on the ultimate issue. One special value of the Arbitration Act of 1889, was that persons can now enter into a binding submission to arbitration without invoking the aid of the Law Courts by applying to have the submission made a "rule of Court." But in every dispute, if the parties really know what is the actual bone of contention, it should be possible to come to an issue without pleadings and all the legal skirmishing which now often occurs.

PUBLIC attention has this year been noticeably called to the many street accidents which occur in London from time to time. It is obvious that measures should no longer be delayed to facilitate the passage of foot-passengers across the most crowded thoroughfares of the Metropolis. The stoppage of the vehicular traffic even two or three minutes in order to allow foot-passengers to cross is one of the most



serious causes of the derangement of the wheeled traffic, without taking into account the dangers run by pedestrians. The remedy for this state of things is plain and easy. At certain points along the most frequented thoroughfares subways or bridges should be built. These would not only relieve the traffic at these particular points, but at other places, for many foot-passengers would make their way to these points who at the present time cross in any place where they happen to be. There is a subway at Westminster under Bridge-street for the use of Members of the Legislature. This shows that the same work could be constructed in other parts of London. But in many places probably bridges across the street would be best. They might often be constructed so as to be ornaments to the streets. They could be made of light, well-worked, and well-designed ironwork, or of stone. For example, as regards the placing of these bridges, one is much wanted near the Law Courts; more than one is required in the City near the Mansion House. A subway or a bridge should be constructed in Piccadilly, near St. James-street. But the point we are now insisting on is not the actual places for these works, but the absolute need for their existence. In some places they might even be made to pay for themselves, as recesses might be constructed which would be rented for newspaper or flower stalls.

IT is interesting to note, as a sign of the times, that questions relating to the necessity for the removal of insanitary property are not opposed now as they were formerly. The Salford Town Council have just passed a resolution to the effect that it would be well to proceed at once with a comprehensive scheme for dealing with the insanitary dwellings of the borough. At the meeting of the Council, when this resolution was passed, it was stated that there were two classes of property proposed to be dealt with: that which was absolutely unfit for habitation, and that which was fit for habitation, but which it was desirable to remove for purposes of re-arrangement of sites, &c. As to the first class of buildings, steps were being taken to remove them; but the second class could only be dealt with under a scheme. In most schemes for the removal of insanitary buildings it is frequently necessary to remove dwellings perfectly fit for habitation, and no one, we think, can object to this if the improvements which result from such removals, by the re-arrangements of sites, are desirable, and add to the importance of the locality. At the meeting of the Salford Town Council there seemed to be a unanimous agreement as to the necessity of the proposed improvement, and it was stated that the Health Committee would bring before the Council a comprehensive scheme for the demolition of the particular block which had been referred to, and would ask the Council to provide the necessary funds.

IN reference to the much-spoken-of German National Monument Question (see *Builder*, pp. 372, 444, *ante*), designs have been invited from a limited number of artists, whose names have not been officially mentioned, among whom, however, we are able to name Messrs. Rettig and Pfann and Bruno Schmitz, the first and second prize-winners of the last great competition. The invitations to compete, which have been distributed by special command and under direct supervision of the Emperor, promise each competitor 4,000 marks for his trouble, in consideration of which sum the design becomes the property of the Imperial Government, and they also promise that designs of special merit will receive premiums up to a value of 12,000 marks (some 600*l.*). Not a word is stated as to who will award the premiums. The "programme" for the required designs includes little besides a notification that the proposed extension of the "Schlossfreiheit" is to be the site for the monument, and that the latter is to be in the form of an equestrian statue (in accordance with the Reichstag decision of last session), a few

measurements, and a request not to omit the architectural "laying out" of the neighbouring ground. The designs, which are to be sent in by next April, and will then be publicly exhibited in Berlin, are to be partly in model form and partly in geometrical drawings.

IN the list of German cities most visited by Englishmen, Dresden certainly takes a prominent position, but the city has for many a long year been relying on former laurels, and it is only within the last ten years that the catalogue numbers of the collections have shown a perceptible increase. A revival in architectural activity is also now perceptible: municipality, government, and royal household having given their architects and engineers plenty of commissions, and private companies and persons having followed this example; so that, if the general management prove a good one, Dresden, some ten years hence, will certainly be able to find a place in a list of the better class of recently-improved towns of the Empire; at the same time having the advantage of being able to show street fronts of a good freestone, the use of this material, within easy reach of the builder, being usual. Among the new buildings, we may mention the now nearly-completed "Albertinum" (sculpture museum and State record office) and the gigantic block, in course of erection, destined to contain the offices, schools, and exhibition halls of the Saxon "Academy," both of which have found room on the far-famed "Brühlsche Terrasse," on the left side of the river; and we must not forget the huge "Ministry of Finance," the foundations of which can be seen on the opposite side of the water. Among the larger schemes which are still on paper we hear of a new central railway station, a much-needed new post office building, and a large block for the municipal offices; whilst among those already worked out and about to be taken in hand next spring we may count the proposed fourth Elbe Bridge and the extensive embankment thoroughfare which is to be laid out on the right hand bank of the river and will form a practical connection between the four large bridges; also the two large covered markets over which so much time has already been spent at the city "Board of Works." The street fronts in the town proper are undergoing a rapid change, new hotels, shops, and office buildings finding their way into the narrowest of streets, and more especially in the newly-opened-up thoroughfares which have been cut through the slums some years ago.

THE sanitary condition of Barnstaple (North Devon) is the subject of a report by Dr. Barry to the Local Government Board, dated July 21. Fatal cases of diphtheria have occurred there, the spread of which appears to have been assisted by want of isolation, but the report as to the sanitary circumstances of the district discloses the usual kind of conditions which precede cases of diphtheria and typhoid. House refuse is generally stored in uncovered ashpits, which are emptied "at long intervals" by the occupiers and the contents used on the land. Excrement disposal is usually by pit privies, "many of which remain unemptied for long periods." In no place is there any public scavenging; the inhabitants being apparently left to clean out their filth receptacles in accordance with their own perceptions or their own indolence. "At Braunton the houses at the lower portion of the village have wells which are liable to pollution; these are sunk only 15 ft. to 20 ft. in the gravel, and as the old square drain used as a sewer is laid in this gravel, fouling of such wells or of some of them must necessarily occur." Dr. Barry reports that the inspectors make regular inspections, and appear to have a good knowledge of the deficiencies of their district, but that by-laws as to dealing with unemptied privies and other receptacles are not sufficiently enforced. Under date July 31 Dr. Barry also reports on the sanitary condition of Easingwold rural sanitary district. Here we have a repetition

of the same conditions: rubble drains; wells sunk in contiguity to middens and leaking drains; middens frequently of large size, "and as the scavenging is left to the occupiers, accumulations of filth are frequent." This is recurring to several times in the report: "excrement disposed of in uncovered middens which at the time of my visit contained enormous accumulations of filth and ashes," and similar remarks are made about various houses or groups of houses in the district. The key to all this is in the sentence "As the Sanitary Authority do not undertake the removal of refuse the inhabitants have either to undertake this work themselves or to arrange with farmers or others to do it at their convenience; a mode of procedure which invariably leads to the storage of large accumulations of filth." It is the same story here as in other rural districts; ignorant persons must have sanitation forced upon them by authority, or they will never have it at all. To leave accumulations of dirt saves trouble, and that is a sufficient defence of it to the uneducated mind. In this report again it is stated that the Medical Officer of Health, Mr. E. Buller Hicks, has a thorough knowledge of his district, and has brought its shortcomings frequently to the notice of the Sanitary Authority, but "much of his advice has been unheeded, or has been attended to in a makeshift manner only." If the Sanitary Authorities are so indolent and careless of their duty, how can we wonder that the people are no better?

IN reference to the class of reports quoted from in the preceding paragraph, we may add that it would be well if the Local Government Board would turn its attention to the sanitary condition of some of the villages on the East Coast which are now becoming largely frequented as watering-places. The town of Cromer appears now to be on the way to a good sanitary condition, though there is much to be done there yet; but the village of Overstrand, two miles off, which is now rapidly rising to the dignity of a watering-place, is in the most primitive state in regard to sanitation. Four years ago (when we gave some sketches from the district in the *Builder*) Overstrand was but a fishing village. Several terraces of "marine villas" have now sprung up, besides two or three detached houses of a better class, and there is talk of a new street and a large hotel. In that case the main attraction of the place, as a quiet seaside resort, will be gone; but that is all the more reason why the drainage should be looked after. What drainage there is appears to be taken to a couple of big cesspools, how often emptied we know not; a grating over one of them is close to the main gangway to the beach, and after heavy rain smells abominably, and as the ground is of a very permeable character, it is not surprising that leakage should have taken place, and that a rivulet of pure sewage should have been seen occasionally down the face of the cliff. A Sanitary Inspector at Overstrand would find some of the same incidents mentioned by Dr. Barry in his above-named reports; middens which the owners are left to empty at their own will, and which are therefore never emptied till dire necessity compels it (a remonstrance from visitors generally producing some indignation), and pumps from which water for all purposes is drawn, standing over wells in happy proximity to the middens aforesaid. Two or three cases of diphtheria are known to have occurred not long since, though the inhabitants have become discreetly reticent on this subject. Under what Rural Sanitary Authority is Overstrand? A very sleepy one, apparently, if any. Lower Sheringham, on the other side of Cromer, has already its big hotel, apart from the village; the latter we only know by a cursory visit, but if the smells of Lower Sheringham are any indication of its sanitary condition, it must want the doctor badly. While speaking of this neighbourhood, we cannot but express the greatest regret also at seeing the beautiful down between Cromer



and Overstrand, known as the "lighthouse hills," offered as building land for residences. This is one of the most beautiful heights on the English coast, and its proximity forms one of the many attractions of Cromer and Overstrand; to build on it would be to deprive Cromer of the best of the very attractions which draw people there, and would therefore probably in the end prove a very doubtful benefit even to the landowner.

TO serve for a public-house by sign of the "Sir Paul Pindar" has been the latter-day fate of one of our best relics of a London merchant-prince's residence nearly 300 years ago. From a brief letter addressed to the *Standard* last week we learn that what yet remains of Sir Paul Pindar's home in Bishopsgate-street-without will, in all likelihood, very soon be "wrecked," having been acquired, together with some adjoining property, by the Great Eastern Railway for the extension of their Liverpool-street terminus. We understand that the demolition will ultimately extend to all the property between the ends of Worship-street, in Norton Folgate, and Liverpool-street. It is stated that Pindar—a contemporary, in his boyhood, of Gresham, and son of Thomas Pindar, or Pinder, of Wellingborough—built this house upon his return from Italy at the end of Elizabeth's reign\*; and he is said to have been visited here by her two successors on the throne when they wanted to borrow of his ample gains. At the Turkey Company's instance, James I. despatched Pindar, in 1611, to, as the epitaph says, "the Turkish Emperor." He returned, greatly enriched, after nine years' absence. Having benefited his Royal masters to his own serious embarrassment, Pindar died in 1650, aged eighty-four years. He was enthusiastic for architecture, and contributed 10,000*l.* towards the screen and south transept for Inigo Jones's work at old St. Paul's. Pindar's house and its park-ledge in Half-Moon-street have been frequently illustrated. Their later aspect may be seen in several views at the Guildhall Library, where also is a copy of Schnebbelie's plan of the old London Workhouse, the house, lodge, &c. We may also refer our readers to J. T. Smith's "Ancient Topography of London" (1812), and Wilkinson's "Londina Illustrata." Smith gives a drawing (made in 1792) of the interior of a first-floor room, showing the ornamentation of its ceiling, panels, wainscot, and chimney-piece,—decorations which, as he tells us, were cut away in 1811 in order to render the room "a little comfortable." The Pindar coat-arms were found beneath a sheet of metal fastened on to the ceiling. Reduced from its pristine proportions, deprived of its large garden planted with mulberry-trees, mutilated and defaced without and within, this old house still retains portions of its exterior towards the main road. A solitary gable rises above the first and second floors, of which latter the windows project oriel-wise far beyond the ground story. The whole front forms a specimen of domestic work, in wood, richly carved, so singular of its kind, that we trust some steps will be taken to save it from destruction. A magnificent ceiling was removed to the South Kensington Museum from the house next door (southwards), which some consider to have been part of Pindar's house, and since pulled down. The Reverend Thomas Hugo contributed a paper to the London and Middlesex Society (printed in their Transactions, 1857), descriptive of this house, and of some plaster ceilings in various tenements at the rear, highly decorated with figures, wreaths, shields, ribbands, and the like. A clearance has lately been made on the site of these houses for purposes of the railway.

THE death of Miss North should not be allowed to pass without brief notice. She possessed in a remarkable degree the power of portraying flowers. This kind of still-life art

\* Yet his epitaph at St. Botolph's-without describes him as "an inhabitant twenty-six years, and bountiful benefactor to this parish." Many particulars of his career are set out in the MS. of the funeral sermon preached by Nehemiah Rogers.

is one which is, generally speaking, too purely imitative to be ranked very high. For decorative purposes it is of value, but in our opinion to hang portraits of flowers round a room is nearly as bad as placing artificial flowers on a table. But Miss North used her special gift not only for the advancement of knowledge, but as a means of enabling the people of this country to become acquainted with the appearance of the flora of nearly every country under the sun. Miss North's collection of the portraits of flowers at Kew will be a perpetual monument to her indefatigable zeal in portraying the flowers of the world, and will be a continual source of interest, pleasure, and recreation to thousands. It would be useless to enumerate the countries in which Miss North had travelled. In 1870 she visited Canada, the United States, and Jamaica, and her last journey a few years ago was to South America. Since that time her health has been gradually failing, and she has lived in complete retirement at her house in Gloucestershire, ever interested in her garden, which was a treasure-place of rare and beautiful plants collected in all parts of the world.

THE silly knot of persons at St. Albans who thought it worth their while to propose a testimonial or monument to Lord Grimthorpe for amusing himself by disfiguring their Abbey, have got the snub they might have expected from their genial idol. Lord Grimthorpe's letter to a local journal on the subject discloses a new phase of his self-appreciation, however. A little while ago we suggested that the motto over Wren, "Si monumentum requiris, circumspecte," would be an ingenious sarcasm to erect over against St. Albans. Lord Grimthorpe, however, we find, actually adopts Wren's epitaph as the one most appropriate to himself, only pointing out that Wren "did not pay for the building." It appears therefore that Lord Grimthorpe seriously imagines that his work at St. Albans has set him on a level with the designer of St. Paul's! Such vanity would be a spectacle for amusement if unfortunately the results of it were not so permanent. That it "will be there for many centuries" is probably true, for it is solid building enough; but it will be there for the laughter and not for the admiration of posterity.

#### LETTER FROM PARIS.\*

THE distribution of medals and diplomas in connexion with the Great Exhibition is to commence immediately, and to be carried on continuously in the order of the classes and groups. It has been delayed partly for the engraving of the diploma form, which has occupied no less than seven months. It is expected that the condemned buildings on the Champ de Mars will be removed by the end of the month, and the treatment of the buildings to be preserved will then be taken in hand. MM. Bouvard and Formigé will in the first instance replace all the essentially temporary work on their respective buildings by solid materials, before the special use of these buildings is actually entered on. It is said to be pretty well settled now that the Palais des Beaux-Arts will become the permanent abode of the long-talked-of Musée des Arts Décoratifs. As we have before mentioned, it was formerly intended that this Museum should be built on the site occupied by the ruins of the Cour des Comptes. What will become of the latter if the Government ratify this new idea is then the question; and probably there will be no course but to remove and sell the ruins of the Cour des Comptes as old materials, and leave the site free for other purposes. Every one in Paris will be very glad to see the last of them, the remains being both unsightly in themselves and having disagreeable memories connected with them.

There is talk also of transferring the offices of the Minister of Finance, which since 1870 have occupied a part of the Louvre, to the site in the Boulevard St. Germain now occupied by the War Department, the latter being transferred to the Hôtel des Invalides, too large now for its remnant of pensioners, and where the headquarters of the Military Staff are already es-

\* Unavoidably postponed from last week.

tablished. By this arrangement, the Louvre buildings will be left entirely free for artistic objects. All the *personnel* of the museum could be installed in the Pavillon Flore and the Pavillon Marsan, and the State would possess the whole immense palace for its collections. If these projects are not immediately realised, the arrangement for them seems to show that the Direction des Bâtimens Civils is awaking a little out of its proverbial torpor.

In the Louvre itself further alterations have been going on, and the Salle Rude, closed for some time past, is now re-opened and enriched with some of the splendid bronzes of Barye, and also some of the various works of Carpeaux, including the well-known group of "the Dance." The Salle des Sept Cheminées has totally changed its aspect. In that room are now exhibited the "Sacre" of David and the "18th Brumaire" of Bouchot; while in the Salle de Beauvais the ceiling has been "marouflé" with the immense decorative painting by Carolus Duran, "Gloria Marie Medicis," which, since its appearance at the Salon of 1878, has been the subject of violent polemical criticism. This canvas, originally intended for the Luxembourg, has been placed in a framework designed in the style of "La Sibyle," with escutcheons with the arms of France and of the Medicis. Lastly, we have to mention at the Louvre the legacy of sketches by Carpeaux left by the late Philippe Burty, and the re-exhibition of a number of splendid miniatures of the fifteenth and sixteenth centuries which have been for years hidden in the store-rooms of the Louvre for want of space to show them.

The repairs at the Pont Neuf have uncovered the ancient piling, about which there is some interest. These piles, which date from the year 1602 at least, the time when the bridge works were being most actively carried on,—or perhaps from 1578, the year when Henri III. laid the first stone,—are in a state of perfect preservation. A little smaller than the piles in use to-day, they are mostly square in form, and in those days were driven by immense mallets worked by hand. The foundation-stones appear in a sound condition; they terminate in steps to which the piles serve as base, and which were probably formerly above water, the level of the Seine having been lower then than since the water has been confined between quays. In spite, however, of this surprising state of preservation of the foundations, there has been a perceptible settling in the bridge, which has called for immediate attention.

Another structure, not quite so old, but venerable for a railway structure, the Gare des Sceaux, has been giving the same kind of trouble, cracks having been heard and crevices seen in its walls. It has been necessary to shore it up at once. The excavations which have been made for the purpose of repairing the walls have revealed the fact that a part of the station is built over some old quarries, and a considerable amount of underpinning has been necessary to render the buildings secure for the limited time for which they are required, until the completion of the new terminus on the Place Medis.

In the Garden of the Luxembourg a bronze-bust of Delacroix has just been placed, a fine work by Dalou, who has also executed the allegorical group for the pedestal, representing "Le Temps portant la Renommée." The principal face of the monument will bear the simple inscription—

À EUGÈNE DELACROIX  
SES ADMIRATEURS.

The work will probably be inaugurated towards the end of September. In connexion with this subject we may mention that the Commission des Musées Nationaux has selected the following works to be added to the Luxembourg collection: in sculpture, "La Sirène" by M. Puech, and the "Gilliat" of M. Carlier; in painting, "Les Bûches" by M. Quignon, "Le Réve" by M. Richemont, "La Vache Blanche," by M. Julien Dupré, "La Forêt d'Arques," by M. Gosselin, a still-life painting by M. Desgoiffe, an "Etude de femme" by M. Carolus Duran, and a "Haute de Cavaliers" by M. John Lewis Brown.

On the right bank of the Seine the buildings of the new Sorbonne are being carried on without interruption, and on the left bank the exterior of M. Bonvard's new Bourse is nearly finished. Of the design of this building we have before spoken. Not far from it the works connected with the Belleville rope railway are nearly completed. This new means of getting to the summit of the Twentieth Arrondissement will probably be completed and opened for



traffic in October. A still more important class of new works, perhaps, will be the substantial school buildings which the Municipality is shortly about to erect on the sites where wretched wooden barracks have been run up as schools, provisionally, since the time when, eight years ago, Parliament made gratuitous primary instruction obligatory. About eight to ten million francs will be spent on these permanent schools.

Two years ago, on the occasion of the annual congress of architects, we gave a description of the Russian church in Rue Daru, which up to the present time has been the only church in Paris dedicated to the orthodox rite of the Greek Church; but it is announced that another church for this worship is to be erected shortly in the Rue Bizet, near the Arc de Triomphe, in the centre of the favourite residential quarter of the Hellenic colony in Paris. It is a Greek resident, M. Demetrios Tzani Schilizzi, who has given the sum of two million francs for the work, which is to be in Byzantine style and surmounted by three cupolas.

The Railway Company "de l'Est" has just commenced some important works for the enlargement of the Gare de Strasbourg, which for a long time back has been quite insufficient for the traffic.

M. Poilpot's new panorama of "Les Engagements Volontaires de 1792," in the Bastille neighbourhood, has only been opened to the public for a few weeks before it has been destroyed by fire. Without having, of course, the high artistic qualities of the panorama of the Battle of Rezonville, by two such masters as Detaille and de Neuville, the work of M. Poilpot offered nevertheless a very interesting spectacle, especially as a picturesque restoration of a corner of old Paris. The spectator, supposed to be standing on the Pont Neuf, witnessed a scene full of life, framed amid the remarkable buildings contiguous to the two arms of the river, and looked across the quarter of the Arsenal to the wooded height of Chaillot, where the Trocadéro now stands. M. Poilpot, thanks to his assiduous researches, had revived a great deal of the ancient aspect of Paris, and among archaeologists the merit of his work in this respect was admitted.

The Académie des Beaux-Arts held a sitting recently to award the grand prix de Rome in architecture. The first prize has been awarded to M. Pontremoli, a native of Nice, and a pupil of MM. André and Lalou. The "deuxième premier" was awarded to M. Sortais, pupil of MM. Daumet and Guadet, who in 1888 obtained the "premier second grand prix," which this year has been carried off by M. Louis Varcollier, pupil of his father and of M. Gignain. M. Bossi, pupil of M. Pascal, obtained the "deuxième second." The subject of the competition was "Un Monument à Jeanne d'Arc," and the instructions indicated the site of a hill above the Seine, and in the neighbourhood of Rouen, as the supposed site. The competitors had reason to be grateful for this instruction as to site, which lent itself to such effects as successive terraces and porticoes, or an immense staircase leading up to a shrine before which was an equestrian statue of the heroine. The works exhibited, though very interesting, did not however strike us so much from the point of view of idea as of execution.

The Jury of the École des Beaux-Arts has given judgment on the competition for the first class of architectural students, the subject being "Un Théâtre de Grand Opéra." Second medals were awarded to M. Guilbert, pupil of MM. André and Lalou, to M. Cargill, pupil of MM. Daumet and Girault, and to M. Duquesne, pupil of M. Pascal.

There is an intention of modifying the regulations of the École des Beaux-Arts, so that in future (if the Minister confirms the decision of the superior Council of the École) the ateliers, of which the direction is confided to certain artists named by the Government, will be freely open to young students without a preliminary competition. Besides this, the subjects of anatomy, modelling, architecture, and history will not be so important as that of design, and the pupils only to assist in the classification of the works. One effect of this will be that we shall not again see, as has been the case, a pupil who has taken a high position for design being refused his position for not having given the correct date of the First Crusade. A man may certainly be an able sculptor, painter, or architect, without being strong in history.

We may mention lastly that a school of design for girls has been formed in connexion

with the School of Decorative Art which is to be installed, it is expected, in the old buildings of the Hôtel Dieu. M. Dutert, the architect of the Palais des Machines, has been appointed joint inspector of the school of design.

We have to record the death of M. Georges Contan, a decorative designer and the husband of Mme. Laure Martin Contan, herself a talented sculptor; and also that of M. Emile Levy, who died suddenly when just about to commence the decoration of the Salle des Caryatides in the Hôtel de Ville, in the first instance assigned to Cabanel. Levy was sixty-four years of age, and was a pupil of Abel Pujol, and Picot. He obtained the Prix de Rome in 1854, and received medals in the Salons of 1859, 1864, 1866, and 1867; he received in the latter year the Cross of the Legion of Honour, and a medal of the first class in the Universal Exhibition of 1878. Among his principal works may be named "Ruth and Naomi," the great work entitled "Musique Sacrée et Musique Profane," "La Dausse," and "La Prière aux Champs." He had recently been commissioned to decorate the Mairie of the Sixteenth Arrondissement. He was an artist of talent, a pastellist of the first rank, and excelled especially in female portraits and in allegorical compositions of a somewhat archaic style.

#### HAMBURG CONGRESS OF ARCHITECTS AND ENGINEERS.

THE Amalgamated Societies of German Architects and Engineers held their ninth congress at Hamburg during the last days of August. Of the German societies, the greater number of the larger ones (some thirty with 6,000 members) form or rather belong to the national amalgamated "Society of German Architects and Civil Engineers," and it is this powerful body that, besides having its annual meeting of deputies, has its biennial gathering (held each time at a different town), at which instructive sight-seeing, accompanied by good lunches and dinners, meeting of old friends, not without boisterous merriment, are the order of the day, and at which conventional speeches, lectures, and debates, whatever be their intrinsic value, only come into secondary consideration. The number of members present at such a biennial gathering greatly depends on the advantages which the elected town promises its visitors. If the town, besides having ordinary or special advantages for sight-seeing, neighbourhood, &c., happens to be known as a rich and hospitable one, and if there happens to be an energetic architectural society on the spot to take the management of the reception in hand, there is sure to be a good contingent of members present; and if the town at the same time be a popular one, and have some special patriotic feature for the "Fatherland" lovers within easy reach, the attraction will be greater still, and the numbers will probably exceed the usual average.

So it has proved at Hamburg, where, instead of the 700 expected guests, 1,300 appeared, and although this number is very small in comparison with the number of architects in the Empire, and although the most esteemed of the profession were, for the most part, absent, and the field was nearly entirely in the hands of those who excelled more in wit or popularity than in their work, the show was certainly a stately one, and the gathering as a whole a great success.

It would take too much space to follow up the doings at the Congress day by day; yet it may be well to state that our friends over the sea ought to think themselves lucky to have a possibility of being received as they have been at Hamburg, by the authorities, the companies, and private persons. From the official opening day on the 24th, to the close on the 28th, the time was so instructively and enjoyably filled up as is seldom the case, and it was not till the Hanse city had been left, and the excursions to Lübeck, Kiel, and the North Sea-Baltic Canal had been successfully completed, that the visitors had any time for the much-needed rest after such a week of hard sight-seeing and late hour festivities. We may mention that every portion of the town and its surroundings was visited, mostly in groups under able and practical guidance, that all Government and municipal buildings or works were open to inspection, and that the proprietors of the numerous picturesque, well-planned, and luxurious villas had thrown open their homes, partly for inspection, partly for hospi-

talities. Inspections were done on a large scale, half a dozen steamers being employed on the harbour and Elbe, and quite a flotilla of boats and tugs on the Alster, and when it came to the grand patriotic part, i.e., the visit to the newly-acquired Heligoland, two first class American passenger steamers (the *Columbia* and the *Moravia*) were lent by the Hamburger Packetfahrt-Gesellschaft, the managers of which entertained the whole of the company to a sumptuous dinner on board. The town gave a banquet; at Blankenese a dinner was given; on the Alster lakes an "Italian night" with fireworks was arranged, and on the Elbe, outside the town, the rows of villas celebrated the passing of the guests with a general illumination and successive fusillades of rockets, forming effects not easily forgotten by those present. In fact, in and outside the city, authorities and civilians all vied in their attempts to do their best for the visitors.

As observed, at these gatherings the lectures, with their debates, come into secondary consideration. The early hour at which the lectures were started caused the splendid hall in which they were held to have (excepting on the opening day) a more empty appearance than necessary—a fact, however, by no means surprising to those who know what an evening festivity among old German friends means. The lectures, which, as a rule, were well received, mostly took the form of papers read by their authors before publication, and they are now to be found printed full length in our foreign contemporaries and in the Hamburg local press. The discussions that sometimes followed were of a very poor kind, so that, interesting as the topic might be, there was throughout a certain feeling perceptible that the "work" was but a farce, and that the sooner it was done with the better.

As the papers in themselves were of value, it will only be right to mention them, especially as the amount of labour each of them contains ought not to be undervalued. The most popular lecture, we believe, was the one read by the president of the Hamburg Society, Herr Andreas Meyer, on the first day, under the title of "Hamburg and its Buildings," and it was, certainly, thanks to this concise description of the town that the visitors got a clear idea of what was to be seen, without having waded through the large volume bearing the same title, which has been published for the occasion and contains very minute details. A paper read by Professor Hubert Stier (Hanover), before a very good audience of architects was exceedingly well received. In accordance with the heading, "Results of German Architectural Competitions during the last Twenty-two Years," the Professor gave, besides general comments, some very interesting statistics about the 258 competitions opened in the Empire since 1868. To Baurath Hobrecht (Berlin) fell the highly-interesting theme, "Street Building in Cities, with Special regard to their Future Requirements of Underground Connexion," and in this paper comparisons with London arrangements played an important part. Under the title, "Contemplations on Style," the editor of a Berlin contemporary, Herr Fritsch, read a somewhat lengthy but able paper, in which he made comparisons with the styles of former times, referred to the expected future development, and the means that should be employed to keep this development on a natural basis. For the civil engineers an excellent paper on "Wide-span River and Valley Bridges" was read, and the day before the trip to Heligoland a very suitable lecture was given on "Modern Steamships and their Machinery." In all cases the lecturers had taken special care to prepare their subjects, and it may be expected that the amount of material collected will be turned to some good account, either as a basis for future discussions in the different societies, or as preparatory essays for books about to be published.

In 1892 the gathering will be held at Leipzig, but we are afraid that this town has been ill-chosen, the contrast between the two being too great.

OPENING OF A NEW BRIDGE IN BELFAST.—The new Albert Bridge, built by the Belfast Corporation at a cost of 36,000*l.*, across the river Lagan, the foundation-stone of which the Duke of Clarence and Avondale laid about a year ago, and which is intended to take the place of the old stone structure which collapsed four years ago, was opened by the Mayor of Belfast on the 6th inst.



### THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

ALTHOUGH this year's meeting of the British Association (which has been held in Leeds for a second time, after an interval of thirty-two years) has not been so largely attended as last year's meeting, it seems to have produced a fair number of interesting papers in the various sections.

The President, Sir Frederick Abel, in his opening address, dealt mainly with two subjects,—Applied Electricity, and Explosives. We give a few condensed extracts from it:—

#### Electric Lighting.

While the prediction made by Siemens, eight years ago, that electric lighting must take its place with us as a public illuminant, has already in a measure been fulfilled, important progress is being continuously made in developing and perfecting the arrangements for the generation of the supply, its efficient distribution from centres, and its delivery to the consumer in a form in which it can be safely and conveniently dealt with and applied at an outlay which, even now, does not preclude a considerable section of the public from enjoying the decided advantages presented by electric lighting over illumination by coal-gas. Yet our recent progress in this direction, encouraging though it has been, is insignificant, as compared with the strides made in the application of electric lighting in the United States, as may be gauged by the fact that while in America the number of arc lamps in use in April of this year was 235,000, and of glow-lamps about three millions, there are at present only about one-tenth the number of the latter, and one-hundredth the number of arc lamps, in operation in England. In some important directions we may, however, lay claim to rank foremost in the application of the electric light; thus our large passenger ships and our warships are provided with efficient electrical illumination; to the active operations of our navy the electric light has become an indispensable adjunct; and our system of coast defence by artillery and submarine mines is equally dependent for its thorough efficiency upon the applications of electricity in connexion with range-finding, with the arrangement and explosion of mines, and with the important auxiliary in attack and defence, the electric light. Other important applications of the electric light, such as its use as a lighthouse illuminant, for the lighting of main roads in coal mines, and even for signalling purposes in mid-air, through the agency of captive balloons, are continually affording fresh demonstrations of the value of this particular branch of applied electric science.

#### Power Electrically Transmitted.

The Paris Electric Exhibition afforded interesting illustrations of the performance of a variety of work by power electrically transmitted, including a short line of railway constructed by the firm of Siemens, which was a further development of the successful result already attained in Berlin by Werner Siemens in the same direction, and was, in its turn, surpassed by the considerably longer line worked by Messrs. Siemens at the Vienna Exhibition. Various short lines which have since then been established by the firm of Siemens are well known, and one of the latest public acts in the valuable life of Siemens was to assist at the opening of the electric tramway at Portrush, and where the idea, so firmly rooted in his mind from the date of his visit to the Falls of Niagara, in 1876, of utilising water-power for electrical transmission,—a result first achieved on a small scale by Lord Armstrong,—was more practically realised than had yet been the case. Since that time Ireland has witnessed a further application of electricity to traction purposes, and of water-power to the provision of the required energy, in the working of the Bessbrook and Newry Tramway; while London at length possesses an electric railway, three miles long, to be very shortly opened, which will connect the City with one of the southern suburbs through a tram-subway, and, although including many sharp curves and steep gradients, will be capable of conveying one hundred passengers at a time, at speeds varying from thirteen to twenty-four miles per hour. During the past year a regular service of tramcars has been successfully worked, through the agency of secondary batteries, upon part of the large tramways of North London, with results which bid fair to

lead to an extensive development of this system of working. The application of electricity to traction purposes has, however, received far more important development in the United States; at the commencement of this year there were in operation in different States two hundred electrical tramroads, having a collective length of 1,641 miles, with 2,346 motor-cars travelling thereon. Further extensions are being rapidly made; thus, one company alone has thirty-nine additional roads, of a collective length of 385 miles, under construction.

#### Electric Welding.

The successful practical realisation of Joule's predictions in regard to the application of electric currents to the welding of iron and steel, and to analogous operations, through the agency of the efficient machines devised by Professor Elihu Thomson, was demonstrated to the members of the Association by Professor Ayrton at Bath two years ago, and was shown upon a larger scale to visitors at the Paris Exhibition last year, and recently to highly interested audiences in London by the late President, Sir Frederick Bramwell. At the Crewe Works, Mr. Webb is successfully applying one of these machines to a variety of welding work. With such practical advantages as these, electric welding bids fair to receive many useful applications. Another very simple system of electric welding, especially applicable to thin iron and steel sheets, hoops, &c., has been contemporaneously elaborated in Russia by Dr. Bernados, and is already being extensively used. The required heat at the surfaces to be welded is developed by connecting the metal with the negative pole of the dynamo-machine, or of a battery of accumulators, the circuit being completed by applying a carbon electrode to the parts to be heated. This mode of operation appears to have been practised upon a small scale, some years ago, by Sir William Siemens, to whom we may also owe the first attempt to practically apply electric energy to the smelting of metals.

#### Science applied to Mining.

Reference was made to the production of new explosive agents for mining and quarrying purposes, to the improvements of safety-lamps, and to the provision of serviceable, safe, and portable electric lamps for use in mines. The recent legislation in connexion with mines is (said the President) certainly deficient in any sufficiently decisive measure for excluding from mine-workings certain forms of lamps which, while fairly safe in the old days of sluggish ventilation, are unsafe in the rapid air-currents now frequently met with in mines. It is, however, very satisfactory to know that the strong representations on this subject made by the late Commission, combined with force of example, and with the conclusive demonstration of the superiority of other lamps, have led within the last two years to the very general abandonment of the unprotected lamps in favour, either of simple, safe, modifications of these, or of other safe and efficient lamps. In one important respect recent improved legislation has failed to effect a most desirable change,—namely, in the substitution of safety-lamps for naked lights in workings where small local accumulations of fire-damp are discovered from time to time. There appears little doubt that one of the three fearful explosions which have occurred within the last twelve months (the explosion at Llanerch Colliery, near Pontypool) was caused by the continued employment of naked lights in a mine where inspection constantly revealed the presence of fire-damp. This explosion, and two other terrible disasters—at Mossfield Colliery, in Staffordshire, and at Morfa Colliery, near Swansea—which have occurred since the last meeting of the Association, may have seemed to weaken the belief that the operation of the recent Mines Regulation Act must have resulted in very substantial improvement in the management of mines and in the conduct of work by the men. Happily, however, there is a consensus of opinion among those most competent to judge—*i.e.*, the Government Mine Inspectors—that very decided benefits have already accrued from the operation of the new Act. We may hope, moreover, that the operation of the Act is paving the way to more comprehensive legislation in the near future; for it can scarcely be doubted, by the light of recent sad experience, that there are directions in which both masters and men still hesitate to adopt, of their own free will, measures or regulations, methods of working or appliances and precautions, which

are calculated to be important additional safeguards against mine accidents, and which are either left untouched or only hesitatingly and imperfectly dealt with in the recent enactments.

#### Railway Routes to the East.

In the Geographical Section, on the second day, Sir Frederic J. Goldsmid read a paper on "Railway Routes from Europe to India." It was intended as a supplement to one read in June, 1878, at the Royal United Service Institution, on "Communication with British India under Possible Contingencies." The main object on that occasion was to advocate the construction of a line of railway connecting the eastern shores of the Mediterranean with the western coast of India by a direct, convenient, and politically expedient route. It was not originally laid down with any precision what should be the actual course taken by the through line to India when branching off from the Lower Euphrates. Surveys and reports by recent travellers had now rendered it easy to supply this link of rail, one which might be appropriately called the Baghdad-Bandar-Abbas section, or, more minutely, the Baghdad-Shiraz and Shiraz-Bandar-Abbas sections. As to the route from Bandar-Abbas to Karachi on the east, and from Baghdad to the west, any doubts or difficulties that presented themselves were already ripe for discussion, and their solution would not be treated as dependent upon further travel and research. It was proposed to carry the line from Baghdad through Persia, Arabistan, either by way of Dizful and Shushtar, continuing along the recognised track from the latter place to Behehan; or by an alternative route down the left bank of the Tigris, and *via* Hameizah to Ahwaz, whence Major Wells, R.E., had furnished full details of the route from his own experiences. The same officer had made, moreover, very valuable suggestions on the mode of reaching Shiraz from Behehan. After mentioning other routes available, Sir F. Goldsmid said that he had great faith in the drastic remedy of the iron-rail and locomotive to awaken a slumbering but active-minded people, for whom it would be a novelty of high price and usefulness. He did not, however, disguise the fact that the scheme of railway which he described had not had its origin in the mere wish to benefit a particular nation, but rather in the intention of putting in a 900-mile link in the inevitable great line, which would some day connect England with her Indian Empire, and which should be as readily available to passengers and goods as any of the more popular and successful lines at home.

#### Cable Tramways.

In the Mechanical Science Section, on the third day, Mr. W. Newby Colam read a paper on "Cable Tramways." He thought that the present was not an inopportune time for bringing this subject under the consideration of the British Association, because the conditions imposed upon the public had so changed of late as to make it necessary to adopt some system of locomotion whereby the public could be carried at cheaper rates, and more quickly, than by the plodding horse. He briefly referred to the various means of utilising electricity, air, steam, gas, and ammonia for street traction, and considered that only two of them had been working a sufficient time to afford a commercial test which would survive. These, he said, were the cable and steam locomotives. Of the electrical motors undergoing commercial trials abroad, he was of opinion that the storage system was the only one likely to be seriously entertained in this country for street purposes. The author hoped that the day was not far distant when it could be proved that this means of applying electrical locomotion in streets could be worked at a fair remuneration over the average roads, because he considered it would then have a big field of operation. He, however, had formed the opinion that electrical engineers had many difficulties to surmount before this class of motor could face the varied work of ordinary streets and pay well in this country. Steam-engines were, in his opinion, not likely to receive much attention in the future for the purpose of traction through streets, but he thought they would be found useful as a means of connecting districts. Under the circumstances, he suggested that the cable might be found the mechanical power to supersede horses in cases where horses were clearly not capable of meeting the new



conditions of travel. The author next described the origin of cable tramways. He said success had attended almost every inauguration in America and elsewhere, notwithstanding quite unnecessarily large capital outlays. There are at present 501 miles of cable tramways at work, which carried last year in the States nearly half a hundred millions of people, or nearly double the passengers carried in Great Britain and Ireland. Abroad dividends of 74 per cent. had been earned, and in England they were now being worked at 4 per cent. of the gross receipts. Mr. Colam gave his opinions as to the requirements to be observed in designing cable tramways in order that they might meet with the approval of local authorities and ensure economical results. He described two lines he had made in Edinburgh, and he ventured on a prediction that the low constructional and equipment cost of such a system would not fail to attract the attention and demand the consideration of tramway authorities. In concluding his paper, the author spoke of the remarkable success which had attended the working of cable tramways in Chicago and also in the Brooklyn district of New York.

#### The Utilisation of Compressed Air.

In the same Section, Professor A. Lupton read a paper on "The Pneumatic Distribution of Power." In his opening remarks, Professor Lupton said he did not intend to go over ground which had already been trodden by other scientists, and on similar occasions to the present. He said he should chiefly confine his observations to the experience which had been derived from the working of this system in Birmingham, and he remarked that the subject would be of peculiar interest in Leeds, because local authorities had obtained an Act of Parliament for the use of compressed air throughout the borough. He showed how the supply of this air through a meter induced economy on the part of the consumers, and he provided the section with numerous interesting particulars as to the use of this system in the propelling of trams, in the working of the electric light, for various domestic purposes, and in Paris for the emptying of cesspools. At considerable length he showed the great advantages of a power suitable for large or small motors that could be cheaply and safely introduced in workshops, houses, and shops—a power that could do the heavy work of a millcourse or sawworks, and the light work of the tailor, remaker, printer, hairdresser, and grocer; it would drive dynamos for electric lighting, and had many other applications, as was, he said, universally admitted. In Birmingham there were three steam-engines of 1,000-horse power which compressed air to a pressure of 10 lb. above the atmosphere, and delivered into pipes which were laid in the streets like gas-pipes, and over four miles of the pipes were laid. The works had only just left the hands of the contractors, but already there were forty customers for air power, some of whom at a distance of one and three-quarters miles from the compressing station. The loss of power by friction in the pipes was so slight that no ordinary gauge could show it—practically, there was no loss of power due to this distance. The engines of consumers varied in size from  $\frac{1}{2}$ -horse power to 50-horse power. At one works they were using about 100-horse power, which drove five engines, also the blacksmiths' fires, and was also used for iron smelting, and was also used for several novel processes, including labour and material, that had been covered since the power was laid on. Some faultily had been found in getting a good meter, but Mr. Abraham had now invented and patented a meter that was correct within 1 per cent. There was now a demand for the power, which gave satisfaction to those who had tried it. Some people had actually moved into the district for the sake of the convenience of having power without having to erect a boiler and chimney. Comparing the mechanical results with the prophecies that were uttered in 1866, he mentioned that then it was alleged by him that the engines as designed could not be trusted, but they had been now safely set to work. It had also been asserted by some that the loss of power in compressing was such as to be 25 to 30 per cent. was the maximum portion of the original steam-power that could be used by the consumer's engines. The results, however, had entirely confirmed the statements of the engineers, Messrs.

Sturgeon and H. Robinson. At one works visited by him (Professor Lupton) the indicated horse-power of the consumer's engine was equal to 73 per cent. of the indicated horse-power of the steam-engines at the compressing station,—a result which he considered very satisfactory. This result was partly due to the re-heating of the air in a stove, where the sweepings of the workshop were consumed without cost. In consequence, he said, of these satisfactory mechanical results, the Air Compressing Company were about to extend their works. The Professor went on to say that compressed air could be used for working tramways under the patents of Hughes and Lancaster. Under this system a pipe was laid in the streets for the supply of compressed air to the cars, which cars carry the machinery for propulsion, and can ascend any gradient that a locomotive can mount, and take in fresh supplies of compressed air at every stopping-place, an operation which can be effected without actually stopping the car. An experimental car on this principle had been run on the Chester Tramway.

#### A Possible New Process for Copying Drawings.

In the Chemical Science section, on Tuesday last, Mr. A. G. Green read a paper entitled "The Action of Light upon the Diazo Compounds of Primuline and Dehydrothiolumidine: a Method of Photographic Dyeing and Printing," prepared by himself, Charles F. Cross, and Edward J. Bevan. In the course of the paper Mr. Green said it had long been observed by him that the diazo compound of primuline was very sensitive to the action of light, being readily decomposed thereby, and losing its property of combining with phenols and amines. Upon this fact they had now founded a photographic process, by means of which designs can be produced in fast colours upon cotton, silk, wool, linen, or other fabrics. It can also be applied to wool, xylonite, celluloid, paper, or to gelatine films upon glass, thus affording a very wide range of employment. The process, which is a very simple one, merely depends upon the fact that if a material containing diazotised primuline be exposed to light under a design, those parts which are acted upon by light will be decomposed, whilst the parts protected from the light will remain unaltered, and consequently, on subsequent development with a phenol or amine, will produce colours, whilst the decomposed portions will not. The details will, of course, depend somewhat upon the material to be treated. Paper for copying drawings, &c., is coated on the surface with primuline by means of a brush or roller. For the production of gelatine films upon glass the primuline is incorporated with the gelatine before being applied to the glass. In place of ordinary primuline the homologues already mentioned may be used. For silk and wool the primuline may be replaced by dehydrothiolumidine-sulphonic acid, by means of which colourless backgrounds may be obtained. Concerning the reaction which occurs when the diazo-primuline or the diazo-dehydrothiolumidine is decomposed by light, nothing definite could as yet be said, except that the diazo group is completely destroyed; for on treatment with sodium hydrosulphite (true hyposulphite) it cannot be converted into the amido-group (reforming primuline or dehydrothiolumidine). The reaction may consist in a replacement of the N<sub>2</sub> group by OH or by H, or may be even more complex. Although it could not be affirmed that this reaction to light is a property of the diazo-compounds of this group of bodies only, yet it is certain that they possess an extreme susceptibility to light, far greater than that of other diazo-compounds, whilst at the same time they are far more stable to heat. It is thus possible that this property may depend in some way upon the sulphur which they contain.

The President (Prof. T. E. Thorpe) remarked that Mr. Green's discovery was another instance of history repeating itself. The old process of reproducing architects' and engineers' plans on a blue background with white lines was likely to be run very hard by the one they had had unfolded to them by Mr. Green. When Sir John Herschell occupied the post he (Professor Thorpe) now filled, on the occasion of the previous meeting of the British Association in Leeds, the blue background process was in full vogue; now they were likely to have another in its place.

Professor Hummel and Mr. C. H. Bothamley also spoke, and in reply,

Mr. Green stated that as yet he had not succeeded in getting an absolutely white background, but he believed that it would ultimately be obtained.

#### Permanency of Colours

In the same Section, Professor J. J. Hummel, of the Yorkshire College, concluded a paper on "Fast and Fugitive Dye Stuffs" with the following words:—"I do not forget that many people abhor excessively bright colours, and the much-maligned aniline dyes are considered on this account most unworthy of our attention; they jar on the æsthetic taste, they are crude and inartistic. No doubt this is perfectly true, when they are used singly, and are inharmoniously arranged; but, given a good range of brilliant colours, it becomes possible, by their varied combination, to produce the most thoroughly pleasing and attractive shades of greys, and olives, and browns, and the thousand and one delicate tints beloved by the artist, and they yield, when desired, such as possess a richness and life and body of colour, compared with which the older colours are poor and lifeless. Let the artist, inexperienced perchance in the application and proper use of coal-tar colours, confine his attention if he wishes to the more sombre and older dye-stuffs, but do not allow him to persuade you that there is neither beauty nor permanence, or other quality of excellence, in any of the coal-tar colours of to-day. Employ them, at least, with discretion, with intelligence, and they will not fail to recommend themselves to your better judgment. Rather than describe their discovery as useless, even from an artistic point of view, I would say, all honour to the founder of the coal-tar colour industry. If, in the beginning, he gave us the fugitive mauve, did he not afterwards labour hard and successfully in the cause of the fast artificial alizarin? All honour, then, I say, to Dr. Perkin, who has been instrumental in giving to the world not only fugitive but fast coal-tar colours."

A short discussion followed, in the course of which

Professor Hartley (Dublin) observed that as the result of experiments he had made he had come to the conclusion that they might expect water-colour drawings to last 400 years, provided they were protected from the influence of direct sunlight. Indigo was sometimes considered a fugitive colour, but whether it was or not depended very much on the nature of the indigo and on the drawing-paper. Even the best drawing-paper was invariably acid, and a wash of indigo on such paper was bound to be affected by the acid.

#### Coal-fields in South-East England.

In the section of Geology, Prof. A. H. Green, F.R.S., presiding,

Mr. W. Topley, F.R.S., read a paper by Mr. W. Whitaker, entitled "Suggestions on Sites for Coal Search in the South-East of England." In the course of some preliminary remarks he explained that as the result of our knowledge acquired in late years it was known that the beds were thick in the south of Kent and in Sussex, and that a great depth would have to be gone to in order to reach the mineral. If they sank near the North Downs, or to the north of that, the beds would probably be found to be thin, and the coal, if present, would be reached at a much less depth. The paper set forth that the general question of the rise of older rocks beneath the Cretaceous beds of South-eastern England was now so familiar to geologists that there was no need to discuss it, but the practical application of their knowledge of the subject was in its infancy. Having regard to the great expense of making the deep trial-borings that would be needed in the search for coal, it was clearly well, as far as possible, to select sites where a good amount of work had been already done. The object of this paper was to point out that there were such sites, and that they were favourably placed for the search. Sites were then noticed, beginning at the south-east, near the only place where coal had yet been proved in the large tract in question, and working thence westward and northward.

Professor McKenny Hughes commented on the actual direction and amount of the dip of the Devonian and Silurian rocks discovered in the borings north of London having been ascertained, and argued that the coal basins would be found on the dip side of these points. Geologists had been formerly accurate, and they now asked the confidence of the public with regard to the existence of south-eastern



coal measures. There was the aesthetic question; but by the development of these fields the solution of the smoke question was forced to completion, the present work would greatly benefit the country. But wherever there were coal seams they must have the long chimney, since the progress of civilisation could not be stopped. If landowners could be induced to co-operate and to agree upon borings in a reasonable and systematic way, the disfigurement of a large area might be saved, while a new industry could be introduced, and trade in that part of the country resuscitated.

Mr. W. A. E. Ussher and Mr. De Rance combated Professor Hughes's views, Mr. De Rance remarking that it by no means followed that the coal measures lay conformably upon the more ancient Palaeozoic rocks, which might have been turned on end and eroded before the more level coal measures were deposited on the upturned edges. Therefore the dip of the more ancient rocks would be no clue to the position of the overlying coal measures. The borings at Burford, to the west of Oxford, showed coal measures in the secondary rocks.

#### Ordinance Survey Maps.

In the Geographical Section, on the 9th inst., Mr. Henry T. Crook read a paper on "The Present State of the Ordinance Survey, and the paramount necessity for a thorough revision." He said that it was strange that, when the need for accurate maps was daily increasing, there should be a falling off in the sale of the national maps, for the making of which the nation had paid an enormous sum. This was mainly attributable to the fact that the maps did not meet popular requirements. The Ordnance Survey Department had undertaken more than it had the means to carry out in any reasonable time. The Survey had suffered severely from constant Parliamentary interference; and the result was that after more than a century's existence the Department had not completed one of its works. It had not yet produced on any scale a uniform map of the British Isles. Besides other disadvantages, the important question of price affected the sale of the Ordnance maps. An outlay of at least 7s. 6d. was necessary to procure the Ordnance sheets of a district in handy portable form. Of the whole of the southern counties of England no satisfactory topographical map existed, and for the remainder of England and Wales the utility of the existing maps was destroyed by antiquity. The system of agency monopoly greatly restricted the circulation of the maps, and prevented the public at large from obtaining them readily. The establishment of a revision department was absolutely necessary, which could only be done by increasing the proportion of the annual grant devoted to revision. This would not be done unless strong representations were made to the Government. Mr. Crook then read to the section the following letter from Sir Charles Wilson, Director-General of the Ordnance Survey:—

"The Ordnance Survey Department cannot be held responsible for the obsolete character of many of the maps, or for the system under which they are now sold to the public. No one can be more sensible than the Director of the Survey of the pressing need of a revision of the maps; but the question is really one of money, which it is for Parliament, and not for the Department, to decide. I think you underestimate the pressure which has from time to time been brought to bear upon the Government to complete the 25-in. survey of Great Britain; and however much we may regret it, we can scarcely be surprised that the survey was pushed forward at the expense of revision. The result is that in many places revision must now be virtually a re-survey. The present system under which Ordnance Survey maps are sold by sole agents for England and Wales, Scotland, and Ireland respectively, was adopted, as you remark, contrary to the advice of the Director of the Survey. Mr. Chaplin, however, under whom the survey now is, stated, in reply to Mr. Webb, last session, that 'when a favourable opportunity occurred a change in the system would be carefully considered.' I believe that under a proper system the sale of the maps would be enormously increased. I must point out one or two errors in your generally accurate paper. The 6-in. map of the kingdom was completed in March last; that of Ireland has long been completed, and is officially recognized as the basis for all dealings in land and for valuations for local assessment. About one-half of the 6-in. map of Ireland has been revised to date on that scale. Until recent legislation with regard to land in Ireland, the 6-in. map was considered large enough for all practical purposes by those who used it, and the necessity for a 25-in. survey has only been felt during the last few years."

Sir Douglas Galton said it would be well if the British Association could be induced to address the Government on the subject, in order that the whole question of the position of the Survey, and of the sale of the maps, might be thoroughly agitated and discussed, especially now that they had transferred the Survey from the Office of Works to the Board of Agriculture,

where no doubt Mr. Chaplin would be most anxious to do everything he could to promote the welfare of those who wanted maps,—the farmer being one of those who was most urgently in need of them. He therefore strongly urged the section to pass some resolution on the subject. Perhaps the Council might be requested to consider the question during the recess, so that some strong representations to the Government might be made. They were all very much indebted to Mr. Crook for having brought the subject forward.

After some further discussion, on the motion of Sir Douglas Galton, it was resolved that the Council should be requested to consider the matter in the recess, and that strong representations should be made to the Government on the subject.

#### Measurement of Elongation of Test Samples.

In the Mechanical Science Section, Mr. J. W. Wicksteed read a paper on "Measurement of Elongation in Test Samples." He stated that when a bar of metal is stretched with a longitudinal pull, it first extends generally throughout the whole of its free length, after which, especially in best iron, mild steel, and copper, it extends locally about the place of final fracture. The "general" extension continues so long as the bar offers increasing resistance to the pull, and from the end of that stage to final fracture the extension is local. The general extension is unaffected by the shape or proportions of the specimen, and may be correctly expressed in units of its own length. The local extension bears no relation to the length of the specimen, and should, therefore, be expressed in standard units of length. The usual engineering practice of the present day is to measure the total extension, and to express it in percentage of the original length of specimen; but this practice makes it difficult to draw correct comparisons of ductility between different experiments, unless the specimens have been all made to the same pattern. It also prevents the value of the material being discriminated as between capability for stricture and the capability for stretching without loss of strength. The author described a method for separating the measurement of the general extension from the local, and recommends a column in test reports of "per cent. general extension," leaving the present column of "per cent. contraction of area" to record the capacity for stricture, and the present column of total extension in inches, from which the local extension can be deduced by subtracting the recorded general extension from the total as measured after the sample is broken.

Next week we may notice briefly one or two other papers read before the Association.

#### AWARDS AT THE BRIGHTON HEALTH EXHIBITION.

THE preliminary list of awards at the Brighton Health Exhibition, of the contents of which we gave an account a fortnight ago, was made known on Friday last, but an official copy of the list has not reached us. We select (and correct) the following from the list as published in the *Sussex Daily News*:—

#### Medals.

Clemens, Abell, & Co., for street-sweeping machine.  
W. H. Allen & Co., for sanitary publications.  
London, Brighton, and South Coast Railway, for exhibit of railway rolling-stock and appliances.  
J. Stott & Co., for mercantile gas governor.  
G. M. Hammer & Co., for school furniture.  
P. C. Calvert & Co., for carbolic acid preparations.  
Washington Lyon, for steam disinfecter.  
Burmantofts Works, Leeds, for decorative pottery and faience; also for decorative glazed faience fireplaces.  
Moule's Patent Earth Closet Company, for earth closets.

Joseph Cliff & Sons, for "Cecil" stop sink; also for Imperial porcelain bath.  
J. Tylor & Sons, for "Ariston" stop-sink water-closet.  
Hayward Bros. & Eckstein, for self-acting coal-plate; also for semi-prism reflecting pavement and roadway lights.  
John Greenall, Portland-street, Manchester, for steam washer.

#### Certificates.

Merryweather & Son, for armoured india-rubber hose.  
Sanitary and Domestic Engineering Company, for gradient indicating block.  
Thomas James Moss Flower, for adjustable clinometer; also for Watts' sphygmometer and testing drains.  
C. Kite & Co., for wall inlet ventilator.  
Brighton Waterworks, for Baber's water hydrant.  
Clemens, Abell, & Co., for improved chain-pump; also for street watering van.  
Joseph Cliff & Sons, for white enamelled fire-clay sink; also for Winner's channel bends; also for Stokes' gully; also for Beaucliff disconnecting trap.  
J. Tylor & Sons, for lavatory basins and fittings; also

for weir overflow valve water-closet for lead trap; also for "Column" water-closet.

Boetel Bros., for lavatories.

John Smeaton, Son, & Co., for Imperial spray bath; also for excelsior dust-shoot.

Burn & Baillie, for combination bath; also for hinged grating for overflow of bath; also for lavatory with covers which can be cleaned; also for improved urinal; also for cast-iron drain-pipes, inspection chamber, and trap; also for brass traps for baths and sinks; also for indiarubber expanding plug for drain-testing.

Doulton & Co., for special urinal.

Boetel Bros., for collar-joint for connection of soil-pipe to water-closet.

D. T. Boetel, for union-joint for connection of soil-pipe to water-closet.

Imperial Smoke Consumer Company, for boiler covering bricks.

J. Halsae, for china slop-pail.

George Hammer & Co., for church fittings.

Edward Wyborn, for case showing the relative constituents of various milks.

The Morris Tube Ammunition Company, for circular arrangement for filters.

T. B. Durrans & Son, for metallic-jointed man-hole cover.

Wire-Wove Roofing Company, for wire-wove roofing.

George Hammer & Co., for church fittings.

H. Heim, for cast and sheet iron ventilating gratings, with Louvre valves; also for round ventilating valves.

Hayward Bros. & Eckstein, for mica-plate outlet ventilator with "hit and miss" air bricks; also for ornamental "hit and miss" air bricks; also for "The Southwark" universal Venetian ventilator.

Smith, Collier, & Co., for Venetian blind fittings.

Reves & Co., for wood mouldings.

Henry Cresswell, for decorative tiles and pottery.

J. Halsae, for artistic pottery and porcelain.

Eagle Range Foundry Company, for Eagle grate.

C. B. Reed & Son, for stoves, mantelpieces, and brasswork.

Peters, Bartsch, & Co., for chemical heat retainers.

#### Illustrations.

#### COMPETITION DESIGNS FOR PARLIAMENT HOUSES, ROME.

THE two designs here illustrated were among the premiated designs in this important competition for a grand Parliament House for Rome, which was decided early in the present year, but which, like some large competitions nearer home, proved an abortive affair, the committee appointed to consider the designs declining to recommend any one of them for execution, though bestowing premiums on several. There is a dignified character about the two which we illustrate, by Signor Moretti, and by Signori Broggi & Sommaruga, which renders them worth illustrating as designs; though they are not destined to enter into the stage of execution.

Forty-nine designs were submitted, from among which eight only were selected for serious consideration. Of these, the designs by Signori Broggi & Sommaruga, Moretti, Quaglia, Benvenuti, Rastori, and Basile, received each a premium of 5,000 francs; and those by Signori Giampietri, Manfredi, and Magni, received each an honourable mention and a premium of 3,000 francs.

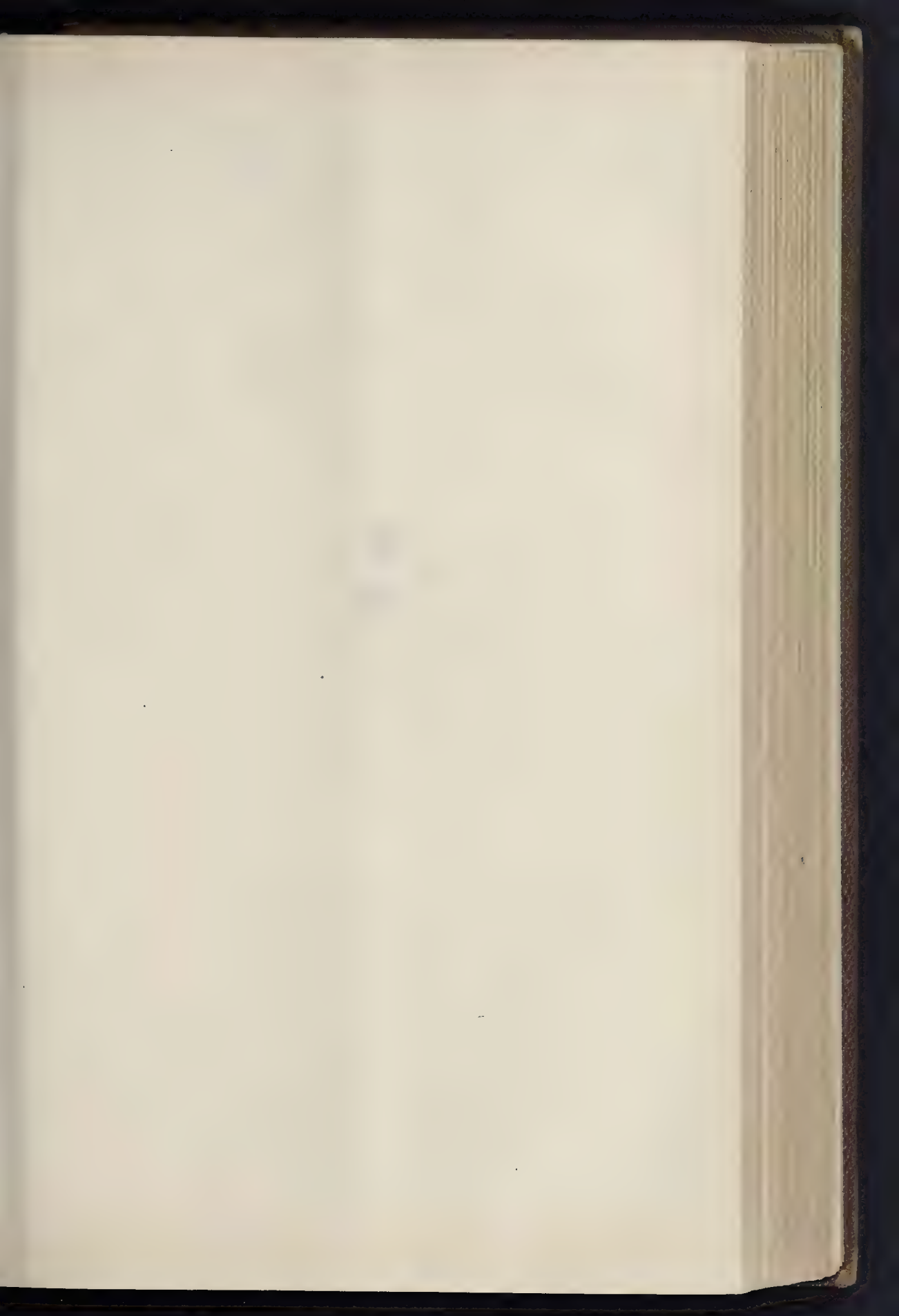
Signor Moretti's design, of which we give the principal elevation, was generally regarded as architecturally the best. The three domes which mark the three main internal divisions of the building, are obviously to a certain extent inspired by the style and treatment of the Pantheon dome. The design by Signori Broggi & Sommaruga was generally regarded as next in merit. We give the plan of this, which is fine on some respects, but the principal external feature is very ponderous in effect. Both designs may be of interest, however, as examples of modern Renaissance design by architects of the last of the Renaissance.

#### MONUMENTAL BRASSES.

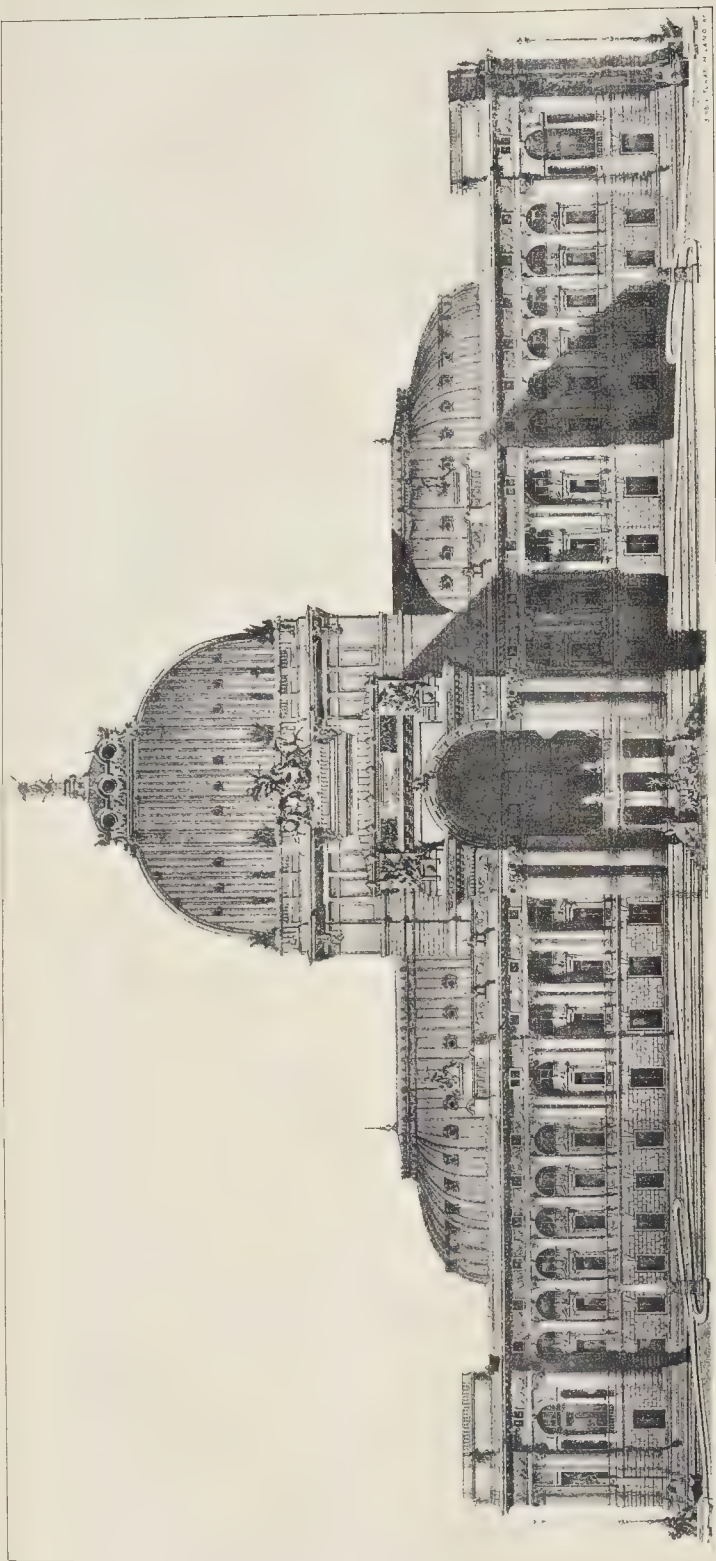
THE two brasses which form the subject of our illustrations are declared by many good authorities to be the two finest examples which exist in England at this present time. A few brasses in England present quite a different appearance to the majority; they are for the most part of a large size, and rectangular in shape; the background of them is filled in with elaborate canopied and diaper work. They are a foreign workmanship. To this class Abbot Thomas Delamere, at St. Albans, belongs. The majority are let into stone casements or matrices, of a shape corresponding to the figure, and in that of Sir Robert de Bures, Acton, Suffolk. This is one of the few early fourteenth century cross-legged knights. A full description of it is given in Waller's series of Monumental Brasses.

For the benefit of those especially interested in brasses I may mention that there is no at Cambridge an Association of Brass Collectors (shortly called "C.U.A.B.C."); the correspond-





THE BUILDER SEPTEMBER 13, 1890.



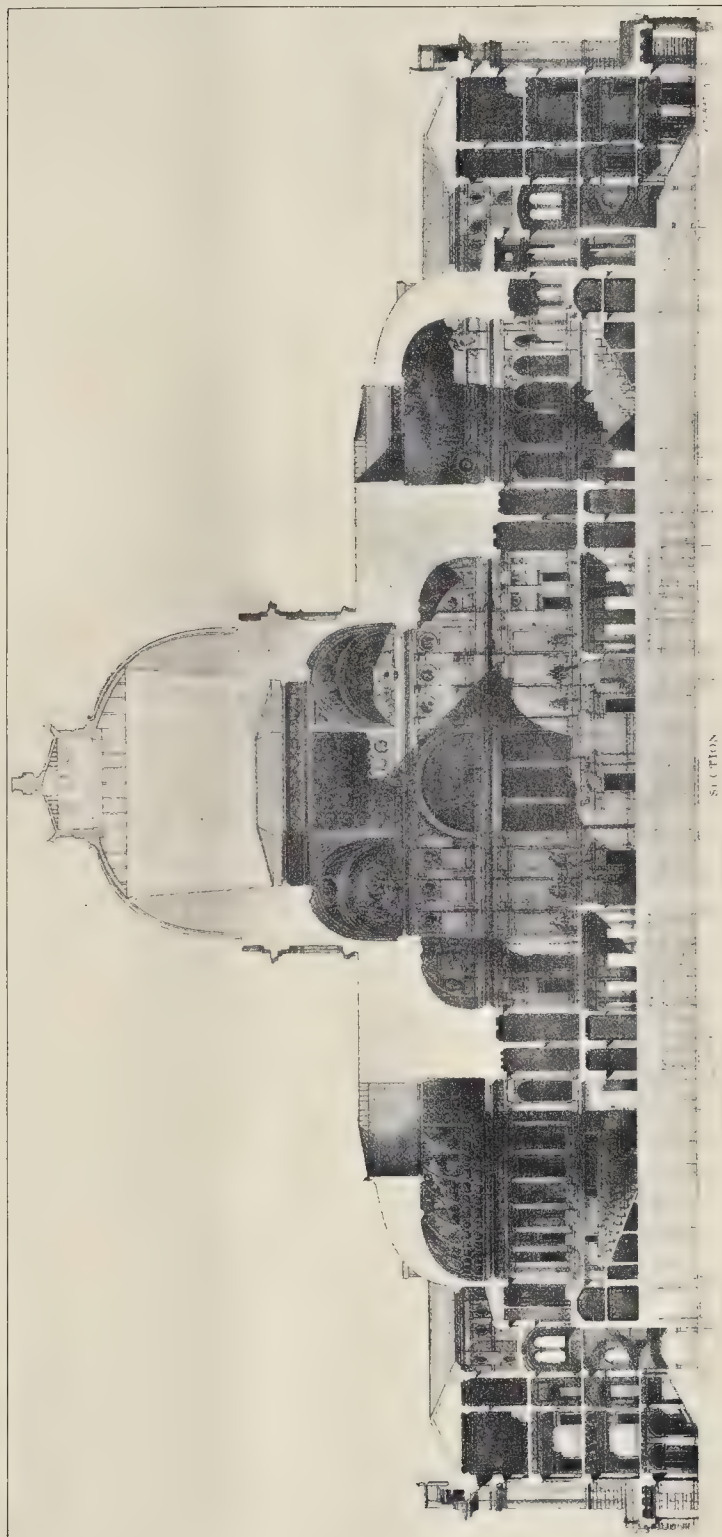
FRONT ELEVATION







SIDE ELEVATION.



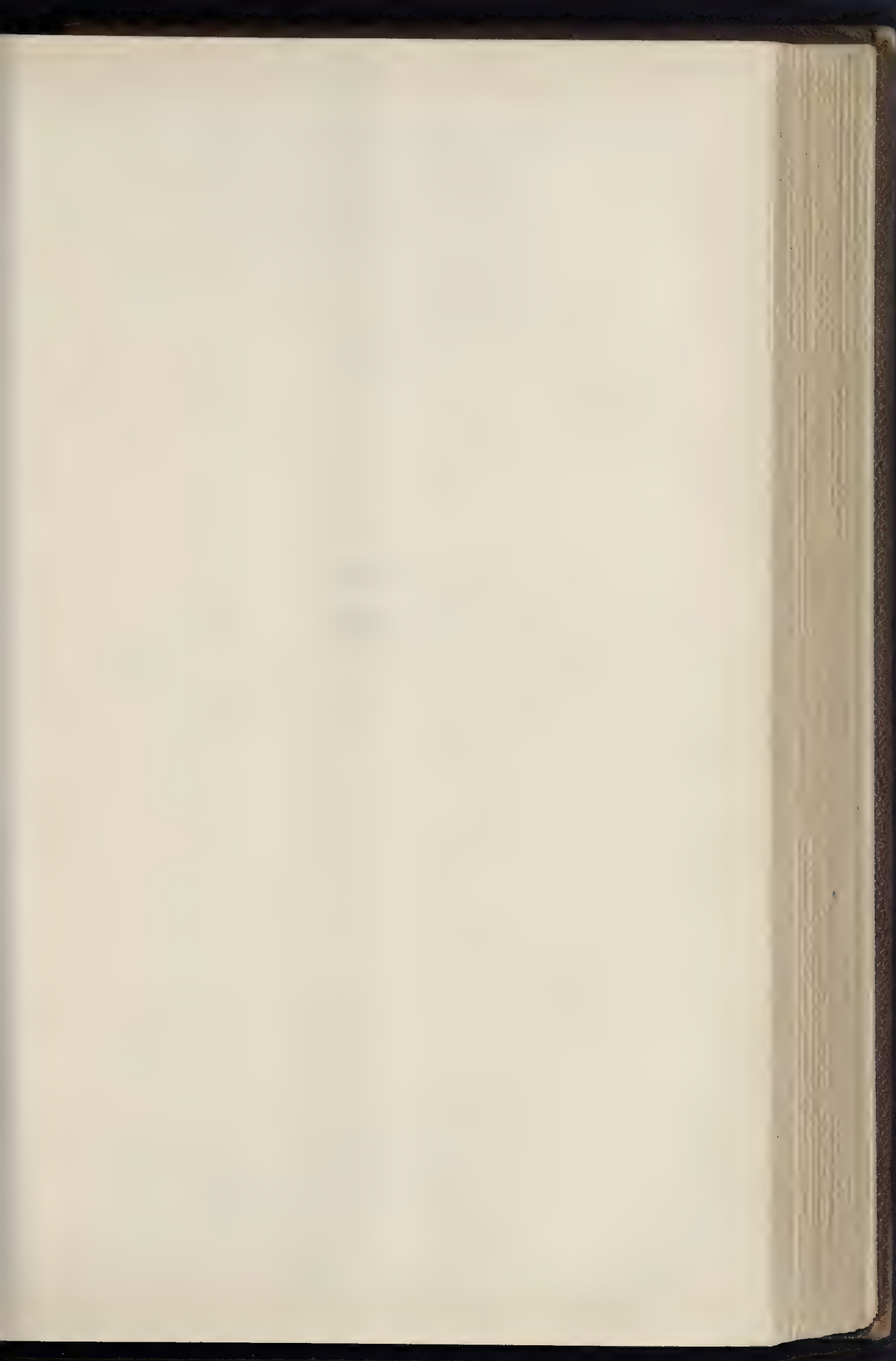
SECTION

THE PHOTO SHOWN IS AN INK DRAWING AND NOT A PHOTOGRAPH.

COMPETITION DESIGN FOR PARLIAMENT HOUSES, ROME.—SIGNORI L. BROGGI AND G. SOMMARUGA, ARCHITECTS.





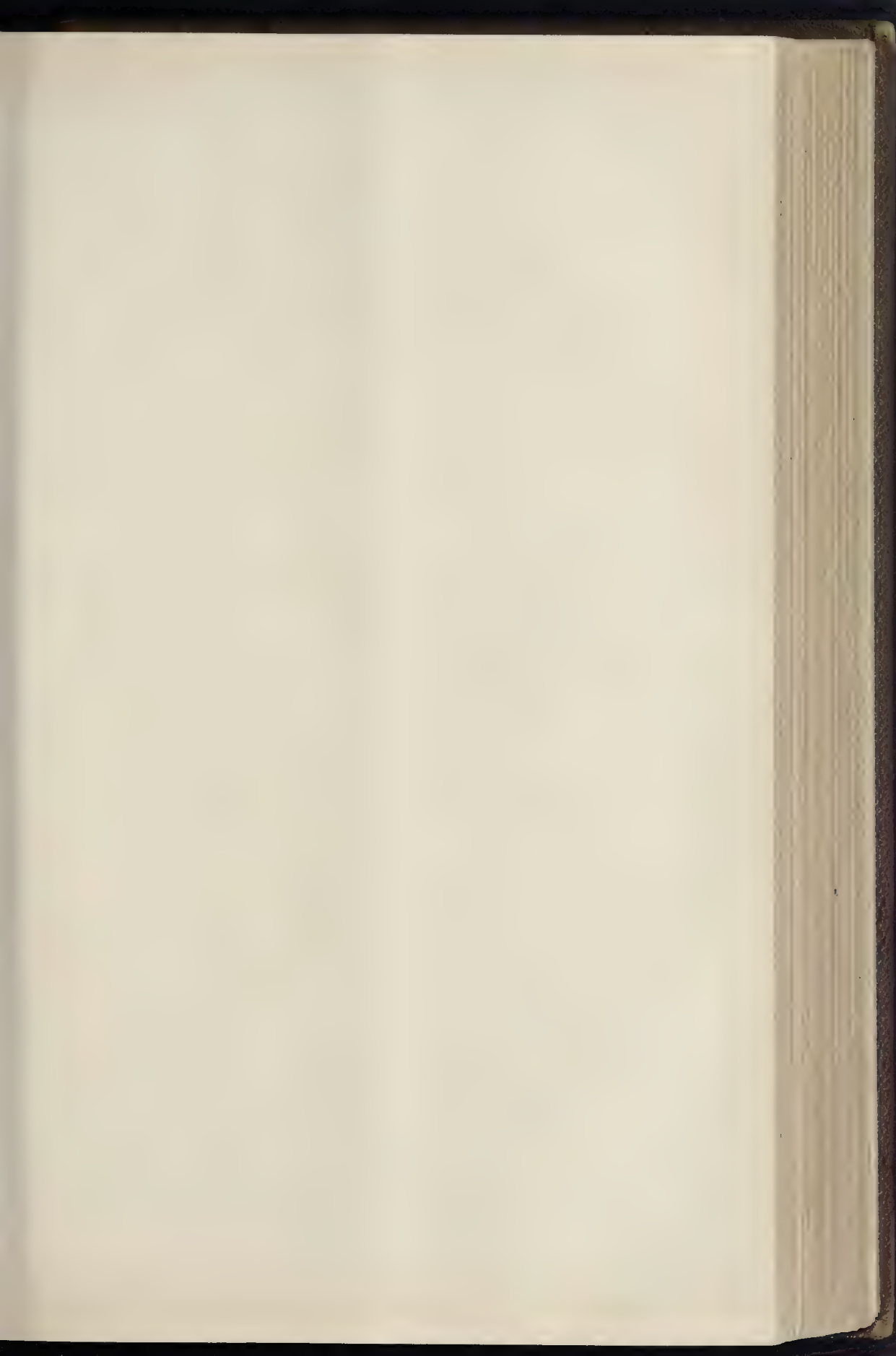


THE BUILDER, SEPTEMBER 13, 1890

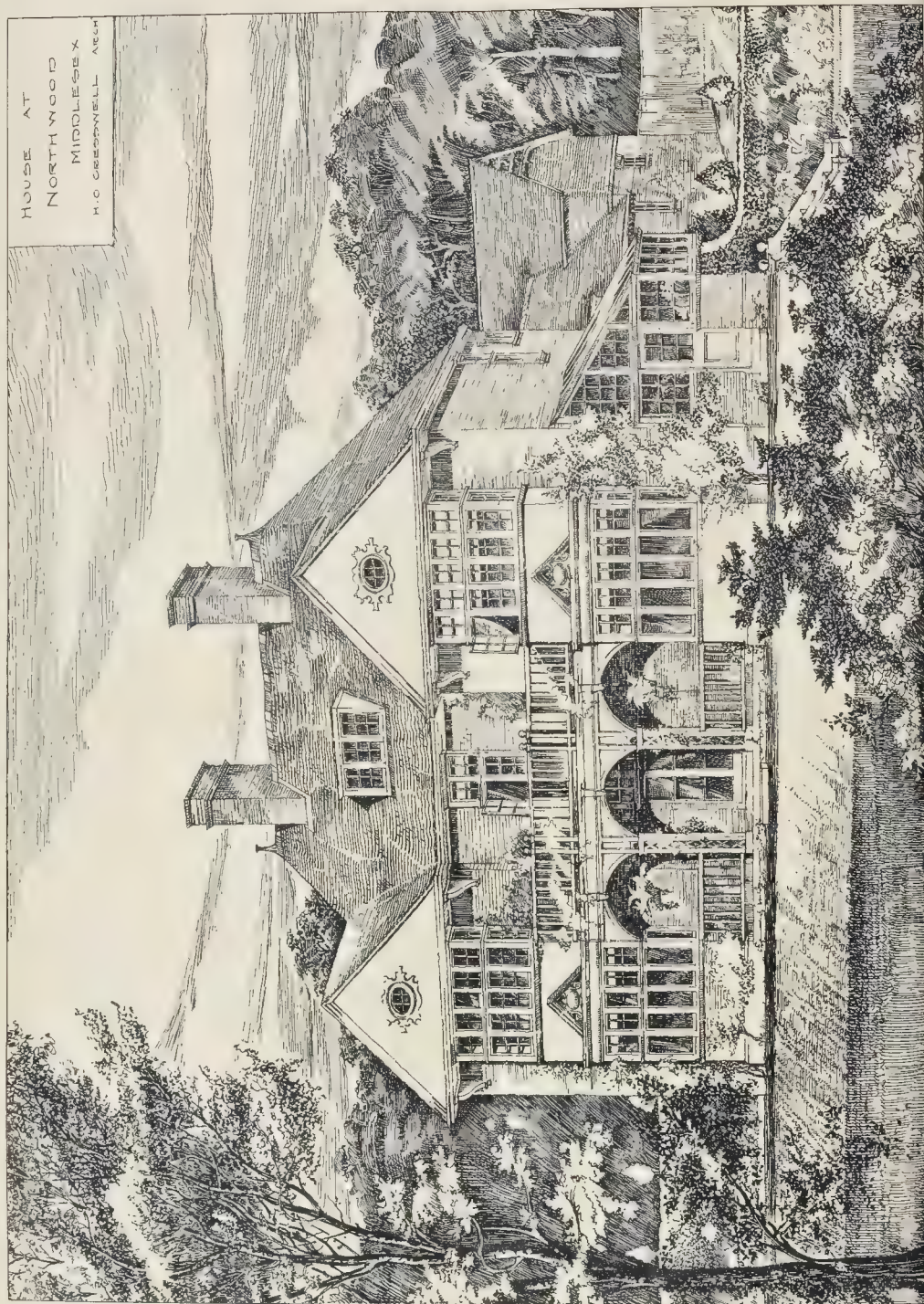


COMPETITION DESIGN FOR PARLIAMENT HOUSES, ROME.—SIGNOR MORETTI, ARCHITECT.  
PRINCIPAL ELEVATION





THE BUILDER, SEPTEMBER 13, 1880







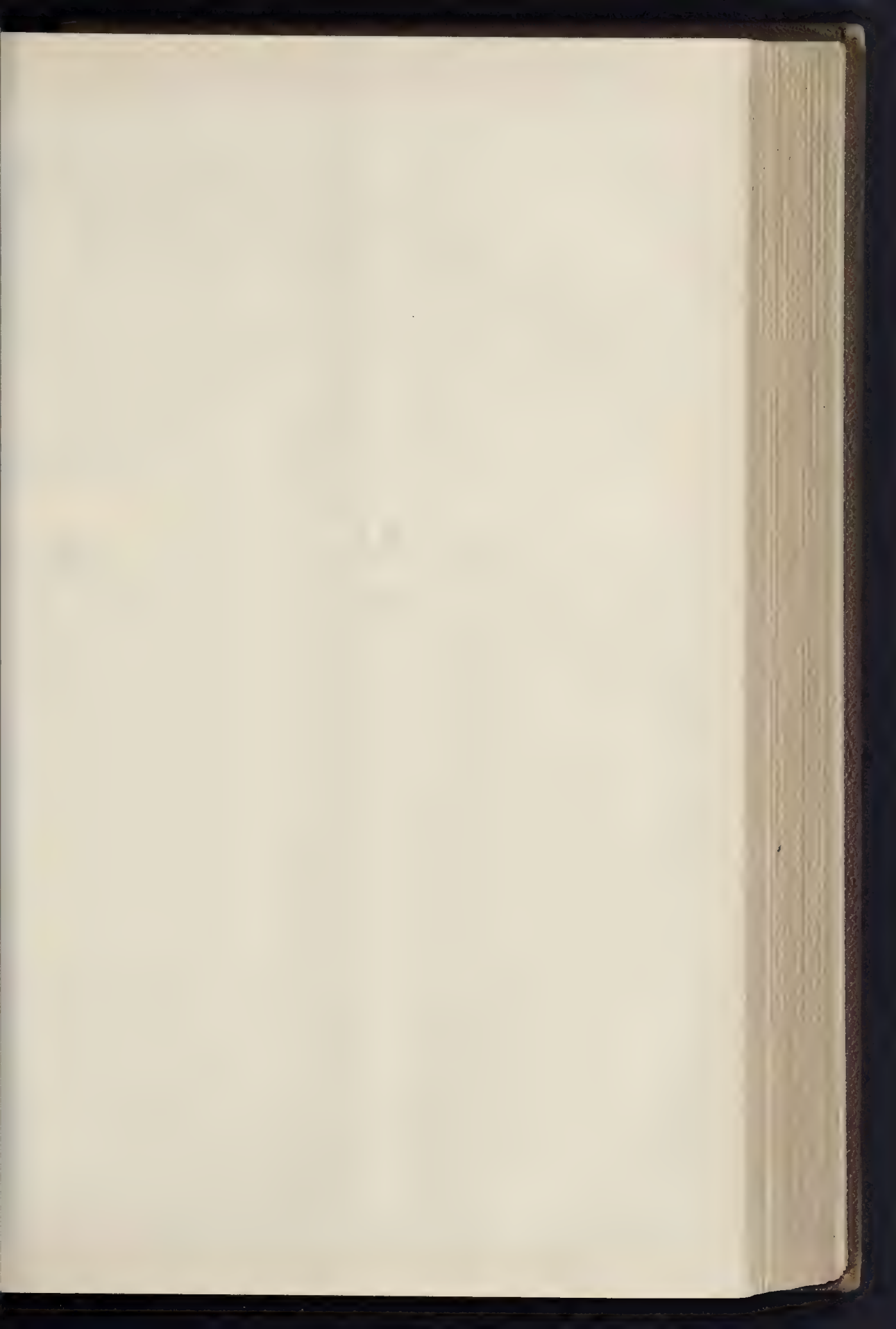
Interior View Looking West.

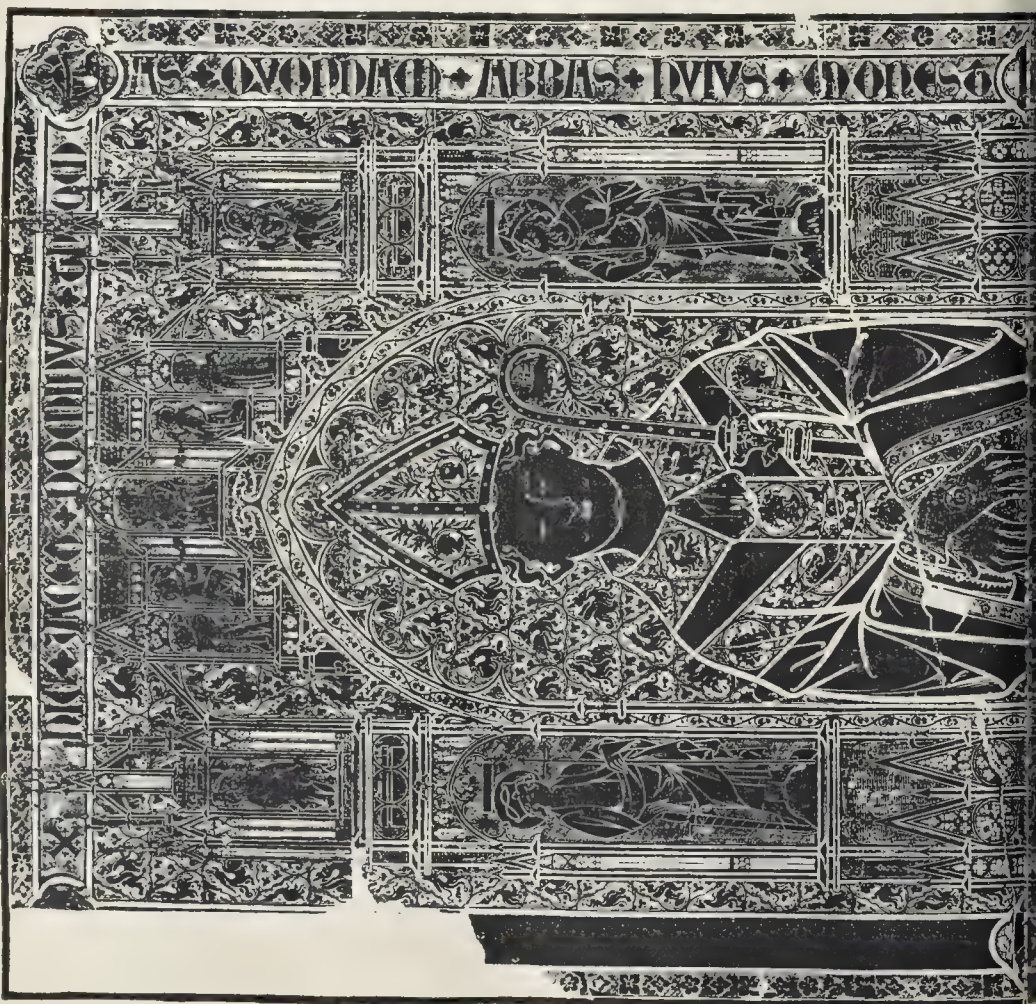
MR. MARTIN BROOKS  
Architect. A.R.B.A.  
33 Wellington St.  
Strand

H.N.D. 5. The Chapel  
from Dr. Schmel's  
Garden.

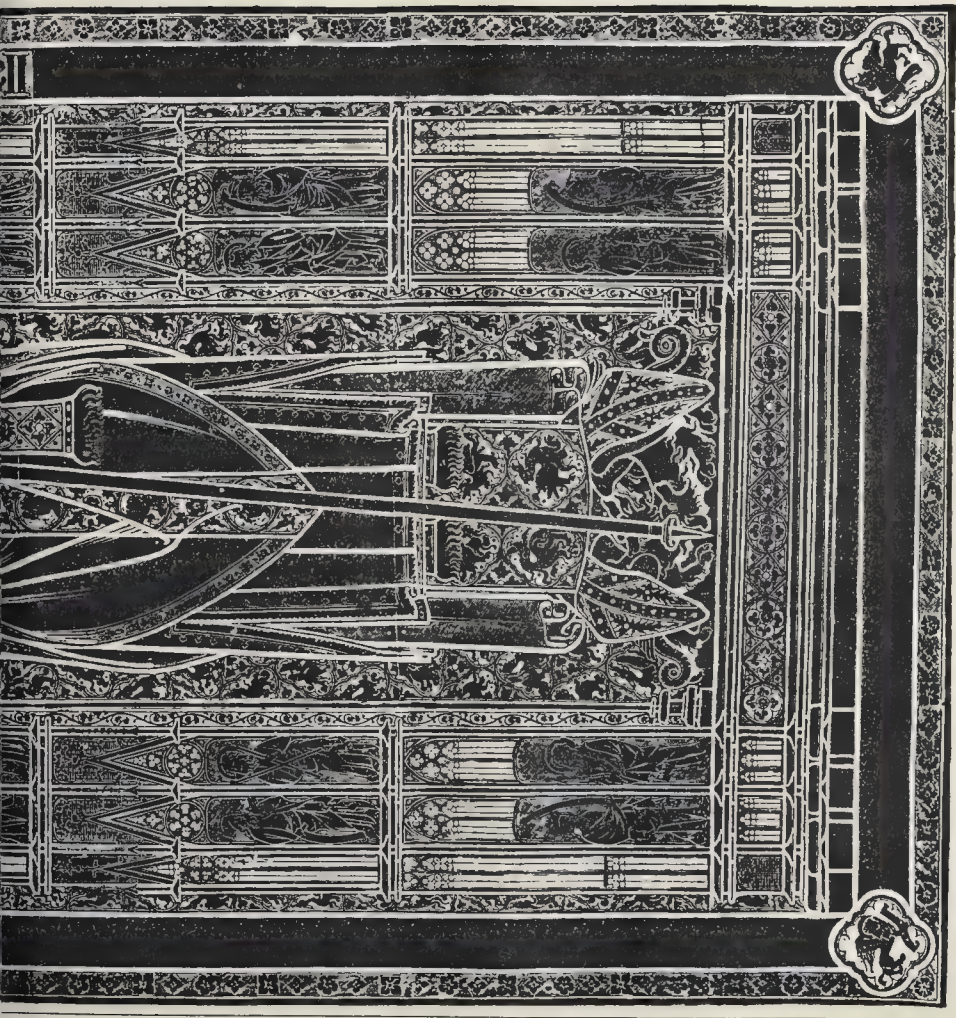




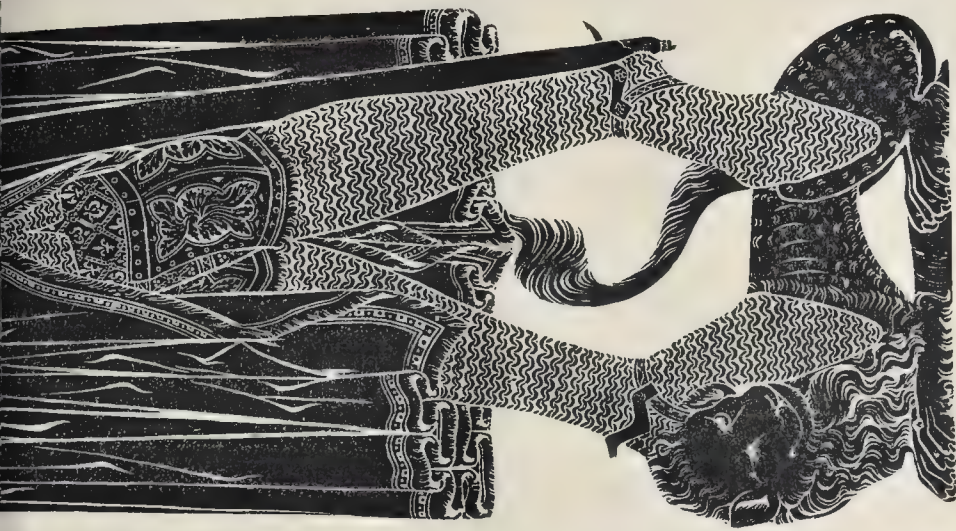








BRASS OF ABBOT THOMAS DELAMERE; ST. ALBANS, HERTS. (*Circa*, 1360—1370).  
 SIZE OF ORIGINAL: 9-FT. 3-IN. X 4-FT. 4-IN.



BRASS OF SIR ROBERT DE BURES; ACTON, SUFFOLK (1302).  
 SIZE OF ORIGINAL: 6-FT. 6-1/2-IN. X 1-FT. 8-IN.







COMPETITION DESIGN FOR PARLIAMENT HOUSES, ROME.—SIGNORI L. BROGGI AND G. SOMMARUGA, ARCHITECTS.  
GROUND PLAN.





ing secretary is Mr. R. W. M. Lewis, of Corpus Christi College. The subscription is merely nominal, the sum of 5s. conferring life membership on those who wish to join. All the latest "brass news" is published in their papers, which also contain a very useful exchange column; by this means members living in distant parts may exchange their rubbings.

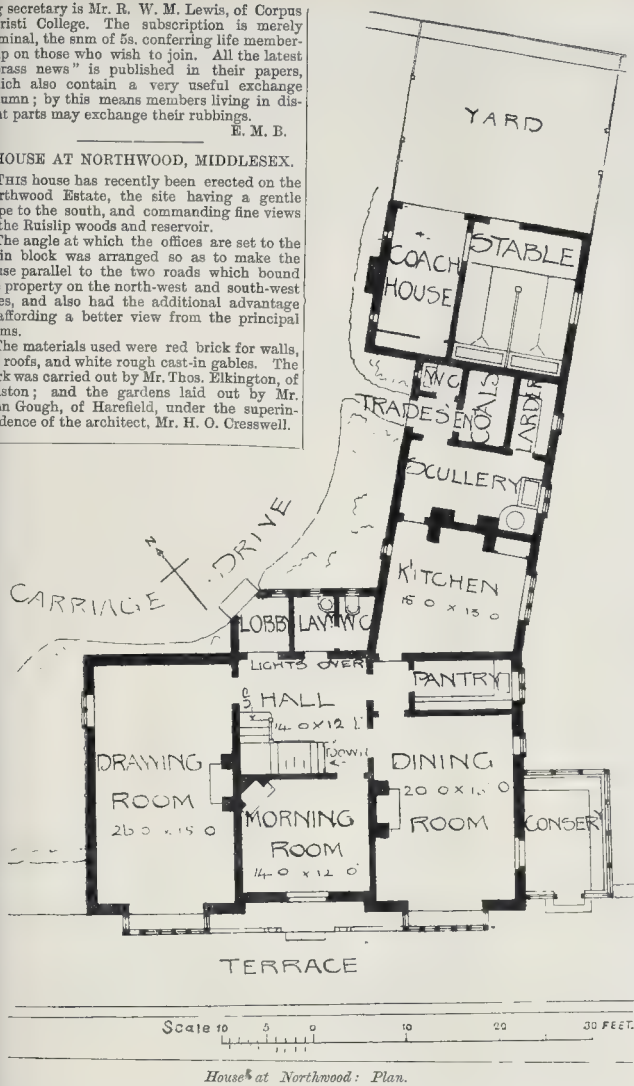
E. M. B.

#### HOUSE AT NORTHWOOD, MIDDLESEX.

THIS house has recently been erected on the Northwood Estate, the site having a gentle slope to the south, and commanding fine views of the Ruislip woods and reservoir.

The angle at which the offices are set to the main block was arranged so as to make the house parallel to the two roads which bound the property on the north-west and south-west sides, and also had the additional advantage of affording a better view from the principal rooms.

The materials used were red brick for walls, tile roofs, and white rough cast-in gables. The work was carried out by Mr. Thos. Elkington, of Dalston; and the gardens laid out by Mr. John Gough, of Harefield, under the superintendence of the architect, Mr. H. O. Cresswell.



#### HOSPITAL CHAPEL, ILFORD.

THE ancient chapel, dedicated to St. Mary and St. Thomas of Canterbury, was founded by Adeliza, Abbess of Barking, in the reign of Stephen; and had a prior, chaplain, and thirteen poor brethren, who were lepers. It was endowed with the tithes of Barking parish, and strict statutes for it were drawn up by the Bishop of London in 1346. At the Reformation its revenues were valued at 16l. annually. Queen Elizabeth granted these tithes and the site to the Fanshaws upon the condition that it was maintained as an almshouse for six poor men, with a chaplain to perform Divine service in the chapel.

The estate is now vested in the Marquis of Salisbury, who is master of this semi-ecclesiastical establishment, and pays the yearly stipend. The chapel dates from the fifteenth century, and prior to the recent alterations was a long narrow building, 74 ft. in length, by 16 ft. wide; it was the only place of worship for the inhabitants of Great Ilford until the erection, in 1830, of the parish church. Recently the church had fallen into a bad state of repair, the walls being 6 in. out of the perpendicular. A deep classic moulded cornice was erected about 1740; in the restoration this was

found to be 2 ft. above the old wall-plate level, which was nearly all destroyed. The wall-plate now is at the original level. The face of rafters was plastered; this has been all taken off, and the face boarded with ribs nailed on at various intervals. The division of chancel is formed by ribs and cusping. The chapel is now 92 ft. long inside the walls. The south wall has been partly knocked out, and five bays formed, and a small one at the west end, this being the entrance to the baptistry. The windows in the south side were in a bad state of repair, the stone works being made up with cement and tiles. These have all been carefully restored, and three new windows inserted, and one in the westward of new aisle. A new Rose window has been inserted in the west-end of the nave, with a doorway under it. The new aisle is 10 ft. 6 in. wide, and runs the whole length of the building; at the interior end are two vestries, these are connected with a new cloister from the chaplain's-house to the chapel. A chapel is being formed at the east end of the aisle, which is fitted up with a baldachino, the drapery and embroidery of which is being made by Messrs. Morris & Co., of Oxford-street, who are about also to put some stained-glass windows in the chapel. Two new iron screens are being made, one for the chancel and one for

the Lady chapel; the choir stalls are in progress—these are being made in Indian teak. Mr. Watson, of Ilford, was the builder, Mr. J. Martin Brooks being the architect for the restoration.

#### FROM AUSTRALIA.

COLONIAL ARCHITECT'S DEPARTMENT,  
NEW SOUTH WALES.

FOR many years the architectural work of the Government of New South Wales has been carried out by an official known as the Colonial Architect, and a large staff under his command. The work of the Department consists of public buildings of all kinds throughout the colony, from the little bush lock-up on the mountains or troopers' quarters in the far west, to imposing stone edifices, such as the Post-office, the Lands Office, or the Colonial Secretary's Offices. Court Houses, Gaols, District Post and Telegraph Offices and Lands Offices, and all other public buildings, with the exception of schools, have been carried out and also kept in repair by the Colonial Architect's Department, and its duties are so extensive as even to include the supply of coffins for the pauper inmates of the various benevolent asylums. To administer such a Department successfully is no mean task, and this has been done by the late Colonial Architect, Mr. James Barnet, F.R.I.B.A., who has just retired after thirty years' service. Most of the best work of the country was thus in the hands of one man, and it has long been a grievance with the profession in Sydney that such should be the case. Advantage has, therefore, been taken of this opportunity to re-organise the Department, and henceforth it is stated that all Government works of over 5,000l. in value will be thrown open to public competition under conditions yet to be settled. The carrying out of those under 5,000l. in value, and the maintenance of existing buildings, of which there are a large number, will be the duty of the new "Supervising Architect," as he is to be called, and Mr. Walter Liberty Vernon, F.R.I.B.A., has just been appointed to the post. No better choice could possibly have been made by the Government. Mr. Vernon is a gentleman in the prime of life, of robust physique, urbane manners, considerable professional skill, and the strictest integrity. He practised in London and Brighton until the year 1883, when he removed to Sydney in order to obtain a more favourable climate than that of England, and with the happiest results. His work here has comprised several large and important buildings and many smaller ones, and for part of the time he has been in partnership with Mr. W. W. Wardell, F.R.I.B.A., the doyen of the profession in Sydney. During the last three years, since Mr. Wardell's resignation, he has acted as one of the hon. secs. for the Royal Institute of British Architects in Australia.

Whether the new scheme of competition for Government work will work out satisfactorily has yet to be proved. Judging by recent information to hand from the old country it has been thought that the system of competition for large Government works has not been found altogether desirable, and that a revision is likely to be made to the older and safer method of appointing an architect of tried skill and knowledge for each important building. At any rate the forthcoming competitions will afford employment to the many architects and assistants in Sydney who at the present time have practically nothing to do, but the spoils will fall to the few. The usual result will follow, that work of greater value will be done by the competitors in the shape of drawings than the successful architect will receive in the way of commission.

GLASGOW ARCHITECTURAL ASSOCIATION.—The usual monthly meeting of this Association was held on Tuesday, the 2nd inst. After the usual business had been disposed of, Mr. Fairweather read a paper on "The Early Period of Greek Architecture," being the first of a series of three on Greek architecture, the next being "The Middle Period," and the third "The Late Period." The essay went over the history of early Greece, beginning at 1836 B.C., when Inachus, a Phœnician adventurer, arrived in Greece at the head of a small band of his countrymen. After giving an account of the tomb of Atreus at Mycenæ, Mr. Fairweather passed in review most of the buildings of the period now remaining. Mr. Potts opened the discussion, at the close of which Mr. Fairweather was awarded a very hearty vote of thanks for his interesting paper.



## THE TRADE UNION CONGRESS.\*

On the third day of the Congress, there was a renewal of the lively scenes to which we made reference last week. But without entering into a narration of the causes of these exciting interludes, we append a few notes as to some of the resolutions arrived at by the Congress.

*Factory and Workshop Disciplinary Fines.*

Mr. W. J. Davis moved—"That this Congress is of opinion that factory and workshop disciplinary fines should be made illegal; and that the Parliamentary Committee be and is hereby instructed to urge the Legislature to adopt such amendments to the Truck Acts of 1831 and 1887 as shall make such practices a contravention of the said Acts." This was seconded and almost unanimously adopted, after being amended by adding words to it suggesting that all fines whatsoever should be made illegal.

*Public Contracts and Fair Wages.*

Mr. Shipton moved—"That this Congress instructs the Parliamentary Committee to take such steps as they may deem most effective to secure at the earliest moment, in all Government work and municipalities, the full payment of the current rates of wages recognised by the organised industries of the United Kingdom." He said that the Government system in vogue at present was to let the contract at the lowest possible price. The consequence was that the firm who had the contract was avoided by all good, skilled workmen, and the whole system was one of degradation to labour and subservience of efficient workmanship, resulting in pernicious scamping in Government work.

This having been seconded by Mr. T. Shaw, Mr. C. Markin said he thought the resolution hardly strong enough. He moved as a prefix to the original motion—"That this Congress considers the system of contracting by schedule, adopted by the Government as a means to the employment of cheap labour, and consequently the lowering of wages below the standard rates of wages of the district, is detrimental to the prime interests of the community; and also is of opinion that a clause should be inserted in all contracts prohibiting sub-letting and piece-work, and that no contract be accepted from any firm that does not pay the recognised rate of wages of the trade affected in the town or district where such work is being done; and further, the Congress pledges itself to oppose all candidates for Parliament, municipalities, or other local bodies, who do not pledge themselves to do all in their power to support the above resolution." He believed the Congress should lay down a policy for the Parliamentary Committee during the next twelve months, if they expected anything to be done.

The amendment was accepted by Mr. Shipton. Mr. Corbett proposed to further amend the resolution by adding after "municipalities" the words "and all contracts for the same."

Mr. Weighill supported the resolution.

Mr. John Burns expressed the opinion that Mr. Shipton's resolution went as far as the majority of trade unionists wished to go. It would improve matters slightly, but not to the extent that would justify the Congress in passing it in its present form. He exemplified his contention by saying that the London compositors were themselves protected entirely by the phrase "fair wages," which meant for the compositors trade union rates, but it did not mean so in those of bricklayers, stonemasons, and the like. In these trades there was much harm done by sub-letters and sub-contractors searching all over England for pace-workmen, whom they paid 1d. to 1½d. an hour above the ordinary wages, to keep up the pace which others were compelled to follow. He was against "fair wages," and in favour of trade union rates.

After a great deal more discussion, the resolution was temporarily withdrawn in order that it might be re-modelled so as to include cases which were not within its scope as originally drawn.

Subsequently Mr. Shipton read the resolution as re-drafted. It was as follows:—"That this Congress condemns the system of contract by schedule adopted by the Government and other public bodies, as it conduces to low wages, scamped work, and inferior materials, which are pernicious to the public interest. The Parliamentary Committee is hereby instructed to take such steps as may be most effective to secure the insertion of a

clause in all contracts prohibiting sub-letting; that no contract shall be given to any firm which does not pay all its workpeople at the recognised trade union rates of wages in the respective localities where any such work may be done, either by those directly employed by Government or municipalities or contractors having contracts from these bodies; also demands that where the factory clause is inserted and violated the penalty should be rigidly enforced."

A prolonged discussion followed, in the course of which several members protested against the re-modelling of the resolution, which, however, was ultimately carried almost unanimously.

*Factory Inspectors.*

Mr. Holme, in the absence of Mr. Birtwistle, moved—"That this Congress, whilst gratefully recognising the reform which has recently been effected by the appointment as factory inspectors of men having a practical acquaintance with the conditions of factory life, regrets that as yet no steps have been taken by her Majesty's Government to give effect to the repeated and pressing demands of previous Congresses for a considerable addition to the staff of factory inspectors." He contended that an increase of factory inspectors was urgently wanted. The factory laws were daily broken with impunity.

Mr. Lyons said he would second the motion if Mr. Holme would accept the word "technical"—he meant inspectors having a technical acquaintance with the conditions of factory life. The reason why the factory inspectors could not do their work properly was because they did not understand the trickery of the sweaters and the manufacturers. Something should be done to alter this state of things.

Mr. Holme declined to accept Mr. Lyons's suggestion. The motion was seconded by a delegate, after which Mr. Lyons moved, and Mr. Bradford seconded, the suggestion as an amendment. The latter speaker said the greatest hindrance to the work of the inspectors was their lack of technical knowledge of factories and of trades. He thought it might be suggested to the Government that they might do without the knowledge of Latin and Greek in regard to the appointment of factory inspectors, and impose upon them as a condition that they should have a thorough knowledge of the trades and industries which they were going to inspect.

Miss Whyte at some length urged the necessity for female inspectors being tried in regard to factories where women are employed.

Mr. Davies supported the resolution. For six and a-half years he was himself an inspector of factories, and he came to the conclusion that the district was altogether too large. For instance, he said another inspector had to work a district 100 miles long by forty broad, and containing from 10,000 to 14,000 factories and workshops, and which it was impossible for two inspectors to attend to efficiently. He had come to the conclusion that the Factory Acts were a fraud upon the best-regulated factories.

After some further discussion, the motion, with the suggested amendment, was agreed to.

*The Qualification of Enginemmen.*

Mr. J. Swift moved the following resolution:—"That this Congress regrets that no favourable opportunity presented itself during the past Session of Parliament to debate the Bill having for its object the future examination of persons in charge of steam engines or boilers, and the granting of certificates as to their practical fitness for such a duty. That the Parliamentary Committee be instructed to arrange for the re-introduction of this Bill next Session; and should any other Bill be introduced relating to steam engines or boilers, that an effort be made to have included the principle of examination and granting of certificates as to the practical fitness of all persons placed in charge of steam-engines or boilers." He said that for twelve or thirteen years a resolution had been adopted by the Congress in favour of the Bill making it compulsory that enginemmen and boiler attendants should possess certificates of competency. Some time ago a Bill approving this principle was introduced in the House of Commons by Mr. Fenwick, and was rejected, but Mr. Fenwick was informed that if the Bill had not been of such an extreme nature, it would have received greater support. A new Bill had since been prepared, and they believed it would

be acceptable to those who had opposed the former measure. He mentioned that in 1879 there were seventy-two boiler explosions, by which twenty-eight persons were killed. One striking feature of the returns was that not one single explosion took place on board steamers on which there were certified engineers. The insurance companies' returns showed that out of twenty-four cases of explosions, seven were attributable to pure negligence on the part of the attendants.

Mr. Whitburn seconded the motion. He considered that they should call on labour representatives in Parliament to demand that questions like this, involving the safety of human life, should be considered as questions of urgency. They did not want this Bill to create a monopoly, but simply to protect themselves as skilled workmen.

The motion was unanimously agreed to.

*The Employer and Workman Act.*

Mr. P. H. Holmes moved—"That it be an instruction to the Parliamentary Committee to endeavour to effect such a change in the Employer and Workman Act, 1875, as to cause section 11 to apply to male adults in the same manner as it does to female young persons and children." He urged that they should be put on a level with women and children, and that if they were unavoidably kept from their work, the wages which they had earned should not be retained. They claimed the same justice for themselves as their employers did. They had a perfect right to demand that the law of their country should give them perfect equality with those who employed them. They did not consider that their employers had any right to deduct money out of their wages.

Mr. Roy seconded.

Mr. Keir Hardie moved as an amendment that section 11 should be so extended as to include payments for materials necessary to the carrying on of the work and for the necessary conveniences for the workers. The reason for this proposal was that there were certain charges made, especially against women and young workers, which ought to be rendered illegal, and which the extension of the clause would make illegal. It was recently the law in a factory that each worker should pay a penny a week for the peg on which they hung their clothes whilst they were at work. To-day it was the rule in certain factories that girls were charged a penny a week for the rooms they occupied whilst at work. Others, again, were charged 25 to 50 per cent. above the cost price for the materials they used, and they were compelled to purchase their materials from their employers. Others, again, paid threepence a week for keeping their workroom clean, and they themselves had to perform the work, the money being to provide brushes and soap. In another case reported to him, on indisputable authority, a penny a week was charged for the lavatory accommodation of the workers.

Mr. Holmes accepted the amendment, and the resolution as amended was agreed to.

*Labour Disputes and Conciliation.*

Mr. Charles Hobson moved—"That this Congress is of opinion that the formation of joint boards, composed equally of employers and workmen, is highly desirable, as being well calculated to result in a better understanding between them, and the settlement of vexatious questions affecting the interests of both; and hereby urges the trades councils and other organised bodies of workmen to bring the subject before the chambers of commerce and other bodies of employers, with a view to the formation of such boards."

Mr. Stuart Uttley seconded. He said that whatever might be said to the contrary, the great bodies of working men were those who should take up this matter of conciliation.

Mr. Davies strongly held the opinion that to adopt conciliation boards was to turn the clock of trade unionism backwards. He moved, as an amendment, "That, whilst believing in the utility of conciliation boards in settling labour disputes, and many of the labour problems of the day, we are of opinion that the best parties to compose such boards are those directly interested in such matters, either the workmen or employers, as the interference of outsiders would be met with resentment." The disputes should not be left to persons and others, who know nothing about labour. Working men formed themselves into a strong union they could force up the price of labour simply by the force of trade unions.

Mr. Aston said that by binding themselves to

\* See p. 186, ante.



gether they would obtain their demands. Outside interference, he believed, caused resentment.

Mr. Wardley thought a third party should be called in before ill-feeling was engendered, and before there were great losses. He was strongly in favour of the resolution.

Mr. Bloor supported the resolution.

It was next moved and seconded that the question be now put. For the motion 123 hands were held up, and 59 against. The motion was declared carried.

The amendment was, on a vote, rejected by 126 to 70.

Mr. Paterson moved the omission of the last sentence of the resolution. He explained that in Durham the representatives of the employers and workmen had settled their disputes without the interference of the Chamber of Commerce, or other outside bodies.

Mr. Boyle seconded.

The mover of the resolution, Mr. Hobson, accepted the amendment, as it did not alter the principle.

The resolution, as amended, was carried.

#### Proposed Labour Exchanges.

Mr. Quelch (on the fourth day, September 4) moved the following resolution:—"That, in the opinion of this Congress, in order to carry out more efficiently the organisation of the large mass of unorganised labour, to bring into closer combination those sections of labour already organised, to provide means for communication and the interchange of information between all sections of industry, and the proper tabulation of statistics as to employment, &c., of advantage to the workman, it is necessary that a Labour Exchange, on the model of the Paris Bourse du Travail, should be provided and maintained by public funds in every industrial centre in the kingdom." There was not, he thought, a single delegate present who would deny the necessity for such an institution in every industrial centre, and the only points of difference likely to arise were as to the methods of acquiring and maintaining them. He contended that they should be the property of the municipality, established by public funds, and controlled by organised workmen for the benefit of organised workmen. There might have been a time when some objection could have been raised to this, but now, when they were using every effort to get the control of municipal and administrative bodies it seemed only right it should be one of the functions of these bodies to supply places of meeting where the general work of labour organisation might be carried out. He had a report of the Paris Bourse du Travail, and from that might be seen the great value of the Bourse to workmen. He hoped that some steps could be taken to secure the better organisation and complete emancipation of labour.

Mr. J. Walker seconded the motion, but it was at once shelved by the expedient of moving and carrying "the previous question."

#### The Eight Hours Question.

Mr. G. J. Marks moved "That, in the opinion of this Congress, the time has arrived when steps should be taken to reduce the working hours in all trades to eight per day, or a maximum of forty-eight hours per week; and, while recognising the power and influence of the trade organisations, it is of opinion that the speediest and best method to obtain this reduction for the workers generally is by Parliamentary enactment. This Congress, therefore, instructs the Parliamentary Committee to take immediate steps for the furtherance of this object."

This having been seconded,

Mr. Paterson moved, as an amendment:—"That, in the opinion of this Congress, it is of the utmost importance that an eight hours' day should be secured at once by such trades as may desire it, or for whom it may be made to apply without injuring the workmen employed in such trades; further, it considers that to delegate this important question to the Imperial Parliament, which is necessarily, from its position, antagonistic to the rights of labour, will only indefinitely delay this much-needed reform."

After a long and exciting discussion, the Congress voted on the amendment, when there were: For the amendment, 173, and against it, 81; majority against 8. The original resolution was subsequently put to the vote, when the figures were: For the resolution, 193, against it, 155; majority for, 38.

#### Workshop Accommodation.

Among the motions discussed on the fifth day (Friday, September 5) was the following, moved by Mr. Lewis Lyons:—"That it be an instruction to the next Parliamentary Committee to bring the following before the Government of the day:—Any person who desires to open a factory or workshop must give notice to the Chief Inspector of Factories, at the same time to furnish particulars of that branch of industry which is intended to be carried on, a plan of the construction and interior arrangements of the establishment, and of the number of workpeople to be employed." He stated that for men and women engaged, not only in his trade, but in many others, the cubic space allotted was not sufficient. Instead of having from 400 to 600 cubic feet of breathing-space, they had only 120 feet or 180 at the highest.

Mr. Hollings seconded.

Mr. Parnell moved the addition of the following words, "And that on receipt of notice from the person desirous of opening a factory or workshop, the chief inspector of factories shall, within six days from the receipt of such notice, cause the sanitary and technical inspector to visit such place, and see whether it was sufficiently lighted and had proper sanitary arrangements for workers of both sexes, and was properly ventilated in proportion to the number of persons to be employed therein; and in all cases there shall be not less than 600 cubic feet of space provided for each person employed."

Mr. Lyons said he would accept that addition.

Mr. King thought it was ridiculous to expect that a man could say before he started business how many workers he was going to employ. If he gave notice to the inspector the latter would see that the cubic space allotted was sufficient. He would, therefore, move that the words of the resolution after the words "carried on" should be omitted.

Mr. Davies seconded the amendment. It would, he said, be quite impossible for a man to intimate the number of people he intended to employ before opening a workshop.

Mr. Lyons accepted the amendment, and the resolution as amended was agreed to unanimously.

#### Election of Secretary to the Parliamentary Committee.

For this appointment, vacated by the retirement of Mr. Broadhurst, M.P., there were three candidates, viz., Mr. Fenwick, M.P., Mr. G. Shipton (Secretary of the London Trades' Council), and Mr. Threlfall. In the first balloting the voting was:—Fenwick, 171; Shipton, 147; and Threlfall, 76. As no one candidate had a majority over the other two, a second ballot was taken between the two highest, which resulted as follows:—Fenwick, 197; Shipton, 181; majority for Fenwick, 16.

This practically concluded the business of the Congress, although a number of resolutions were discussed at Saturday's meeting. On Saturday there was a great procession of trade unionists through the streets, those belonging to the building trades forming, according to the *Liverpool Post* (which has given very full reports of the Congress throughout), a very imposing part of the procession.

#### COMPETITION.

THE TAITE WELSH INTERMEDIATE SCHOOL COMPETITION.—The award in this competition was made known last week, and in the assessor's (Mr. Ewan Christian) report the names of the successful competitors were placed in the following order:—Messrs. Phillips & Holdgate, Cardiff and Newport; Messrs. Baker & Hughes, London; Mr. T. E. Prayce, London; and Mr. R. Grierson, Bangor. It is intended to publish the assessor's report.

THE PLYMOUTH MASONS' STRIKE.—The strike of masons at Plymouth, which has lasted seven weeks and stopped some important building operations, ended on Saturday, the 6th, in a compromise. The men, who made no demand with regard to wages or hours, required the total abolition of piecework, and that, with slight exceptions, no dressed stone should be brought into the town. The masters refusing these demands, nearly three hundred men struck, and the contest was continued on both sides with great obstinacy. However, on Saturday night, representatives of masters and men met, with the result that the dispute terminated, the masters undertaking to abolish piecework and the men forgoing the other demand.

#### THE SHEFFIELD WATERWORKS.\*

THE town of Sheffield is supplied with water by gravitation from the elevated moorlands lying to the west and north-west, the gathering-grounds forming part of the western slope of the backbone of England. The rainfall has been continuously gauged for the last fifty-four years, and averages rather more than 40 in. in depth per annum. Of this it has been ascertained from actual experience that during a period of three consecutive dry years nearly 20 in. can be collected, stored, and distributed.

The system of reservoirs may be divided into the high-level and the low-level, the distinction having reference, not to absolute height above the sea, but to the means available for conveying the water from the storage reservoirs into the various service reservoirs near the town.

**High-level Reservoirs.**—The high-level reservoirs are situated at Redmires, about six miles in a direct line from the centre of the town, these reservoirs being among the earliest of the large works constructed by the late Waterworks Co. They consist of three reservoirs—the Upper, Middle, and Lower Redmires—with the Oaken Clough Dam and Catch-water. They receive the flow from 2,108 acres of drainage area, and have a total storage capacity of 670 million gallons, the gathering-ground comprising the upper part of the valley of the River Rivelin. The water from the high-level reservoirs is conveyed down a water-course, open for the greater part of its length, but covered in at the lower end, into the Hadfield or Crookes service reservoir, having a capacity of more than 21 million gallons, whence the supply is taken for the higher parts of the town.

**Low-level Reservoirs.**—The low-level system comprises two reservoirs upon the River Rivelin, originally constructed for mill compensation purposes, in consideration of water taken from the high-level system. Under the Sheffield Waterworks Act of 1853 these Rivelin reservoirs reverted to the Waterworks Co., compensation to the stream being provided for by the flow, over a notch-gauge or weir, of 7 cubic feet per second during twenty-four hours of every working day. The other portion of the low-level supply is composed of four reservoirs in the adjoining valley of the River Loxley, these being the Strines, Dale-Dike, Agden, and Damflask reservoirs. There is also upon the River Rivelin, immediately above the mill-compensation gauge, a small reservoir called the depositing pond, constructed for the purpose of regulating the flow of water for the mill gauge. The total capacity of the low-level system of storage reservoirs is more than 3,000 million gallons, details of which are shown in the accompanying table, which also shows the area of water-shed draining down to each system of reservoirs. The water collected in the Strines, Dale-Dike, and Agden reservoirs is conveyed through a tunnel, passing under the high ridge which divides the Loxley from the Rivelin water-shed; and uniting at the depositing pond with the water from the Rivelin reservoirs, passes through a conduit and tunnel to the service reservoirs at Crookesmoor lying immediately west of the town.

#### Existing Reservoir Capacities and Areas of Gathering Grounds.

Reservoir.	Capacity.	Gathering Ground.
	Gallons.	Acres.
<b>HIGH-LEVEL.</b>		
Redmires Upper.....	343,000,000	—
Redmires Middle.....	187,500,000	—
Redmires Lower.....	139,500,000	—
Total of High-level.....	670,000,000	2,108
<b>LOW-LEVEL.</b>		
River Rivelin { Rivelin Upper.....	48,500,000	2,870
{ Rivelin Lower.....	175,000,000	
{ Depositing Pond.....	8,000,000	2,990
{ Agden.....	629,000,000	
River Loxley { Strines.....	513,000,000	
{ Dale Dike.....	488,000,000	
{ Damflask.....	1,155,000,000	3,747
Total of Low-level.....	3,017,500,000	13,685
Total of High-level and Low-level.....	3,687,500,000	15,793

In the valley of the River Ewden, lying immediately north of the Loxley valley, the Corporation of Sheffield have power to construct two

\* A paper by Mr. Edward M. Eaton, Engineer, read at the Sheffield meeting of the Institution of Mechanical Engineers, on Wednesday, July 30.



other reservoirs, namely, the Broomhead and Moorhall reservoirs, for receiving the flow from a drainage area of 6,496 acres; but these works have not yet been commenced.

**Summary of Supply.**—The total drainage area of the works is 15,703 acres. The total available water during three consecutive dry years is 19,460,000 gallons per day of which an average of 9,113,472 gallons per day has to be sent down the streams as compensation water, leaving 10,346,528 gallons per day for the supply of the town and district. It will thus be seen that nearly one-half of the available supply of water has to be sent down the rivers for the benefit of the mill-owners and other riparian proprietors.

**Redmires Middle Reservoir.**—In order of date the first storage reservoir constructed was the middle reservoir at Redmires. This reservoir has an embankment 1,012 yards in length, the greatest depth of water being 36 ft.; and it is provided with two overflow weirs or by-washes, respectively 70 ft. and 104 ft. in length. Water is drawn off by means of valves placed in a masonry shaft and discharging into the lower reservoir, the valve-shaft being connected with the bank by a wooden bridge constructed in 1834. This bridge is now much decayed, and is on the point of being replaced by a bridge made of iron.

**Redmires Lower Reservoir.**—The next reservoir in point of age is Redmires Lower, constructed in 1847. The depth of water is 23 ft., and the length of the bank is 590 yards. Here both the water for supply and the flood-water are conveyed through a valve and overflow-shaft into a culvert passing through the bank, means being provided on the outer slope of the bank for passing surplus or flood-water into the Wyming brook and River Rivelin; while the water required for the town is taken into a gauge basin, measured through a notch, and sent down the watercourse into the high-level service reservoir.

**Redmires Upper Reservoir.**—The Redmires Upper reservoir, constructed in 1853-4, receives the water from its own gathering-ground, and also, by means of a catch-water drain, the additional yield of the Oakton Clough drainage area. This reservoir has a bank, 786 yards in length, the water being drawn off by means of two lines of pipes, 14 in. in diameter, laid through the bank, terminating at their inner end in a vertical cast-iron valve-tower or shaft.

These three Redmires reservoirs may be taken as types of the old practice of reservoir construction in this country. The predominant features are banks of earthwork with a puddle wall in the centre, the depth of water rarely exceeding 40 ft.; and the absence or insignificance of masonry or brickwork.

**Rivelin Reservoirs.**—The same general features distinguish the next two reservoirs to be described, namely the Upper and Lower Rivelin reservoirs. These two reservoirs were constructed under the Sheffield Act of 1845, to be vested in the mill-owners, who had full control over them, and power to draw off water from them as they thought fit. They were of a capacity agreed upon between the Waterworks Co. and the mill-owners; and having a gathering-ground far in excess of their storage capacity, a by-pass channel or river diversion was constructed, by means of which excessive floods were prevented from entering the reservoirs, or when these were full the whole flood from the drainage area was diverted past them. Each reservoir is provided with an overflow weir or by-wash, and water is drawn from them by means of a pipe 24 in. in diameter.

These five reservoirs, namely the three at Redmires and the two on the Rivelin, were designed and constructed by the late Mr. John Towler Leather, who from 1830 to 1865 was the engineering adviser of the late Water Works Co. Since the latter date the engineers responsible for the large and important reservoirs upon the Loxley have been Messrs. T. & C. Hawksley.

**Depositing Pond.**—In the Rivelin valley the depositing pond, also constructed by Messrs. Hawksley, is principally remarkable for its fine overflow weir and by-wash, capable of conveying away the heavy floods which are occasionally discharged from the area of nearly 5,000 acres draining down to this point.

**Agden Reservoir.**—In the Loxley water-shed, the first reservoir constructed was that upon the Agden Dike, having a storage capacity of 629 million gallons, the embankment being nearly 100 ft. high and containing 900,000 cubic yards of material. The water is drawn off

from the reservoir by means of a valve-shaft and a culvert laid through the bank, controlled by two valves which are worked by gearing upon the top of the shaft. From the outlet culvert the water discharges into a gauge basin, where provision is made by means of a slot gauge or orifice for passing a measured quantity of compensation water down the stream. The measuring opening or slot is made capable of accurate adjustment by sliding jaws of steel, which when adjusted are locked by two padlocks; the key of one is in the hands of the clerk to the mill-owners, while that of the other is kept at the Waterworks office; it therefore requires the consent and presence of both parties to make any alteration in the measuring apparatus. The same description of slot gauge is in operation at each of the four reservoirs upon the Loxley.

**Strines Reservoir.**—The Strines reservoir at the head of Bradford Dale has a bank 418 yards in length, the water being drawn off by means of a shaft and a culvert through the bank. This embankment, in common with those of the other Loxley reservoirs, has an inside slope of 3 to 1; the outer slope is  $2\frac{1}{2}$  to 1, and is strengthened by level benchings.

**Dale Dike Reservoir.**—Immediately below the Strines reservoir is the Dale Dike reservoir, upon the site of, but considerably smaller than, the ill-fated reservoir which was destroyed by the disastrous inundation on March 11, 1864. The embankment which was then destroyed crossed the valley obliquely, about a quarter of a mile below the present bank; and before the reservoir was a settlement in the outer slope of the embankment, causing the puddle wall to subside and the water to flow over the top of the bank. In a few minutes the reservoir was destroyed, and the valley down to Sheffield was inundated, causing the death of 244 persons, and the destruction of an enormous amount of property. The Water Company paid no less a sum than 373,000*l.* in respect of injury and loss sustained, the disaster being happily unique so far as regards this country.

The embankment for the new reservoir was made higher up the valley, in order to avoid the treacherous ground upon which the old bank stood; but it may be interesting to state that the pipes which ran under the old bank, and which were alleged to have caused the disaster, are still in the ground, and are as tight and strong as the day they were laid. The water is drawn out of the present reservoir by means of a tunnel driven through the solid rock round the end of the embankment; two valves are provided, one behind the other, and the gearing for working them is placed in a small house near the overflow weir; the outlet from the tunnel is in a line with the foot of the by-wash. This reservoir was completed and filled with water in 1875, but was not found necessary to be brought into use until the exceptionally dry year 1887.

Rather more than a mile below this reservoir, and at the junction of the Dale Dike with the Agden Dike at Low Bradfield, is the mill-compensation gauge, over which is passed for the use of the mill-owners a quantity of water equal to 10 cubic feet per second during twenty-four hours of every working day. In a small house alongside this gauge there is a recording-machine, designed by the writer for the purpose of continuously measuring the water flowing over the gauge-bar.

**Damflash Reservoir.**—Immediately below this mill gauge is the tail end of the largest, and in some respects most important, reservoir belonging to this undertaking, the Damflash reservoir, which is the lowest upon the river Loxley, and has a storage capacity of 1,158 million gallons, with a depth of water of 85 ft. The water is drawn off by means of two culverts through the bank, each provided with a valve-shaft on the inner end. Having regard to the great size of the reservoir, the embankment is not large; but the works in connexion with it are enormously heavy and costly. When the reservoir is filled with water up to a certain height it has been ascertained that a band of rock upon the south side allows the water to pass through the joints and fissures, to reappear as a spring at the bottom of the embankment. It was foreseen that this might prove to be the case, but, as it was uncertain what the quantity of water passing might be, it was considered better to defer remedial measures until the reservoir was filled and proved. To stop this percolation a wing trench is being cut through the pervious rock into the underlying shale, which will be

filled with puddle, so as to stop the water from passing away. At the foot of the embankment is placed the mill-compensation gauge, which has three slots or openings similar to the already described, while in a little house adjoining is another recording gauge, similar to that at Low Bradfield.

**Distribution.**—After leaving the storage reservoirs and being received into service reservoirs at Crookesmoor, the water is distributed throughout the town and district of supply by means of main pipes from 24 in. to 5 in. in diameter, laid in zones. The service-pipes are mainly 4 in. in diameter, 3-in. pipes being laid in short streets and courts. The total length of the distributing-pipes is nearly 300 miles. The total daily quantity of water distributed is about 6½ million gallons, of which exactly one-third is for trade and manufacturing purposes, or for supplies in bulk to local authorities distributing water themselves.

When water was first supplied to Sheffield under constant pressure in 1869, the daily consumption was 40 gallons per head of the population supplied, of which only about 2½ gallons per head was for trade purposes. Now, and many years past, the quantity consumed without restriction or limitation, for all purposes other than meter supplies, has averaged more than about 13 gallons per head per day. This happy result is due to the rigorous regulation, so far as practicable, of fittings and apparatus of an inferior character, combined with unceasing vigilance in suppressing the unnecessary waste of water.

**Self-Recording Gauge.**—At each of the service reservoirs a self-recording gauge, similar in construction to those at Low Bradfield and Damflash reservoirs, is fixed for the purpose of measuring the water supplied to the town. These recorders have been in use since 1869, and the result of their working has been to disclose several facts relating to the supply of water, of a character very interesting to be engaged in the practical management of water works. So far as Sheffield is concerned, the least draught upon the reservoirs is between three and four o'clock in the morning, the maximum draught being between eleven and twelve noon; while the fact of the stoppage of work for dinner between twelve and one o'clock is strikingly manifested. Our experience indicates that in proportioning pipes for town supply, although the average daily flow through the pipes may be taken at 100, provision must be made for passing 50 per cent in excess of this quantity.

In connexion with the system of pipes for water-supply, it may be interesting to compare the two specimens of pipe exhibited, each of 5 in. inside diameter. One of these is a modern cast-iron pipe, as now laid in the streets of Sheffield; the other is a wooden pipe formerly used, which was taken out of the ground during May last, after having probably lain there nearly if not quite a century. The wooden pipes were made upon the Waterworks premises, and the last of them was about sixty to seventy years ago.

**Quality of Water.**—The water supplied to Sheffield may be taken as a fair type of the excessively soft upland waters supplied to many of the large towns in the North of England. The hardness varies at different periods of the year, rarely falling below two degrees of Clarke's scale, and seldom exceeding three degrees. The extreme energy displayed by these soft waters in attacking metals exposed to their action is well shown by the specimens now exhibited of wrought-iron screw-nuts, bolts, and washers. These have been wholly immersed in the water to a considerable depth for a period of more than forty years, and the manner in which the pure metal has been eaten away is most remarkable. It has been found also that steel blades, such as razors, pocket-knives, and table-knives, and also suffer complete deterioration to a considerable depth from the surface of the metal when immersed in the water for several years. It has been proved by the recovery from time to time from the reservoirs of bundles of steel articles, which had doubtless been placed there in connexion with trade outrages in the past. The steel was found to have been converted into plumbago, whole bundles of blades being capable of being scraped with a penknife. This fact should in the opinion of the use of cast steel, when water is continuously immersed in water of character.

The Corporation of Sheffield supply water



more than 320,000 persons. The revenue from the rates is 90,000*l.* per annum. The capital cost of the undertaking, as shown by the accounts to March 25, 1890, has been upwards of 2,115,000*l.*

## Correspondence.

To the Editor of THE BUILDER.

### SALARIES OF CLERKS OF WORKS.

SIR,—I notice in your issue of the 30th ult. a letter from Mr. Dalton concerning clerks of works, affected by the ludicrously low salary offered in the case of the Amerham job.

With much of Mr. Dalton's letter I perfectly agree, but I must protest against the assumption that men are to be found who, while capable of performing the duties of a clerk of works, are yet so miserably devoid in honesty of purpose as to be guilty of accepting an appointment at a miserably low salary rather than be out of a job, and then to commiserate themselves at the earliest opportunity by turning the interests of their employers. Such admission is tantamount to an endorsement of all vile trash that has lately been so lavishly bandied out concerning clerks of works in general. I maintain that if a man is capable of dishonesty he is not fit to be entrusted with the duties of a clerk of works, and it is not his duty to prevent him from indulging in wicked propensities even when in receipt of a small remuneration.

SIR, a clerk of works worthy the name is not man to take up a job under such beggarly circumstances. The person who is the most likely to do it,—aye, and to be accepted, is the young upstart pretender with plenty of assurance, and sufficient smattering of building construction materials as to enable him to answer satisfactorily a few theoretical questions if put to him for the purpose of testing his competency. It is from appointment of such as these that disaster and discredit are certain to follow, with the equal certainty of the odium and disgrace attached to it. I cast upon the shoulders of the *bona-fide* Clerks of Works who have acquired their proficiency out of lifetime of practical experience, through all the ups and downs of a journeyman upwards.

J. WOODLEY.

### SQUARE TURNING.

SIR,—Will any of your readers give me the name of a firm who turns square wooden pillars? I am obliged by your insertion of this query.

E. F. BEHRENS.

## The Student's Column.

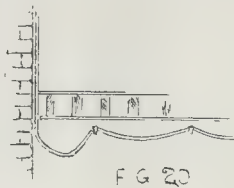
### HOT-WATER SUPPLY.—XI.

PIPES AND COCKS: *continued.*

IT must have been noticed by nearly everyone that when a plug-cock is closed at all sharply, where a tolerable measure of water exists, that a somewhat noisy noise is heard in the pipe, and the pipe sometimes shaken. It is when this noise is heard that the strain is exerted which injures the metal pipes.

It has to be remembered that water is not an incompressible substance, and in respect resembles a solid body, so that when we suddenly stop a stream of water flowing under a high pressure within a confined area considerable resistance must be expected, and it exerts itself chiefly in the vicinity of the cock where the greatest pressure is felt. Shutting up 50 ft. below the cold-water cistern causes a pressure of about 21 lbs. to be brought to bear on every square inch of pipe surface near the cock in question; if the tap is closed slowly the strain is reduced to a minimum, but if closed sharply the strain assumes the character of a blow. The tap—used to be referred to over these times as a "tap"—is to some extent, as tin is of a more rigid nature than lead, and, of course, not so much so as iron. The different strains brought to bear in this case have not only the effect of bulging and weakening lead pipe, but also an even worse effect in causing the pipe to be stretched and twisted, which ill effect is of greater consequence than the bulging. An instance of this recently came under notice (in London) in which lead pipe of a very fair weight had been used, but which proved to be a very marked case, owing partly to insufficient hooking up, and partly to a considerable length being hooked up to a high, straight casing in which it was difficult to give it good support. The fact was that the horizontal pipe sagged down between the hooks, and the vertical pipe was lengthened several inches by its own

weight and the pressure of water within it, so that in a few months it was exactly as fig. 20. In this instance the contractors were com-



pelled to renew the whole apparatus in iron at their own expense.

When the flow and return services are lead pipe it is generally necessary to have the ends nearest the boiler of iron, the former material being fusible at a moderately high temperature, and fusing is likely to occur if the pipes are furrowed or if the boiler is emptied (by a workman) immediately after the fire is extinguished and before the surrounding metal and brick-work have lost any of their heat.

An important point which, up to the present, has only been just touched upon, is the size of pipes most suitable for different services and purposes. This, like many other matters connected with hot-water supply, is greatly regulated by the flow difficulty, which makes it necessary to use much larger pipes than are needed in soft-water districts. There is a definite limit as to the size of pipes; and although comparatively large pipes are always recommended for the two reasons about to be explained, yet to increase the pipes beyond a certain point is most disadvantageous.

A large pipe is considered to be conducive to a freer circulation,—that is, the water can travel from boiler to tank at a greater speed on account of the lessened friction, and it is certainly beneficial for the water to leave the boiler as fast as possible when it has absorbed heat; but this advantage alone would not be generally considered of sufficient importance to warrant the great cost of larger pipes and the increased labour in fixing them. The reason which sanctions the greater outlay will be found, in nearly every case, to be the wish to lengthen the time in which pipes become furrowed up and require renewal.

One-inch pipe is very largely used for the main flow and return services, and it is a size that will give excellent results so long as the passage within it remains an inch, and even when the incrustated deposit has reduced the bore to  $\frac{3}{4}$  in. there is very little to complain of (unless the apparatus is on an extensive scale);  $\frac{1}{2}$  in. may, therefore, be considered a suitable size in soft-water districts for general domestic work; but if the apparatus is of a large size, in a hotel or institution,  $\frac{1}{2}$  in. and in some instances  $\frac{3}{4}$  in. should be recommended.

In hard water districts,  $\frac{1}{2}$  in. is best for ordinary residence work, but if, in a tank system, the flow and return pipes are of considerable length, an economy may be permitted by reducing the size to 1 in., say 30 ft. from the boiler, as the incrustation will be found in almost every instance to be much less at the tank end of a long pipe than near the boiler. In a cylinder apparatus, unless very small, the short flow and return from cylinder to boiler should always be  $\frac{1}{2}$  in.; all other pipes in this system may be smaller.

In the tank system the expansion-pipe and cold supply for moderate sized work may both be  $\frac{3}{4}$  in., but for a good sized residence, where a fair demand for hot water exists, the supply-pipe should be 1 in., and the expansion should be increased to 1 in. also. The sizes of the draw-off services should be, 1 in. pipe for baths,  $\frac{3}{4}$  in. for scullery, pantry, housemaids' sinks and general purposes,  $\frac{1}{2}$  in. for lavatory basins and any small purpose; these sizes, for draw-off services, are usually adopted in both small and large works on any system.

In the cylinder apparatus the primary flow and return should be  $\frac{1}{2}$  in., as mentioned; the rising main or secondary flow may be  $\frac{3}{4}$  in. in small property, but never less than 1 in. in work of a fair size; if this pipe is returned (forming a secondary return) this may be  $\frac{1}{2}$  in. or  $\frac{3}{4}$  in. according to the magnitude of the installation, and the cold supply should be either  $\frac{3}{4}$  in. or 1 in. (with a full way stop-cock), also according to the importance of the work in hand. The great objection to a small cold supply service is

that it reduces, *i.e.*, checks the flow of water from the taps of the apparatus.

When a pipe becomes furrowed, the bore becomes reduced in size, and would, if permitted, eventually become quite stopped, ending in an explosion at the boiler; but an explosion from this cause has most probably never occurred, as, before any real danger exists, such violent noises and vibrations are noticed that an experienced man is called in, owing to the apprehension of danger that arises. It is generally when the bore has been reduced to about  $\frac{3}{4}$  in. (depending, however, upon the power of the boiler) that the noises are first heard, and which are caused wholly by the steam being unable to escape freely; usually the flow-pipe gets the greatest share of the fur, in which case the violence arises by some proportion of the steam forcing itself into the return pipe.

A 1 $\frac{1}{2}$ -in. pipe will last nearly double the time a 1-in. pipe will before giving trouble, as, in the first place, a  $\frac{3}{4}$ -in. deposit is longer in accumulating on a 1 $\frac{1}{2}$ -in. than on a 1-in. surface, and when the former has a  $\frac{3}{4}$ -in. deposit it is still fit for a great deal of service; whereas the latter is upon the point of giving trouble. It should be mentioned that it is commonly the case for the supply of hot water to become lessened and somewhat uncertain when pipes are badly furrowed, commencing before the noises are heard.

It is quite possible to have the pipes cleaned of fur when the occasion arises, but this necessitates their removal, and a somewhat lengthy job afterwards in heating and hammering them, and it will be found as cheap and decidedly better to replace them with new.

## OBITUARY.

MR. JOHN BELCHER.—We record with much regret the death, at the age of 73, of Mr. John Belcher, F.R.S.E., formerly of 5, Adelaide-place, E.C. Mr. Belcher, who retired from practice in 1870, was well known in the City as an architect of varied and considerable attainments. He erected many important buildings in the City of London, as well as numerous mansions and country houses throughout the country. His son, Mr. John Belcher (now of 20, Hanover-square, W.), after a short partnership with his father, succeeded to his practice.

MR. THOMAS JACKSON.—The death is announced of Mr. Thomas Jackson, architect, Belfast, at the age of 83. He commenced to practise in Belfast nearly sixty years ago, having been articled to late Mr. George Dymond. The *Belfast Newsletter* gives a long list of his works, which are to be found not only in Belfast, but all over Ireland.

## GENERAL BUILDING NEWS.

THE NEW FRUIT AND VEGETABLE MARKET.—The *City Press* says that the contractors who are engaged on the erection of the new fruit and vegetable market have already made considerable progress with their work. The market, which is to take the place of the old market in Farringdon-street, is being built at the corner of Charterhouse-street and Farringdon-road. At present the efforts of Messrs. Rudd & Son, the contractors, are centred upon the substructure of the building, which has been designed by the City Architect, and will be carried out under the auspices of the Markets Committee of the Corporation. The first thing, of course, is to clear the site, and this part of the operations has been entrusted to Mr. Nathaniel Fortescue, who, with the aid of a number of excavators and three steam cranes, is removing the debris at the rate of about 300 loads a day. It is carted down to Blackfriars Bridge, where Mr. Fortescue has a "shoot," and is then sent away in barges, to be used in the filling-up of a vacant space at Dagenham. Nearly thirty carts are all day long going backward and forward between Farringdon-road and the bridge. Several weeks will elapse before the site is in full possession of the contractors for the sub-structure. The basement will be used by the Great Northern Railway Company, by arrangement with the Corporation, and the rails will be carried underneath Charterhouse-street to the Central Provision Markets, where the Railway Company will have a general goods depot, with, of course, access from above. Steel columns will be used, and these will rest upon a foundation of concrete and blue Staffordshire bricks. On the tops of the columns, massive girders, also of steel, will rest, and the interstices will be filled in with brick arches and concrete. The Provision Markets facing the site will have to be shored up, so as to allow the putting in of columns, &c., in new positions, and allow the railway to be carried through. There will, in fact, be a reconstruction of the market basement. It may be added that on the north side of the market there will be somewhat similar works carried out by the Great Northern Railway, and that on the street level there will be erected warehouses by the company.



**PROPOSED NEW TOWN HALL FOR NEWCASTLE.**—A special meeting of the Town Hall and Municipal Offices Committee of the Newcastle Corporation was held on Monday. It was unanimously agreed that the City Engineer (Mr. Laws) should prepare tracings to show the street improvements deemed necessary in connexion with the four Town Hall sites, namely, Fenkle-street, Eldon-square, Singleton House, and a new site that was suggested by Mr. Edward Stout, including the whole of the ground on the east side of Pilgrim-street, bordered on the north by Blackett-street, and as far back as Carlisle-street, showing a new street line in continuation of Market-street to a point at the top of Trafalgar-street, opposite the entrance to the Blyth and Tyne Railway Station. It was also agreed that Mr. Laws should prepare at the same time a plan showing a new street line from Grey-street to the Haymarket, skirting the proposed new Town Hall, should it be eventually decided by the Council to erect one in Eldon-square.

**NEW METHODIST FREE CHURCH, GRAVELLY HILL.**—The United Methodist Free Church lately erected at Gravelly Hill, Birmingham, in memory of the late Alderman M. J. Har, was opened on Tuesday last. The church stands at the junction of Tanworth and Lichfield roads, and accommodates nearly 500 people. The pulpit has been carved in pitch-pine and mahogany by Messrs. Jones & Willis, from the designs of Messrs. Ingall & Son, architects of the church. The total cost of the church is over 4,000l.

**THE QUEEN'S HOTEL, CARDIFF.**—According to the *Western Mail*, the directors of the Queen's Hotel Company, Cardiff, have decided to rebuild the existing hotel. The building will consist of five floors exclusive of the basement, and will be five windows in length. The structure will be in the Renaissance style, and will be faced with red bricks, with terra-cotta ornamentation. The main entrance will be in the centre of the building, but there will be another one at the southern corner. The windows of the upper stories will be circular projecting bays on both the extreme ends of the building, working right up two floors, and finished in ornamental mansards. The total cost of the work is estimated at between 12,000l. and 14,000l. The new building has been designed by Mr. J. P. Jones of Cardiff.

**THE ULSTER BANK, DUBLIN.**—A branch office for the Ulster Bank, Dublin, which occupies a site immediately opposite the Houses of Parliament, is rapidly approaching completion. The front of the new building has been constructed of Ballinasloe limestone. The frontage is only 42 ft., but the height of the building is nearly 100 ft. The entrance is approached by a flight of steps leading to a porch. Ample accommodation is being provided in the interior. The central apartment has a vaulted roof, and at the end furthest from the entrance is a circular apse. Care has been taken to ensure sufficient light in all the offices. It is contemplated to light the bank by the electric light. The building will cost something like 20,000l. Messrs. Samuel Bolton & Sons are the contractors, and the carving is the work of Mr. Emery. The architect is Mr. Thomas Drew of Leinster-street, Dublin.

**NEW WESLEYAN CHAPEL, WREXHAM.**—The Mayor and Corporation of Wrexham attended in state the opening of a new Wesleyan Chapel at Wrexham, on the 6th inst. The new building is of stone, and has been constructed by Mr. Gethin, of Shrewsbury, from plans prepared by Messrs. Wadlington & Son, of Burnley, and has cost over 6,000l. A tower with a spire has been built at the east corner of the front of the chapel. The seating capacity is 650, and a large school adjoining will find accommodation for 330.

**ST. HUGH'S R.C. CHURCH, LINCOLN.**—Mr. Albert Vicars, of London, is the architect for this new church.

**SCHOOLS, NEWPORT, MON.**—Some two years back the United District School Board of Newport advertised for designs for schools at the Spring-gardens site, to accommodate 1,000 children in three departments, and many of the local architects submitted plans for the same. The Board, after selecting two sets of drawings as most suiting their requirements, marked these drawings "A" and "B," and forwarded both sets to Mr. Bruce Vaughan, architect, of Cardiff. The adjudication, which advised the acceptance of plans marked "B," the author of these being E. A. Lansdowne, of Newport, and the schools have now been carried out under his supervision by Mr. William Price, builder, of Newport, for a sum of 49,055. 16s. 7d. The fireproof flooring has been executed by Messrs. Homan & Rogers, Manchester. The lavine and lavatory arrangements are by Messrs. Adams & Co., and Mr. Henry Richards, of Newport, acted as clerk of works.

**THE ASSOCIATION OF PUBLIC SANITARY INSPECTORS OF GREAT BRITAIN** will visit the Orematorium at Woking, Surrey, on Saturday, September 27. Mr. J. C. Swinburn, Hamburn, Barrister-at-Law, Hon. Secretary of the Cremation Society of England, will give an address on "Cremation" early in the ensuing Session.

## FOREIGN AND COLONIAL.

**PRAGUE.**—As our readers have seen in the daily papers, owing to the flooding of the waters, the "Karls Brücke," the oldest and most celebrated of the seven bridges which cross the River Moldau within the precincts of the town, has been partially destroyed, three of the seventeen arches having broken down, carrying with them the upper portions of their respective piers and the interesting sculpture borne by the latter. The celebrated structure, the foundations of which were commenced 1357, may be considered as having been the most interesting historical curiosity in the city, and that it has now been so severely damaged is owing mainly to the apparent carelessness of the municipal authorities, who never troubled themselves about its state of repair, and, at the same time, permitted the weakening of the bridge by the laying of gas and water-pipes, the construction of a tram line, and the transit of heavy cars. Among the many structural accidents which have been caused by the late floods we may note the appearance of some dangerous cracks in the embankment walls. Traffic has been prohibited on the whole length of the wall.

**BRUNSWICK.**—The annual meeting of the German Public Health Association will be held here next week. Among the many lectures those on "Hospitals for minor towns and rural districts," "Filters in water mains," and "Workmen's homes," promise to be of special interest.

**DRESDEN.**—The so-called "International" Exhibition of Water-colours and Drawings, for which room has been found in the halls and class-rooms of the "Saxon Technical College," in spite of a catalogue in which the figures go up to 2,500, is but a poor concern, the hanging committee having apparently laid more stress on "quantity" than "quality" when selecting the exhibits. There is some interest in the large collection of original sketches published in the better-class comic papers of the empire. Many of the works introduce architectural subjects, in which the ignorance of the rudiments of architectural forms is somewhat startling. The far-famed collection of the "Grüne Gewölbe" of the old "Schloss" will be closed to the public for some time hence, a restoration and extension of the two wings having been taken in hand, which, when complete, will show some interesting "German Renaissance" work.

**FRANCE.**—The Minister of Fine Art is to inaugurate, on the 28th, the monument raised at St. André to Herlioz. —M. Yves Guyot, the Minister of Public Works, is to proceed to Lyons shortly, to inaugurate the new Pont Lafayette, and M. de Freycinet, the War Minister, is also to lay in the same city the first stone of the Ecole de Médecine Militaire. —The inhabitants of Eyguieres, are about to raise a monument to their citizen Jules Roche, mining engineer, who took part in the expedition of Colonel Flatters in 1881, and was killed abroad. —The Council-General of the Seine-et-Oise have made a concession to the Société Decauville for the establishment of a line of narrow-gauge railway between Versailles and Epoué. The company has applied for a concession for a line of 150 kilometres between Magy-en-Vexin and Villeneuve-St. Georges. This line, which would traverse the districts of Mantes, Paris, Etampes and Corbeil, would render great service to a populous neighbourhood. —M. Alphonse has been appointed Curator of the Champ-de-Mars Palace. —At Treguier a grand monument to St. Yves, the patron saint of Brittany, has been inaugurated with much ceremony and public festivities. —M. Artigues, the engineer, residing in Paris, has purchased for 600,000 francs the historic chateau of Hautefort, near Périgueux, once the property of the family of Damas d'Hautefort. —It is hoped that the new Museum at Leão will be opened in the spring. It is to be situated in the old Lyceé buildings. —A fine marble group, "Jeune Mère," by M. Hector Lemaire, has been presented by Baron Alphonse de Rothschild to the Museum of Dieppe. —The recent cyclone which has done so much damage in various parts of France has among other things seriously injured the chapel of Dreux, which contains the tombs of the Orléans family. The fine windows executed after the designs of Ingres have suffered much, and some of the sculptures of the facade have been seriously injured (apparently broken by the force of the wind). —At Annecy-le-Vieux the mould or matrix has just been completed for the great bell called "La Savoyarde," for the Church of the Sacré Cœur at Montmartre. The design includes a great deal of ornament of a Romanesque type, and several of the sculptures. The casting in bronze will not, however, be proceeded with till towards the close of the year.

**NEWTON HEATH BREWERY.**—The contract for the Newton Heath Brewery, loose boxes and infirmary, has been let to Mr. James Bryon, builder and contractor, of Bury, his total estimate being 2,517l. The architects for the work are Messrs. Maxwell & Tuke, of Manchester.

## MISCELLANEOUS.

**PROPOSED "HANOVER EXHIBITION."**—The San Exhibition of last year at the New Gallery is to be followed next January by an exhibition of pictorial objects of interest connected with the Hof of Hanover, which will include not only portraits of the Royal Family, but also those of the most famous statesmen, lawyers, divines, commanders, naval and military, and the representatives of literature, and science. The Committee are so confident that it will be possible to bring together of the most remarkable and instructive series of portraits of public characters ever displayed, that the artistic success of the Exhibition will be assured by the presence of the works of such artists as Reynolds, Gainsborough, Romney, Kneller, Thornhill, Raeburn, Flaxman, Lawrence, Cosway, Wedgwood, &c. The Committee have every ground for this confidence, if their request for loans adequately responded to. In an artistic sense, the Exhibition ought to have a success even beyond that of the Stuart Exhibition.

**FROST-RESISTING CEMENT MORTARS.**—Herr Bernhofer has recently been making some experiments with a view to testing the influence of frost on the quick-setting properties of cement mortars, the results of which he has communicated to German publication. It is well known that Portland cement or saturated solution of a certain Portland cement to not only on an extremely hard, and Herr Bernhofer made mortar consisting respectively of 1 litre (about 1 1/2 pints) of Portland cement and 1 litre of lime, each of it being mixed with 3 litres of river sand and a solution formed of 1 kilogram (about 2 1/2 lbs.) of crystalline soda and 2 litres of water. These mortars were exposed to the action of the frost for four hours and a half, the temperature ranging between 15 and 31 1/2 below zero. The specimens were placed in a hot oven for three hours. The experiments were entirely satisfactory, as the frost which the mortars had been exposed had produced no injurious effects in the specimens. Further experiments are to see whether the mortars retain their hardness, and also whether the quantity of soda used can be reduced. The Portland cement thus treated is put down as costing 84 cubic yard, whilst the lime mortar is stated to cost 11. 6s. 6d. per cubic yard.

**THE NORTH YORKSHIRE AND LANCASHIRE RAILWAY.**—There is every prospect of rail communication being shortly established direct from Lancashire to the north-east coast of England. The North Yorkshire and Lancashire Railway, which was intended to accomplish this, was projected some eight years ago, but was abandoned, owing to opposition to the scheme. The Lancashire and Yorkshire Railway, however, hesitating themselves in the matter, several public meetings have declared in favour of a revival of the project, and we believe that Messrs. Martin and Fenwick, of Park-place, Leeds, were the engineers for the original scheme, have been instructed to prepare plans for an application to the Government for a Bill to be introduced that the new line should commence at Holbeck, junction with the Midland and Lancashire Yorkshire Railways there, and proceed in a northerly direction, by Crasoe, Linton, and Gilling, to Kettlewell; thence by a tunnel in Wharfedale, down Coverdale and Middleham, Spennithorne, and then, passing under the Bolton and Leyburn Railway, will run direct to Darlington. —*Leeds Mercury.*

**UPPER NORWICH ATHENÆUM: VISIT TO THE FIELD HOUSE.**—Among the many educational signs of the times, not the least is the establishment of a number of local societies having for their object antiquarian, historical or archaeological pursuits; and among these societies the Upper Norwich Athenæum, which was established in 1877, has lately been making rapid strides. It now numbers about 100 members, and on Saturday afternoon last sixty gentlemen (members and friends) paid a visit by permission of the Marquis of Salisbury to Hatfield House, under the escort of Mr. Miss Pope, the honorary secretary. On arriving at a house a descriptive paper was read thereon Mr. Pope. As Hatfield was visited by the Architectural Association in 1888, when a very exhaustive and interesting paper was read by Mr. J. A. G. we must refer our readers to the *Builder* of September the year, and to the following pages, when an illustration of Hatfield House was published by us.

**THE ENGLISH IRON TRADE.**—The slight depression noticeable in the English iron market last week has passed off. There is a decidedly better feeling in prices are firm, and expectations are of a further recovery in stock. The pig-iron market recovered from its late reaction. Scotch pig-warrants have been steadier, and makers are. Middlesbrough pig-iron is 6d. a ton dearer. Mr. of Bessemer iron in the north-west hold firm their quotation of 58s. 6d., although home warrants are quoted 56s. 6d. Finished iron has continued animation, with an upward tendency in the healthy state in the steel trade. Enquiries are coming forward for new ships, engineers are also booking more work than late Iron.







Hancock & Son, Plumstead, at 1s. 10d. † per sup. yard.  
Woodham & Fry, Greenwich, at 1s. 9½d. per sup. yard.  
or 13 roads. † Accepted for ½ road.



F. & T. Boul.....	£400	S	0
Robert Holmes .....	382	0	0
Dearden & Jackson, 46, Rutland- street, Sheffield (accepted) .....	313	14	0

**SOUTHEA.**—For additions and repairs in Gloucester House, Victoria-road South, Southea. Mr. Wm. Yearley, architect, Gosport. — £140 0 0  
J. Crockerell, Landport (accepted).

**STANNINGTON.**—For the construction of an 18-in. earthenware pipe sewer, 245 yards in length, in Back-lane, Woodland View, Stannington, for the Worley (Sheffield) Urban Rural Sanitary Authority. Mr. Geo. E. Beaumont, engineer and surveyor, Grenoside, Sheffield. —  
Dearden & Jackson, 40, Rutland-street, Sheffield (accepted). £206 10 9

**STROKESTOWN (Co. Roscommon).**—For additions to residences at Yaption, Sussex, for Mr. W. A. Hounsom, Mr. E. J. Hamilton, architect, Brighton. No quantities provided. —  
Bicknell & Pile, Littlehampton. £750 0 0  
W. Pratt, Bognor. 679 18 6  
Suewin Bros., Littlehampton. 635 0 0  
Booker Bros., Bognor. 615 0 0  
A. E. Booker, Waltham. 690 0 0  
A. Burrell, Arundel (accepted). 592 0 0

**STUBBINGTON.**—For the erection of new kitchen, scullery, &c., at Stubbington Lodge. Mr. Wm. Yearley, architect, Gosport. Quantities supplied. —  
E. Tuttle. £263 10 0  
C. Wareham. 803 0 0  
W. Jenkins. 753 0 0  
C. M. Dashi. 708 10 3  
J. Plummer. 700 0 0  
T. P. Hall. 678 0 0  
J. Crockerell, Landport (accepted). 508 0 0

**TOTTENHAM.**—For new premises, High-road, Lower Tottenham, N., for Mrs. Thompson. Mr. Alfred Richards, architect, 3, New Broad-street, E.C. Quantities by Messrs. Gordon, Lowther, & Ganton, 16, Finsbury-circus, E.C. —  
M. A. Humphreys & Son. £1,540 0 0  
J. Giles. 1,635 0 0  
Fairhead & Son, Enfield. 1,370 0 0  
H. Knight & Son. 1,300 0 0  
Porter. 1,298 0 0  
Jarvis. 1,295 0 0

**WESTBURY (Wilts).**—For the erection of a residence at Leigh, Westbury, Wilts. for Mr. C. H. Knight. Messrs. Halliday & Anderson, architects, 10, High-street, Cardiff. —  
W. Church. £3,967 0 0  
J. Bladwell. 3,795 0 0  
Reed & Blight. 2,578 0 0  
P. J. Ponton. 3,567 0 0  
W. Bowers. 3,490 0 0  
G. Moore. 3,487 0 0  
H. Forse. 3,425 0 0  
W. Smith, Trowbridge (accepted). 3,357 0 0

**WEST HEATH.**—For the erection of Ward block at the Infectious Diseases Hospital, West Heath, King's Norton, near Birmingham, for the King's Norton Urban Rural Sanitary Authority. Mr. Robert Godfrey, engineer and surveyor, Valentine-road, King's Heath, near Birmingham. —  
Sapcote & Sons. £2,330 0 0  
T. Surman & Sons. 2,330 0 0  
Mills & Sons. 2,279 0 0  
J. Bowen. 2,227 0 0  
C. Bryant. 2,190 0 0  
James Moffatt. 2,135 0 0  
J. Bishop. 2,175 0 0  
H. Lovatt. 2,131 0 0  
Currell & Lewis. 2,117 0 0  
John Webb. 2,095 0 0  
J. Barnesley & Sons, Birmingham. 1,996 0 0  
\* Accepted.

**WOOLWICH.**—For pulling down and rebuilding the "Royal Mortar" hotel, Woolwich, S.E. Mr. H. H. Church, architect. Quantities supplied. —  
Martin, Wells, & Co. £4,553 0 0  
Milton & Wallis. 3,993 0 0  
Nightingale. 3,920 0 0  
Monday. 3,867 0 0  
Balsam Bros. 3,850 0 0  
Chapman. 3,693 0 0  
H. L. Holloway. 3,683 0 0  
J. O. Richardson. 3,537 0 0  
Proctor. 3,386 0 0

**WOOLWICH.**—For pulling down and rebuilding Nos. 82 and 83, Powis-street, Woolwich. Mr. H. H. Church, architect. Quantities supplied. —  
No. 82. No. 83.  
Wells. £1,200 0 0. £1,200 0 0  
Monday. 1,011 0 0. 929 0 0  
Nightingale. 1,024 0 0. 993 0 0  
Chapman. 950 0 0. 980 0 0  
J. O. Richardson. 908 0 0. 987 0 0  
Holloway. 893 0 0. 983 0 0  
Balsam Bros. 888 0 0. 931 0 0  
Milton & Wallis. 865 0 0. 890 0 0  
Proctor. 855 0 0. 910 0 0

**YAPTON (Sussex).**—For erecting a pair of cottage residences at Yaption, Sussex, for Mr. W. A. Hounsom, Mr. E. J. Hamilton, architect, Brighton. No quantities provided. —  
Bicknell & Pile, Littlehampton. £750 0 0  
W. Pratt, Bognor. 679 18 6  
Suewin Bros., Littlehampton. 635 0 0  
Booker Bros., Bognor. 615 0 0  
A. E. Booker, Waltham. 690 0 0  
A. Burrell, Arundel (accepted). 592 0 0

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## Ventilation of Dwelling-houses.

referring a few weeks ago to the resolution passed by the Journeymen Tailors' Union that all tailors' workshops should be supplied with an adequate amount of fresh air for person, by means of "modern ventilating appliances," we observed that the, though perfectly right in principle, asking for a luxury which is to be found few even of the most costly and well-attended residences of the wealthier classes in this country. Dwelling-houses of the class are still habitually built with no system of ventilation, save in a few small cases; and as to the smaller and middle-class town or country houses built on speculation, any idea of a system of ventilation would be regarded by their builders, if it were ever thought of at all, as commercially out of the question, involving an expenditure out of proportion to the return that could be expected in rent: and until the tenants of these houses attach so much importance to a ventilating system as to be willing to pay a higher rent for a ventilated house, it is only reasonable that the speculator-builder should take such a view. But when the tenants or purchasers of houses in a country are sublimely indifferent on the subject; and even in the case of houses specially for a private owner under the supervision of an architect, it is very rarely that the client makes any demand on his architect for the provision of a system of ventilation.

It is not to be pretended that the problem of ventilating ordinary dwellings is in any way the same footing as that of public buildings. A theatre, church, or any other meeting-room is under quite different conditions from a dwelling-house. In a room a number of persons are packed far more closely than in a dwelling-house in proportion to the cubical contents of the building; the individuals composing the crowd cannot in general change their position at pleasure, but must put up with it as it is meted out to them where they are. The occupation of the building is

only for a limited portion of the twenty-four hours. The building consists mainly of one large chamber, much easier to deal with collectively than the numerous small apartments of a dwelling-house; and while the crowded state of the building renders mechanical means of ventilation an absolute necessity in order to secure a satisfactory result, the necessary expenditure for this can generally be arranged for in such cases, as a portion of the working expenses of the building, without extravagance; and in large blocks of offices, especially such as are under State control for official purposes, a central ventilating power of some kind, either mechanical or in the shape of an exhaust chimney, can generally be applied economically to change the air of the whole building, all the apartments in which are mostly in use at the same time and for the same number of hours.

How different is the whole case in a dwelling-house. Here we have a building which is inhabited the whole of the twenty-four hours, divided into small apartments which are in use at various times, the bedrooms being empty, except at short intervals, while the sitting-rooms are in use; and the sitting-rooms entirely empty at night, while the bedrooms are in continuous occupation. In the average middle-class house the expense of a continuously-active mechanical means of ventilation, or even of an exhaust shaft in continuous working night and day, would be prohibitive. But even in large mansions where the owner could afford to keep up such a system, it would be necessary, unless there were to be a great waste of power, to have elaborate arrangements for cutting off the ventilating action from rooms not in use, concentrating it at night on the bedrooms, and by day on the other portions of the house, which complicates the problem very much, and renders a central system by no means so obviously applicable to even the largest class of dwelling-house as to a public building.

A central system has however in all cases one obvious advantage, that by admitting the whole of the air for ventilation by one main inlet, for distribution thence, the temperature of the air of the whole house can be regulated in the simplest manner and at the least cost. It is this fact especially which seems to have fascinated Drs. Drysdale and Hayward, who now publish, under the somewhat high-sounding title of "Health and Comfort in Housebuilding," a third edition, with con-

siderable additions, of the work\* in which they recommend the system on which they have ventilated their own houses. The authors in their preface to the third edition express a mild and dignified surprise that a new edition should be called for, inasmuch as in a certain "Dictionary of Engineering," 1874, their system was described as "a truly scientific and rational one," with other expressions of approval; and after such an opinion they had hoped "there would have been no further need of a work like this, but that the practical points would have been incorporated by this time into the ordinary literature of architects, sanitarians, and engineers." This is a good deal to expect as a result from the commendation of a single not very widely-known publication (which we observe is issued by the same firm who publish the work thus commended); but the authors write in the true spirit of doctrinaires, who have formed a system theoretically satisfactory to themselves, and cannot understand how its perfectly satisfactory character should not be equally apparent to every one else. Finding however that their principles have not yet been generally admitted or put into practice, and that "we have even in new houses the same patchwork ventilation of single rooms with cold air, against which our book was directed, a new edition is therefore called for." This is a somewhat lofty position to assume, and we decidedly contest the right of the authors to pose as the only infallible guides to house ventilation. They have the credit however, of having contrived a general system of ventilation for dwelling houses by a central exhaust and a central inlet, with very trifling expense in the working, though not without considerable expense in the first installation; and considering the usual neglect of ventilation, already noted, in building dwelling-houses, every reasonable effort to bring about an improvement in this respect should have due attention.

The authors' system, which has been noticed in former years in our columns, is, we may remind the reader, that the external air should be admitted into a chamber warmed (except in hot weather) to whatever temperature is thought desirable; admitted thence into a central lobby

\* "Health and Comfort in Housebuilding; or, Ventilation with Warm Air by Self-Acting Suction Power," &c. By J. Drysdale, M.D., and J. W. Hayward, M.D. Third edition. London: E. & F. N. Spon; 1890.



which is kept from immediate communication with the outer air, and warms the fresh air reservoir for the house; and thence passed through openings near the ceiling into the several rooms. From the rooms it is led by tubes to a collecting foul air chamber at the top of the house, from which it is drawn by a down-cast suction pipe, delivering into an up-cast flue surrounding the kitchen flue, the heat of which forms the extracting power. The chimney flue for this purpose is required to be in the centre of the house, the actual chimney being a circular metal pipe, which takes the smoke and heat from the kitchen fire, while the space around this, and warmed by it, constitutes the upcast extract shaft, "which must be so tall as to reach several feet higher than any other chimney of the house, in order to provide a long syphon for the purpose of increasing the suction from the foul-air chamber, by abstraction of the heat of the smoke." The idea, it will be seen, is that the kitchen fire, being always in use in the daytime, is an exceedingly economical exhaust power, the only loss being the waste heat which would in any case go up the kitchen flue. But the authors claim that in addition to this, the syphon form of the down and upcast flues, with the latter forming the longer leg, produces a draw even when the kitchen fire is not in use. We give this in their own words:—

"This is not a matter of theory only, but has been proved by direct observation in house No. 2, in the foul-air chamber of which strips of silk are hung over all the inlets, in order to indicate the current. These have been observed to be always blown in the right direction, even during the summer when the kitchen fire was not in use, and though all the windows are, for the sake of keeping out the cold air the blacks and the dust, made fast and not to be opened. . . . In fact the whole system becomes then another form of the Watson ventilator, with the inlets distributed throughout the whole house."

"House No. 2" means the second of the two houses of which plans and sections are given as illustrations, and which we shall probably not be wrong in concluding are the houses built or arranged by the two authors for themselves. The remark as to the windows all being kept tightly closed brings forward another feature of the scheme, one object of which, we are told, is to prevent air entering the house by any other entrance than the one main inlet specially provided. The object of this is to ensure that no air should enter the house in cold weather except such as has been artificially warmed. The authors are particular in pointing out that they do not propose to warm the house by hot air, or to dispense with fireplaces or other means of warmth in winter, but only to warm it up to what they consider a healthy standard, and to avoid draughts of cold air. If we remember right, this system of shutting up the windows completely was made one of the strongest points by Dr. Hayward in originally propounding his scheme; but there seems to be a degree of doubtfulness about it now. At all events mention is made of a house in which the authors' plan was carried out as a warm-air heating scheme as well as for ventilation; "fireplaces were rejected, the windows closed hermetically, and the entire warming was effected by means of hot air." It is not surprising to learn that "within a year or two, fireplaces were introduced, and the windows made to open." We should think so. Anything more stuffy and unhealthy we can hardly imagine; and this was, it appears, a house built by a medical man for his own abode!

Where the air is merely warmed to what is considered a healthy and normal temperature for breathing, the results need not be so disastrous; but even in this case we should like to ask whether it is seriously maintained that in summer weather, with all windows kept closed, no assistance to ventilation afforded by fires in the rooms, and with the kitchen fire, which is used as the exhaust, not burning, this central syphon ventilator draws into a house all the fresh air that is necessary or desirable for a healthy state of living? We can only say that we are absolutely

sceptical on the point, and should be sorry to live in summer, or even spend a day in, a house so constructed.

The non-use of the kitchen fire, however, was an exceptional circumstance. But taking the system in its normal working order, with the kitchen fire burning hotly and creating a good pull on the extract and inlet system, is this a satisfactory or healthy way of arranging a house for living in during summer weather? It is impossible that air admitted through this system of a cellar opening, and then a central lobby, and thence into the rooms, can have the healthy freshness of summer air admitted direct through the open window. The very idea is enough to give one a stifling sensation. We will go further, and ask whether it is even in winter the ideal of a healthy house to close all windows and pump air in through a steam coil in a cellar? The authors are desirous apparently to impose on the public, as the only right thing, the system which pleases and satisfies them. Possibly they are peculiarly constituted; or again possibly they have rendered themselves abnormally sensitive by constantly brooding over effects to keep out the outer air from their houses. Certainly their dread of open windows is something almost amusing: they return to this point again and again; open windows are bad enough in the daytime, but at night, in a bedroom, they seem to be regarded as absolutely poisonous. That is their individual experience, perhaps. We will offer them another individual experience, that of a person whom we will call "X," who has for years been in the habit of having one or more of the windows opening on his staircase (which forms a sort of central lobby from the top to the bottom of the house) open all day in all weathers (except driving rain), and the staircase filled direct with outer air; who habitually and in all seasons comes down to a breakfast-room with windows wide open, and sleeps in a bedroom with a "window-board" to raise the sash and let air in at the meeting rail. The only ill effect that X, and his family have ever experienced from this is the feeling of being half-stifled in the houses of some of their friends, who share our authors' dread of open windows. The learned authors will say perhaps that X must be a person of unusually robust health. But is not that putting the cart before the horse? Is it not possible that the robust health is exactly due to the habit of living in a free circulation of out-door air, instead of shutting it out by all possible means? In the artificial life of cities our belief is that the more "open-air" people can render their lives, as a rule, the longer and healthier will those lives be. But of course it stands to reason that people who have for half their life time cooped themselves up when in their houses will have become nervously anxious about draughts; they have artificialised their constitutions and require to be treated as greenhouse plants, and that is just what Drs. Drysdale and Hayward are encouraging.

Accepting the fact that there are many invalid and delicate people in the world, the authors' system carried out to its full extent no doubt offers a good expedient for a house for those who are already such; but the adoption of the system in full would, to our thinking, only tend to increase people's susceptibility to cold and to produce a delicate and valetudinarian race of people. Let us therefore dismiss these closed windows, hoping to hear no more of them. Leaving the windows of the house in their ordinary condition, capable of being opened whenever required, there is no doubt much of ingenuity and value in this scheme of the central extract, as of course there are many occasions when the windows of occupied rooms cannot comfortably remain open. But there are objections to its application to a house in the manner described which cannot be overlooked. In the first place, we cannot altogether accept the dictum that the exhaust system, dependent on the heat of the kitchen fire, will act sufficiently during the night when the fire is always low

and sometimes out altogether. But it is exactly at night that the admission of slightly warmed fresh air into the rooms is most valuable. Bedrooms scarcely ever have enough ventilation; they are always close in the morning, as every one knows; and because there is not that frequent going in and out and consequent movement and placement of air which occurs in a sitting room in the daytime. It appears therefore that the Drysdale-Hayward system is unlikely to fail more or less at the very time when it would be of most value. Secondly, it requires a house to be planned for it, we cannot always be conveniently done even building a new house, and application of the system to existing houses is in most cases the authors acknowledge, very difficult. We admit, however, that it is difficult to devise any efficient system of house ventilation that has not been foreseen and provided in building the house. Thirdly, the ventilating openings into rooms from once a lobby are likely to seriously militate against privacy. A conversation in a lobby must be to some extent overheard in the lobby, or so we must expect. Fourthly, recurring to what we said at the outset as to the different condition of a dwelling-house from those of a public building, we question whether the principle of a general system of ventilation for a whole house meets the requirements of a case. In a dwelling-house different rooms are used under different conditions. There is no occasion on which the want of ventilation in most dwellings is so much felt as at a large dinner party. The dining-room is then under somewhat the same conditions on a smaller scale, as a public meeting room. It is filled by an abnormal number of persons crowded together in numbers in proportion to the cubic contents of the room. A system of ventilation therefore, which changes the air of the room sufficiently often to supply the needs of its ordinary number of daily occupants, is inadequate for a dinner-party. The objection becomes even stronger in the case of an evening or afternoon "at home," or a drawing-room is often packed with nearly as close as they can stand. The authors do allude to this, stating that the extract from the drawing-room must be adequate for ventilation when the room is full; but a general ventilating system which would be adequate for this would be excessive for ordinary occasions.

The idea of the central lobby and rooms deriving their supply from it appears to us objectionable in a threefold manner: (1) as often interfering with convenient planning; (2) as being what we should call stuffy in its results; (3) as destructive of privacy. There is another objection made as to the mode of inlet provision, i.e., through the cornices of the rooms; the authors find fault with what is called the Tobin system for projecting fresh air towards the ceiling of the rooms, by which it mixes with the foul air at the top of the room and drags some of the latter down again; it; yet they themselves propose the plan of an inlet at the top of the room, with just the objection to it. The exit is to be at the bottom of the room on the opposite side. In that case one of two things must happen; either the fresh air admitted does not descend at all, but is drawn across the ceiling to the outlet at the bottom; or it descends, it does so after mixing with the foul air at the top of the room, having traversed a warming cellar and a lobby, and out from all connexion with the outside. And this is called supplying fresh air to the room!

The main idea of utilising the kitchen fire as an economical form of extractor has no doubt its value, but it requires to be guarded against the undesirable elements which the system has unnecessarily associated with it. There is no need either for the hermetically sealed rooms or the central lobby with all its various inconveniences. If the warming chamber in the basement be adopted, flues should lead from it direct to each room, with



st as easy as to lead extract flues from each room. They should not discharge into the room at the ceiling, but at a height of about a foot from the floor. This is impossible of course with the central lobby system, because at would still more effectually interfere with privacy. The inlets would have to be arranged in a decorative manner, but it is not so difficult to do that on the wall of the room than on the cornice, and we should then spare also the necessity for the portentously large cornices which are figured in the authors' sections, and which are anything but conducive to architectural refinement of effect. The outlets should all lead from the top of the rooms. Considering that the heated air produced from the ordinary occupation of a room rises to the ceiling, this is a natural and commonsense, in fact the scientific method, of arranging it; inlets low, extracts above. Extra inlets should be made for drawing room and dining room, provide for occasions when the rooms are full of people, and all inlets in the various rooms should be capable of being readily opened and closed whenever desired. By this means there need be no extra demands on the tract power when extra ventilation was required for crowded entertaining rooms, as the inlets to the bedrooms and other rooms in use could be shut off and the current incoming air directed through the extra inlets in the entertaining rooms instead. Arranged in this manner, there would be no necessity for a special plan of house in order to make the system work, a necessity which is practically an almost fatal obstacle to the employment of the authors' system. Only people who are possessed with a ventilation mania could consent to plan houses in a special and then by no means convenient manner simply for the purpose of adapting them to a scheme of ventilation. Houses are not built for the mere purpose of being ventilated, any more than theatres are built (as some people seem to think nowadays) for the mere purpose of making exits from them; and a system which makes that demand will never come into general use. It is opposed to common sense. We have still the defect to encounter, that the extract worked by the kitchen flue is weakest at night, or may even cease to act completely, and that the system in that case would be a partial failure as to the ventilation of bedrooms at night, which is really more important than that of sitting-rooms by day under the ordinary conditions of everyday life. The adequate ventilation of bedrooms is really the most difficult problem in house ventilation, as it is only in a minority of cases that fires are used, and those must necessarily be left to go out in the course of the night. The separate ventilation of sitting-rooms for everyday occupation is not a difficult matter, because when fires are used, the room can be admitted from behind the grate, and the fireplace is itself an extractor; and at times when fires are not wanted the windows (pace Dr. Hayward) can be opened. The class of extract ventilators which create a draught by the impingement of the wind upon them are some of them exceedingly effective when there is wind stirring; but unfortunately they are powerless at the very time when we most require ventilation, when the weather is calm and sultry. Perhaps our authors' system promises more of a result than can be obtained by other means, except costly ones, granting a little extravagance in the manner of making up the kitchen fire for the night. With a house fitted with a complete system of hot-water heating, worked so as to retain its heat through the night, it is easy to induce an incoming current of warmed air through a coil under the window-board, communicating with an external opening. But this is a more expensive installation than can be afforded in many middle-class houses. In such cases we are still of opinion, in spite of the denunciations of the authors against the admission of external air into bedrooms, that the simple device of the closed sash with a deep bottom rail, allowing a vertical inlet for air behind the meeting-rail,

is at all events less injurious to the health of the occupants than sleeping with no ventilation at all. Still, if it can be kept acting adequately through the night, the authors' system, with the limitations above stated, is the only tolerably inexpensive one which has been proposed for keeping up a change of air in bedrooms at night, without opening the windows; and if it can accomplish that object, that will perhaps prove to be its chief value: but the inlets must not be made at the top of the rooms.

#### NOTES ON THE NEW EDUCATION CODE.

**T**HE new Code of Regulations as to Elementary Schools came into operation on September 1. It contains some points of special interest to our readers. The first is that Drawing has now been made an obligatory subject for boys in the older schools—that is, for boys who are not in the infants' department. It also has its place as one of the optional subjects in boys' classes throughout a school. This recognition of drawing as a necessary part of elementary education is an important step. It marks the beginning, it cannot be doubted, of a system of technical education in England. It is a very tentative beginning, but it is real one, and it is in accordance with national habits to do things in a piecemeal and unsystematic manner. Our neighbours across the Channel would have produced a beautiful system, which, in the long-run, would very likely have no more important results than our own shy beginning. It will be interesting to observe what results follow from the commencement. But at the present moment the most difficult practical question is the way in which this new subject is to be taught.

In large schools in large towns there are teachers more or less ready; in the rural districts it presents grave difficulties. The ordinary certificated teacher cannot, as a rule, teach drawing. In due time drawing will, no doubt, become one of the subjects in which every teacher can impart information to pupils. It may be doubted, indeed, whether the teaching of drawing under these conditions will be of much value, though it may no doubt give opportunities to boys who have some talent with a pencil to show what they can do, and so obtain a place in the technical schools, which must in time become a part of our educational system. So far as we can see, the best plan for the present, at least in a large number of districts, will be for a certain number of districts to combine and support a common drawing-master. We are by no means sure that this will not ultimately prove to be the best permanent plan, but it seems at any rate to be the only way by which for some time to come districts in rural places, or districts in moderate sized towns, can satisfy the requirements of the new Code.

The second point of importance in regard to the new Code is Schedule VII., which is entitled, "Rules to be observed in planning and setting-up Public Elementary Schools." According to Article 85, these rules apply *primâ facie* to new premises and enlargements only. But as the Education Department must be satisfied that all existing schools are healthy, properly constructed, supplied with suitable offices and accommodation, it would appear that indirectly the schedule is to a large extent binding on existing schools. Take, for example, Article 15 (b) of the schedule, which states that "all playgrounds should be properly levelled, drained, enclosed, and fitted with some simple appliances; a portion should be covered, having one side against a wall." If this regulation is obligatory in the case of a new school, why should it not be so in the case of an existing one? We are inclined to think that though the Department may say that such a regulation must be complied with in the case of a new school, it will practically enforce it also in the case of an existing school by saying that such a school does not comply with the Article 85,

the purport of which we have already given, if this regulation is not followed. It would be impossible to give verbatim the whole of this schedule; if our space permits, we may on a future occasion reprint it for the use of our professional readers. It will be useful, and it may even be amusing. For example, the first article under the heading "Building Rules" is entitled "Planning and Accommodation," and the first section begins by telling us that "In planning a school the first thing is to seat the children in the best manner for being taught." We shall next expect to see in an engineers' manual some such advice as that in planning a dock for ships the first thing is to construct it so that ships may get in and out and be unloaded. It is really too ridiculous that such solemn official truisms should be gravely printed in such an important document as the new Code. Practical information, as that "the proper width for a schoolroom is 18 ft. to 20 ft. (according to length) or 22 ft., is useful, though it appears to be singular, to say the least of it, that the proper width of a schoolroom should be defined, but that no directions are given as to its length. According to the ordinary reading of this regulation, a schoolroom may be as long as you please, but it may not be wider than 22 ft. The schedule contains eighteen headings which refer to structural matters. No. 4 is walls and roofs; No. 5, entrances; and so on. Most of the directions are of an elementary character where they are of a general nature; where they are special, they are more important, because they state details which must be complied with by those builders and architects who are engaged in erecting school buildings. It is a little surprising that such a series of regulations was not before published, and it is probable that its very publication will enable it from time to time to be amended as its practical results are observed and new inventions and improvements are brought into existence.

#### THE CONVERSION OF TIMBER BY MACHINERY.

BY SAMUEL W. WORSSAM.

**I**N the conversion of large logs of timber,—hard or soft,—into flitches and boards, the tools generally used are the circular saw, the frame saw, the horizontal reciprocating saw, and the band saw. The first-named is in most universal use, by reason of its great producing power and the facility with which it can be manipulated, although at the same time the most costly, alike as to waste of stuff and absorption of horse-power.

**Circular Saws.**—For a log of 36 in. scantling, a saw of at least 78 in. diameter and 6 easy b.w. gauge is necessary; this means a wide kerf, with a corresponding waste of material. The cost of such a saw is 45*l.*, and the angular velocity 450 revolutions per minute, giving a speed at the periphery of 9,225 ft. per minute. Forty-five horse-power indicated is absorbed in driving a machine carrying so large a plate, and the average rate of cutting is 8 to 10 ft. per minute for hardwood and 18 ft. for soft.

The saw works in a rack bench with travelling table running on rollers for the log, and weighs 9 tons, the cost of the same for logs 36 in. x 40 ft. long when fixed ready for work being 325*l.* It may not be out of place to remark here that, up to the present at least, it has not been found practicable to run saws of greater diameter than 78 in., although larger saws have been made. One was exhibited in 1862 of 87 in. diam., 5 full b.w. gauge, and cost 60*l.*

Occasionally, for logs of greater dimensions than 3 ft., two circular saws are employed, one working above the other on separate spindles, but this arrangement is not recommended owing to the difficulty of getting the saws to run conjointly in a true plane.

**Frame Saws.**—The second machine in the list,—the frame saw,—has the advantage of the circular when logs have to be sawn into



boards, inasmuch as many and much thinner saws can be used simultaneously; thus, for converting a 36-in. log into 1-in. boards, thirty-four saws are requisite, each of 13 b.w. gauge, whereby there is much less waste of wood as against the circular-saw having 6 slack b.w. gauge. The number of strokes of such a frame carrying thirty-four saws is 120, and the cost of the set, with hook buckles, tillers, and keys, 45*l*. Such a machine weighs 12 tons, and the price for balks, 36 in. by 40 ft. long, fixed ready for working, is 600*l*. The average rate of feed, which is intermittent, for hard wood is 8 in. per minute, for soft 15 in. The blades are keyed in a swing-frame, the tension on each being about 1 ton to every inch of width; a travelling rack or drag carriage running on rollers serves to carry the log.

On a comparison of these two modes of conversion, it is clear that for boards the frame-saw is more economical and productive; as a matter of fact, the circular should only be employed in ripping logs into fitches, which are subsequently re-sawn by the frame into thinner stuff or leaves.

The next reference is to the horizontal saw-frame, which usually carries but one blade. The saw runs at a high speed and cuts inwards and outwards of the stroke, the guides of the swing frame being fixed obliquely in such manner that the saw-teeth clear the cut at each half stroke. This saw, albeit somewhat slow in production, is, owing to its thinness, very saving of stuff, and specially serviceable for opening up costly woods which have to be re-sawn when their character is ascertained. For balks 36 in. by 40 ft. long the weight of the machine is eight tons, and the cost fixed for working, 400*l*. The saw is 6 ft. 6 in. long by 6 in. wide, and 15 b.w. gauge, and makes 190 strokes per minute. The indicated horse-power necessary for a machine of this character is 12 horse-power. In hard wood the average rate of feed, which is continuous, is 2 ft. per minute, in soft 4 ft.

A duplex horizontal saw-frame has lately been patented for operating two saws independently of one another. These are strained in separate swing-frames situated back and front of the main standards, driven from one crank shaft and reciprocated alternately to be in equilibrium.

A vertical single-blade frame is now and then serviceable where limited motive power and ground space only are available; but it is rarely run at high speed on account of risk of vibration, increased production being attained by increase of stroke.

**Band Saws.**—To advert to the band-saw—the last enumerated—is to trench on debatable ground and fish in troubled waters. This, although one of the most important innovations in the wood-working machine category, has given rise to greater controversy among manufacturers and users than any other. Few of these agree as to its merits and demerits as a means for the conversion of heavy work. In France and the United States its employment is universal, whilst in this country, where it originated, it has hitherto failed in finding favour. There may be many explanations for this; the difficulty with the saw itself, due to inferior quality and consequent breakages, the want of skill in the operative, and the impracticable design of the machine. Our sawyers apparently do not appreciate the fact that a band-saw requires greater care in manipulation than either of the other types mentioned. The French and Americans, on the other hand, have given to it their most careful attention, and with satisfying results.

Unquestionably for heavy work, given a good saw, carefully designed machine, and skilful hands, the band-saw is better adapted than any other, alike for the saving of horse-power and economy of production, apart from the fact that the travel of the saw being continuous it turns out superior work, which requires less subsequent dressing.

The highest quality of saws are manufactured by M. Perin, of Paris, who has made it his task to ensure that they shall withstand the necessary strain and tension they have to

bear without fracture. He has likewise introduced simple modes of re-joining or brazing them when this does occur. Means have been devised to reduce the risk of snapping, which frequently arises from the too rapid cooling and contraction of the blade after ceasing to work. Modifications of the saw guides have been effected with a similar object.

In the States, webs of so great a width as 8 in. are in operation, but there is no gain in this; on the contrary, blades not exceeding 4 in. or 5 in. are found superior in not requiring so great tension and correspondingly heavy pulleys, and being liable to less friction in the kerf. The saw must be perfectly parallel in width and thickness, and of uniform temper and set throughout; the form, space, depth, and set of teeth should be carefully studied. The gullet shape of tooth, i.e., teeth with half-round throats, is preferable for soft wood, and the hand-saw for hard.

In practice it is found advisable to have small, loose, adjustable pulleys situated immediately above and below the stuff, and bearing against the inner flat face of the blade to obviate the necessity of straining it to a straight line between the points where it leaves the pulleys, whereby a lesser degree of tension and tautness is necessary. This is an important factor which has not been sufficiently recognised by designers and manufacturers. Any plan lessening the tension of the saw minimises the chance of breakage, and lessens the otherwise requisite strength of the pulleys and standards of the machine.

Referring to the machine itself, this should be substantially and proportionally constructed, with pulleys not less than 6 ft. diam., the upper one being as light as consistent with strength, it having to be driven by the saw from the lower. The rims of the pulleys should be lagged with wood, or covered with leather or india-rubber, to make an elastic cushion for the saw, although the writer has knowledge of a large machine, running for some years, the pulleys of which have no covering whatever; they are turned slightly convex, and the blade runs like a belt on riggers. The pulleys may have flanges, but these should serve only to prevent the attendant when mounting the saw from passing it at the back of them and damaging the finely-sharpened teeth. Should the blade unduly press against these flanges, or any fixed runner or guide, it will immediately buckle and swerve from the true line of cutting. Care must be paid to the design of the tension appliance to provide against the contraction and expansion of the saw whilst working.

With all these points strictly attended to, no reason can be adduced why this class of machine should not be as approvingly received at home as it is at present abroad.

In this country the prevailing type of band-saw machine is the vertical, which for logs 3 ft. by 40 ft. long, costs, when fixed ready for working, 480*l*., and weighs 10 tons. The saw pulleys are each 6 ft. in diameter, and make 300 revolutions per minute, giving a travel to the saw of 5,700 ft. This itself is 42 ft. long, 4 or 5 in. wide, 17 b.w. gauge, and costs 8*l*. to 10*l*.; 20 horse-power ind. is absorbed in operating it, and the rate of feed, which is continuous, in hard-wood is 3 ft. per minute, and in soft 6 ft. The log is advanced to the saw on a table running on rollers.

In France these figures somewhat differ, as there the machines are of less solidity, many of them having the travelling-tables made partly of wood.

For logs 1'00 by 4'00 long, the cost of a machine fixed ready for work in Paris is 9,250 francs. The pulleys are 2'00 in diameter, having the rims coated with buff leather, and making 350 revolutions per minute. The saw is 10 centimètres wide and 14 dixièmes de millimètre gauge. The indicated horse-power absorbed is 20 h.p., and the rate of feed in hard wood 1'00 per min., in soft 2'00.

For re-sawing fitches 24 in. deep by 6 in. thick, a double band-saw machine is coming into vogue; in this case, the two saws run

independently of each other, although pulleys are on the same standard. To insure uniform travel of the saws, they are worked from one counter shaft only. One blade will be longer or shorter than the other, according to circumstances.

For fitches 24 in. deep and 6 in. thick, such a machine costs, when ready for working, 370*l*., and weighs 6 tons. The diameter of each pulley is 4 ft., and makes 250 revolutions per minute, giving each saw a travel of 4,375 ft. per minute. The initial length of each web is 32 ft., width 2½ in., and 18 b.w. gauge, and costs 4*l*. The indicated horse-power consumed is 10; rate of speed in hard wood 4 ft., in soft, 12 ft. The fitch is fed by the saws by adjustable vertical rollers.

Band-saw machines are designed and constructed to operate vertically and horizontally, but the former type is generally selected, and is that here treated of.

There are some other machines used in the conversion of balks, such as those for cut veneers, &c., but these are omitted for present, as not coming strictly within the scope of this article. S. W. V.

#### NOTES.

**THE** collapse of the Southam Dock Strike is another piece of evidence that, powerful and active as have been the labour combinations of the last few years, they are not omnipotent. The fact is that in existing general contest between capital and labour, there are, as it were, armies engaged on each side in different places in different parts of the world. The victory rests with that army which is best disciplined, organised, and commanded. The analogy to actual warfare may be paralleled in other particulars. The fact, however, which is becoming more and more clear, is that in the future the success of labour combinations over capital is likely to grow less and less. For a long time unions among workmen did little more than raise the rate of wages to a more reasonable standard, and obtain a legitimate recognition for the claims of the artisan. Such unionism was essentially protective of the interests of the labourer. It is now changing its aspect, it is becoming aggressive. It is not so much protective, and is a force attacking capital rather for the purpose of humbling the employer and exalting the labourer, than for protecting the real interest of workingmen at large. This stage being reached, it is obvious that public sympathy will be turned to the employers, and also that the latter will combine generally to resist aggressive trade unionism. The very important Ship Federation is an instance of this tendency. The result must be a series of checks to trades unionists whenever they have no immediate ground for their warfare. It is likely also that in this country the labourers sooner or later be divided into two camps: those who are unionists, and those who are non-unionists. It takes time for men to see that there can be a tyranny of labour over any other ruling power; but as soon as it becomes evident, we are much mistaken if many artisans will not prefer to be free men, rather than be under the dominion of trades unionist organisers.

**A** KIND of shudder must have run through all the civilised world at hearing of the burning of part of the Alhambra. We are not of those who think that there can be again be in the world as fine architecture as there has been, but there are some buildings which seem to stand quite apart in their combined artistic and historic interest, and destruction of which would be a loss to the whole world, which could never be made good. The Alhambra, like the Taj Mahal, Mark's, and the Ducal Palace, is unique, and it is to be hoped that double vigilance will be exercised over the safety of the poem happily untouched. The catastrophe reminds one also that we have been told only a



years ago that the Ducal Palace at Venice is full of combustible material, and exposed to the greatest risk from fire in the case of the slightest accident setting anything alight. The misfortune in these cases is that the people who have the immediate custody of these precious buildings are not those who care most for their preservation. It is the outside world that watches anxiously for the safety of the Ducal Palace, the burning of which would probably be regarded by most of the Venetian official authorities as only an opportunity for erecting "more commodious premises" on the site. And as to the Alhambra, we learn from the *Times* telegram that "At a Cabinet Council held last night it was decided that a Government delegate should go to Granada to estimate the amount of the damage caused by the fire at the Alhambra Palace, and to report upon the possibility of restoring it." The Council might save themselves the trouble of the latter inquiry. They cannot store it, at all events.

NOW that drawing has been made one of the obligatory subjects in public elementary schools the question naturally suggests itself—will it be made one of the ordinary elementary subjects in schools for the upper classes? Will the sons of professional men in the small schools, and in the best public schools, be taught drawing as a part of the ordinary school course? The public schools are not quick to change their system, and it must be admitted that in regard to saving they have hitherto been behind the rest. There are already artists enough and to spare, but an elementary knowledge of drawing is really a necessity of ordinary life. Not only for many subjects of study is it useful; it is also required in many details of daily life. Does a householder wish to have a new cupboard in his hall, a sketch of the article which is in his mind will explain his wants to the workman better than half-an-hour of verbal or two pages of written description. We may put this argument on one side, and cause how can the private and public schools of England any longer refuse to regard drawing as a necessary part of a boy's education, when sons of artisans and labourers are in future to be taught the use of the pencil, and when drawing has been placed on a par with reading and writing in the elementary educational system?

MR. W. J. LOFTIE recently called attention in the *Times* to the acts of vandalism which are committed in Egypt. He pointed out that oftentimes portions of ancient monuments are broken up by the natives, in order to avoid the fact becoming known that they are in possession of these relics, such possession rendering them liable to punishment. But the preservation of ancient monuments nearer home is not an easy task, and, considering that the preservation of the lives and property of native Egyptians has only recently, thanks to English and English officials, become an accomplished fact, we must not take it too much to heart if the monuments of ancient Egypt are not yet as safe as we could wish. But even the preservation of monuments in Egypt may be effected by a little English vigour and management, and we would suggest that were Mr. Loftie, and others interested as he is in ancient relics, to make representations to the Egyptian Government, to English officials, and the English Foreign Office something could very soon be done to put this matter on a better footing. But when we abuse the Egyptian officials, and the Egyptian fellah, we must not forget the modern Goth, who, the guise of an English or American tourist, traverses Egypt seeking some monument to disfigure with his initials, or some relic which he may purchase for his lobby in Kensington or Boston. Strict legislation against the acts of Vandalism committed by tourists is as necessary as better laws for the preservation of Egyptian monuments against destruction by the fellah.

WE are glad to see that the Church of England Temperance Society has made representations to the Boards of the several English Railway Companies in regard to the supply of proper filtered water at stations. Suitable drinking fountains should be placed on every platform, and every refreshment room should be supplied with a proper filter where cold fresh water can be obtained. While we advocate these things, it is also well to give a word of warning. Drinking fountains and filters, unless carefully looked to, may become a serious danger to health, and the traveller, who at present may have to travel troubled with a thirst, may after all be better off than one who, having assuaged his thirst at a railway drinking fountain, has imbibed the germs of typhoid fever. It is for this reason that large properly-constructed cisterns, fitted up with a proper filtering apparatus, and placed in a cool position, well protected from dirt and air, are much safer than the smaller filters which are often seen in private houses and hotels, which seldom are receptacles of dirt. But that drinking fountains, from which wholesome water can be obtained, should be found in every station we cannot doubt. The season of thirst is passing away, and that of cold is coming. We would, therefore, urge upon railway companies not only to put up drinking fountains, but to take better measures to warm waiting-rooms. The open fireplace warms only a narrow circle immediately around it, and it produces draughts. Every waiting and refreshment room should be uniformly heated by hot air or water. This is one of the greatest needs of the travelling public.

IN a communication to *La Construction Moderne*, September 13, an architect, M. Taravant, suggests the bold idea of hanging the centreing for large bridges instead of building it up. According to a diagram accompanying his article, he proposes carrying up a temporary wall in brickwork or masonry above the central portion of the pier between two intended arches of a bridge, and suspending from this a light system of iron bracing arranged somewhat like an inverted cantilever on either side of the central support, and to this system of iron bracing the timber centreing is to be fixed, following the quadrant form necessary for the half arch, which would be built on the centreing round the iron ties. How these are to be cut out and removed from the masonry afterwards is an important question, the answer to which may be given in the remainder of the article, which is decorated with an "à suivre" at the close. We presume it is hardly proposed that they should remain in the masonry. M. Taravant claims that on this principle much wider-span arches could be built than by depending solely on a built-up timber centreing. The advantage of the system, if it can be brought into use, would be most apparent in the case of viaducts on very lofty piers. For bridges of low proportions we doubt if it would offer any advantage either constructively or financially.

FROM some correspondence in the *Coventry Herald* it seems that the question what to do with the bells of St. Michael's is still a subject of agitation. The only point on which every one seems to be agreed is that the old tower will not stand a swinging peal of bells. The Rev. A. Starkey, the vicar of Ryton, writes to protest against erecting them as chiming bells, rightly saying that only by ringing do you get the full effect of bells. On the other hand he deprecates building a new campanile near the church, from fear of interfering with its architectural effect, and proposes building one at some distance on a site of its own, simply that Coventry people may have their bell peal again. That would be quite a mistake. The ringing of bells in peal has been associated with the church for ages; it would seem purposeless and lose half its beauty when "secularised." We believe it would be quite possible to build a campanile in contiguity to the church which would not

spoil it architecturally, and that no other course will meet the case. It is desirable to have the bells rung and not chimed, and to have them rung in connexion with the church; and to build the new campanile is the only way in which this object can be carried out.

MR. ST. JOHN HOPE wrote to the *Times* of Monday a letter, dated from "The Museum, Silchester," which ought to command attention from the commonsense and reasonable views which the writer takes as to what can and cannot be done at Silchester. Mr. Hope is one of the professed antiquaries (there are not too many of them) who does not allow his antiquarian zeal to betray him into a forgetfulness of facts and possibilities. He is speaking only too truly in saying that "no English Government and no such body as the Hampshire County Council will ever spend money on the acquisition of any site of antiquarian interest." Mr. Hope does not "bring railing accusations," he contents himself with simply stating the fact, which is indubitable. We are not clear that it is even the duty of a County Council to do so; County Councils were appointed for other ends. A Government is less restricted in its functions, and might very properly expend money on such objects under certain conditions; but no one can expect the Government of this country to indulge in such weaknesses. Mr. Hope's suggestion is that a more permanent Museum should be built on the site, for the safer housing of objects found, and that excavations should be continued, but on a system of covering up each portion as soon as all information has been extracted from it that is possible, in order to preserve the remains from disintegration by the weather. A regular system of planning each uncovered portion and connecting it with the rest should be carried on, so as to have in time a complete plan of the Roman city, with bench marks left on the ground which will render it easy in future to uncover again any part that may be desired, for inspection, without unnecessary disturbance of the ground.

IT is much to be regretted that there should be apparently an intention of discontinuing the services at the Whitehall Chapel on account of the small attendances; and we believe that one reason which has been given as accounting for this slight attendance is the correct one, viz.: that most people imagine that the services are not open to the general public, and require an application to an official for admittance. We were asked the very question only a few days since. We will therefore do our part towards making it known that the Sunday services at the Chapel Royal are as freely open to all comers as those of any other church in London.

THE discussion as to architects and engineers, started by M. Bourdais in *L'Architecture* of August 16, has had to be brought to a close by the editing committee, after a lengthy reply from M. Bourdais in the number for September 13, summing up with the dogma that the union of the architect and engineer is the most desirable ideal for the production both of "constructions décorées" and of "décorations construites." The same number contains an enthusiastic communication from M. Frantz Jourdain, decrying all attempts to mix up the architectural profession with engineering, and summing up with the exhortation "Let us remain architects and try to become artists." In the course of his letter he asks whether MM. Dutert, Bouvard, and Nenot came out of the "Ponts et Chaussées" or out of the Ecole Centrale, and whether they have not designed all their work (the large Exhibition buildings and the new Sorbonne) themselves. He admits that they did employ engineers, "payés à l'heure," to make their calculations, as they had draughtsmen to draw out their designs neatly, and "vérificateurs" to verify and regulate the quantities and estimates. "But this insignificant and ephemeral collaboration robs them in no



way of their personal merit and responsibility in the work"; nor is the public deceived in the matter. The names of the architects of the Exhibition buildings, the men who gave them their form and design, pass, we are told, from mouth to mouth in common conversation; "ceux des ingénieurs contrôleurs sont restés dans le paincgre," which seems to be the French form of the English name for a well-known neutral tint. There is more truth in this remark than would be quite palatable to engineers. M. Jourdain heads his letter with a quotation from "Guy de Maupassant"—"Quand vous voyez un ingénieur, prenez un fusil et tuez-le." This reminds one of Blake's remark on being shown some engineering drawings—"Ah, sir! these things we artists hate!" The French architects have certainly the faculty of being amusing in these kind of discussions, which we fear cannot generally be said of our own countrymen; how much of this elaborate "chaff" is to be taken seriously is another question.

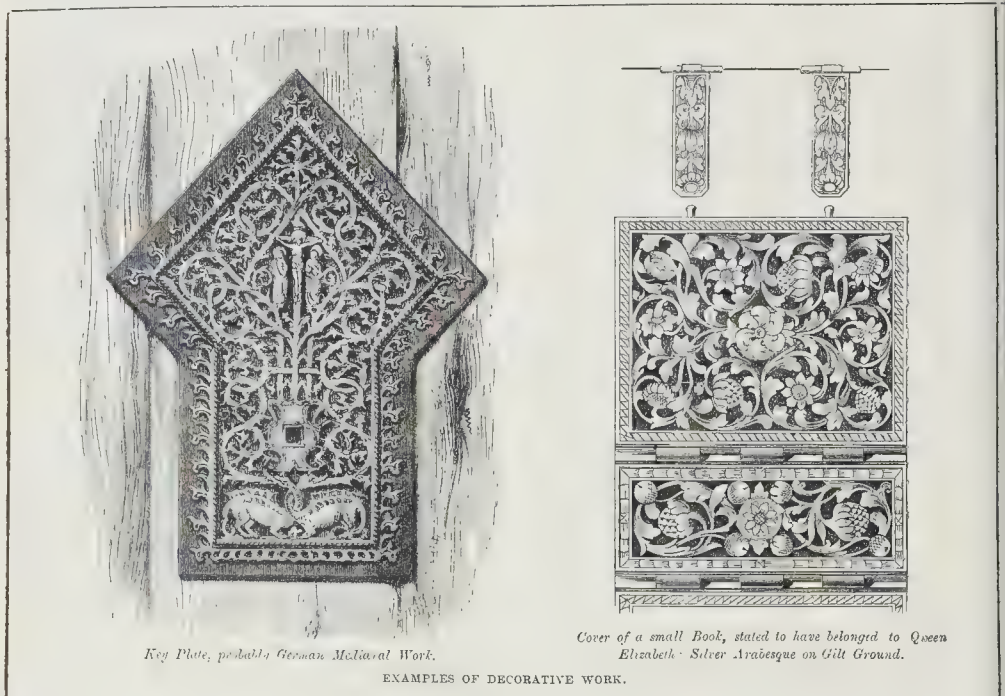
#### BRUCE CASTLE AND THE MANOR, TOTTENHAM.

THIS historical and ancient estate, now covering about 20 acres, is placed in the market, with a view to its development for building purposes. It stands in Lordship-lane that leads from the high road to Wood Green. Hard by is the parish church of All Hallows, restored and partly rebuilt in 1876-7. In the graveyard lies Margaret, wife of Mr. Samuel, civil engineer, and daughter of the Ettrick Shepherd. The property derives its name from having been the home of Robert, father of Robert Bruce, King of Scotland.

Computed at five hides or 128 acres, and valued at 25*l.* 15*s.* with 3 oz. of gold, the original Tottenham Manor, as undivided, belonged, *temp.* Edward the Confessor, to the Earl Walthof, the Waldef of Domesday survey. Walthof was son to Siward, Earl of Northumberland, to whom, as likewise to Macduff, Thane of Fife, is attributed the defeat of Macbeth. He married, in 1069, Judith, the Conqueror's niece, and daughter to Odo, Earl of

de Balliol, and Henry de Hastings, descendants of David, Earl of Huntingdon. These are the competitors for the Scottish crown at the death of Margaret, the Maiden of Norway, upon whose claims Edward I. was invited to adjudicate.

Robert de Brus's son Robert, Earl of Annandale and of Carrick, is said to have retired to this manor-house upon his return from a crusade in Palestine. Dying in 1304, he demised his share to his son and heir, Robert I. Upon the latter's revolt from England all his lands in this country were confiscated by Edward II. And so in course of time this part of the manor, belonged, in 1429, to Alderman John Gedeney, being then held by a knight's service and valued at 10*l.* The two other portions were styled Pembroke and Balliol or Dawbeney's. Bruce Castle, having suffered escheat to the Crown, was granted, in 1514, to Sir William Compton, Groom of the King's Bed-chamber. Compton set about to rebuild the house on a plan pretty much as we now find it. It appears to have been completed in 1516, for on the Saturday after Ascension-day in that year,



Key Plate, probably German Mediaeval Work.

Cover of a small Book, stated to have belonged to Queen Elizabeth. Silver Arabesque on Gilt Ground.

#### EXAMPLES OF DECORATIVE WORK.

##### EXAMPLES OF DECORATIVE WORK.

THESE two examples of the employment of decorative conventional foliage form a characteristic contrast in style and feeling, while both exhibiting the same general idea, that of foliated ornament drawn in flowing scrolls from a central or starting point. The Gothic design is thin, sharp, and crisp; the Renaissance one elegant, flowing and soft in its forms. Both are good examples of their class.

PRIZES FOR DESIGNS FOR FURNITURE, &c.—The Council of the Society of Arts hold a sum of 400*l.*, the balance of the subscriptions to the Owen Jones Memorial Fund, presented to them by the Memorial Committee, on condition of their spending the interest thereof in prizes to "students of the Schools of Art, who in annual competition produce the best designs for household furniture, carpets, wall-papers and hangings, damasks, chintzes, &c., regulated by the principles laid down by Owen Jones." The prizes will be awarded on the results of the annual competition of the Science and Art Department. Competing designs must be marked "In competition for the Owen Jones Prizes." The next award will be made in 1891, when six prizes are offered for competition, each prize to consist of a bound copy of Owen Jones' "Principles of Design," and the Society's Bronze Medal.

Albemarle. William I. had given it to his nephew-in-law, together with the earldoms of Huntingdon and Northampton. After the execution, at Winchester, of Walthof, as a suspected traitor, in the year 1073, the manor, for an interval enjoyed by Judith his widow, devolved upon their daughter Maud, who brought it in marriage to King David I., son of Malcolm III., Cean-Mohr. David I. was confirmed by Henry I. in all of Walthof's titles and possessions.\*

As thus annexed to the earldom of Huntingdon, Tottenham Manor passed to Simon de St. Liz (Maud's first husband), and to his son and grandson of that title; and, on their failure in line, passed by royal grants to the Kings Malcolm IV. and his brother William the Lion, grandsons of David I., who died in 1153. William the Lion bestowed it upon his brother David, Earl of Huntingdon, whose son John, surnamed Le Scot, inherited from his mother, Maud, the earldom of Chester. John married Helen, daughter of Llewellyn of Wales, and died without issue. In 1254 a survey was taken for dividing the land between his co-heirs: Robert de Brus, John

Henry VIII. meets his sister Margaret, Queen of Scots, "at Maister Compton's hous beside Totnam." Compton set up his coat-of-arms in the old porch; and is supposed to have built the three detached towers, one of which, near to the well, still stands. In 1605 it is bought by Thomas, Earl of Dorset; twenty years later Edward, Earl of Dorset, conveys it to two individuals, whose name is familiar in connexion with the history of the Grosvenor estate, London—Thomas and Hugh Audley. The Audleys, however, parted with the property within twelve months to Hugh Hare, elevated Baron Coleraine on August 31, 1625. His descendant, Henry, third Lord Coleraine, demised his estates to his natural daughter, Henrietta Duplessis, who (as the tale goes) being an alien could not succeed; yet the will, being legally executed, barred the heirs-at-law; so the property again escheated to the Crown. But a grant thereof was obtained by a private act in favour of Alderman James Townsend, who had married that lady. This James Townsend added an east wing on to the house which Lord Coleraine had new fronted with coigns and red brick. In Dr. Robinson's "History of Tottenham" (1840), is a plate copied, we gather, from Wolridge's picture, showing the Castle

\* For some particulars of Walthof's parentage and career see Charles Kingsley's "Hereward the Wake."



as it appeared in 1686,\* with another that shows the house as it was fifty years ago, with a third story added in lieu of the four gables. The front has a lofty central tower with galleries and cupola, flanked by two octagonal towers half engaged. On September 24, 1789, Thomas Smith, of Gray's-inn, buys Bruce Castle, with sixty acres, for 6,800*l*. In 1827, John Ede, who pulled down the west wing, sells it, with fifteen acres, to the brothers T. W., Edwin, Frederick, and Rowland Hill (afterwards secretary of the Post Office), sons of Thomas Wright Hill, of Hazlewood School, Birmingham, who here established a boys' boarding-school that has continued to our own time. Dr. Robinson mentions a singular custom of this manor. At the death of the owner or tenant, his body was carried to the church through an opening made in the wall of the house, instead of through the porch. David I. of Scotland gave the church to the priory of Holy Trinity, London; Henry VIII. bestowed it upon the Cathedral of St. Paul.

#### THE PROBABLE EFFECTS ON WAGES OF A GENERAL REDUCTION IN THE HOURS OF LABOUR.

In the Section of Economic Science and Statistics, at the Leeds Meeting of the British Association last week (Professor Alfred Marshall, the President of the Section, in the chair).

Professor J. E. C. Munro, Owen's College, Manchester, read a paper on the above subject. In the course of his remarks, he said—A fixed, unvarying day for every worker is impossible, because (apart from the varying degrees of intensity of labour in different industries) of the necessity for preliminary work before the bulk of the labourers can begin their daily toil. We may assume for the purposes of this paper that a "normal week" for all skilled industries, due allowance being made for preliminary work, would correspond to forty-eight hours. From this point of view industries may be divided into three classes. 1. Those in which a normal day has already been established. In Cornwall, for instance, an eight-hours day has been in force for a long period of time in the mining industry. 2. Those in which the reduction would be of a moderate amount. Under this class may be placed industries where the reduction would not exceed 8½ hours per week—e.g., if the working week were reduced from 56½ to forty-eight hours. (3) Those in which the reduction would be very substantial in amount. A general reduction in the hours of labour will at first reduce the net produce available for distribution amongst producers. It is true that any improvement in the efficiency of labour given to shorter hours, the impulse that may be given to the invention of labour-saving appliances, or greater economy in the use of labour, will tend to lessen the reduction in produce; but in all industries of the second-class (i.e., where the reduction is moderate in amount), a class that includes most of the skilled industries of the country, the reduction in produce will at first correspond very closely to the reduction in hours. It has been suggested that the net production could and would be maintained (if not increased) by the employment of the unemployed. Such a suggestion implies that there is a class of unemployed possessing the requisite physical powers, mental intelligence, and technical skill required in the industries where the hours of labour are reduced. No such assumption can be granted. Indeed, there is ample ground for contending that, far from skilled industries are concerned, the bulk of the unemployed do not possess the necessary skill to engage in them. The length of the hours of labour is not the chief cause of want of employment. Excessive hours of labour are themselves the result of causes which would largely remain in force even if the hours of labour were shortened, and whilst the shortening of hours might benefit in one way the unfortunate class whose condition is described in the "Lords' Report on Sweating," it will not of necessity maintain or improve their wages. Shorter hours of labour may co-exist with poverty, especially where the supply of unskilled labour is large and combination is absent. Low wages are largely responsible for the long hours of the unskilled worker, and the first step towards the amelioration of his position would be a rise in wages rather than a shortening of hours, as the latter would follow

the former. Let us, however, assume that by the employment of additional hands the net produce (say in a year) is maintained. We have now the same amount of net produce as before, but a greater number of producers. In other words, though the total produce is the same, the production per producer per year is reduced, and from the point of view of distribution the net production per head per annum is of greater importance than the net produce. Before considering on which of the classes of producers loss in production will fall, the question arises, Will the loss be restricted to those industries (a) in which the reduction takes place, or will it extend to other industries (b)? If the (a) producers consume their own products the loss will fall on them; but, as a rule, one form of wealth is created in order to be exchanged for another form, and hence to the extent that the (b) producers are consumers of the (a) produce they will participate in the reduction of the net produce. If the demand of the (b) producers continues in intensity they may have to bear the whole loss; on the other hand, the demand may fall off to such a degree that the (a) producers will suffer; but the probability is that the loss will be shared between the two classes, and therefore all industries will tend to be affected. A reduction of hours in some trades will tend to affect all other trades, inasmuch as by the migration of capital and labour the reduction in the net produce may be spread over all industries. Whether the capitalist or the labourer will bear the loss will depend largely on two considerations, viz., (1) the extent to which labour or capital migrate to foreign countries, and (2) the effects of the reduction of hours on population and on capital. The effects on capital are so important as to require separate consideration; and since population will not be directly affected we have only to consider the possibility of capital and labour migrating to other countries. In this respect capital has the advantage. Owing to the growth of banking and financial houses, and the development of foreign trade, capital possesses an international organisation, and can be promptly and readily directed to the best openings. Labour, on the other hand, moves slowly; it deteriorates by non-use, and possesses no international organisation. It is, therefore, highly probable that a large share of the reduction in the net produce, due to shorter hours, will be thrown upon labour. It remains to consider how far the foregoing conclusions may be effected by (1) monopolies; (2) combination; (3) methods of paying wages. (1) A monopolist, whether a private person or a group of persons, or a municipality, or a State, will usually be able, according to the intensity of the monopoly, to throw the whole or part of the loss due to a reduction in the hours of labour in his industry upon those who use the article or the service subject to the monopoly. (2) Combination may be resorted to by labour as a method of preventing outside labour from coming into an industry. To the extent that combination enables producers to control the production of a given article, to that extent a trade may escape sharing in a loss due to a reduction of hours in other trades. (3) Hitherto the methods of paying wages have not been taken into account. As a rule, wages in the skilled trades are paid by piecework; the spinner and the weaver receive a certain rate of wages for every yard they spin or weave respectively; the miner is paid by the ton, and the bricklayer by the yard. In other trades wages are paid by the hour, whilst in the unskilled industries wages are paid by the day of a varying number of hours. A reduction of hours where piecework prevails would not *ipso facto* affect the "rate" of wages, but would lessen the "amount" of wages, inasmuch as a fewer number of yards would be woven and a fewer number of tons obtained in the shorter hours. The wages earned in a year would be reduced in proportion to the reduction in hours. But this would not leave the capitalist in the same position as before, as he would have a smaller gross return on the same amount of fixed capital; and if he has only been receiving an economic return before, a reduction in the "rate" of wages may be required to prevent a migration of capital into some other industry. Where wages are paid by the hour similar results would follow. In both the above cases the method of paying wages is such that a reduction of hours reduces automatically the "amount" of wages without affecting the "rate" of wages; but

where labour is paid by the day the method of payment will, if no alteration takes place, continue the same wages as before for a smaller amount of labour. In so far as the net produce is diminished a check will be given to the accumulation of capital. Capital will tend to avoid undertakings where the reduction of hours lengthens the time of completion. Where interest is paid on capital out of capital during the construction of the works, any extension of time will necessitate a corresponding increase in the capital required, just as any contraction of such time will reduce the capital required. Hence we reach the conclusion that the reduction in the hours of labour may check the accumulation of capital and cause at the same time an increased demand for it, and so raise the rate of interest. The adoption of a double shift, say of eight hours each, instead of one shift of, say, ten hours or twelve hours, will increase production more than the reduction of hours diminished production, and as such a system is only possible in certain trades, its sudden adoption will affect relative values. Turning to the products of labour that are bartered between nations, a reduction in the hours of labour may (1) destroy the gain arising from international trade, or (2) only diminish it. Where an exporting country possesses a monopoly of production arising out of climate or natural resources, it will be able to make a better bargain in the export market than if such a monopoly did not exist. To the extent that a country reducing its hours of labour possesses a monopoly of production, it may throw a large portion of the loss on its foreign customers. But a monopoly that depends on special productive power may be destroyed by a reduction in hours, and foreign customers may be able to obtain better terms from other States. The main conclusions, then, at which we have arrived may be summed up as follows:—1. That a reduction in the hours of labour which is neither universal nor uniform will tend to reduce the net produce available for division amongst the producing classes, but such reduction may be lessened or counteracted by greater efficiency in labour and in the use of capital. 2. Capital will be able to throw a portion of the loss on labour, and labour generally will be affected. 3. That any check to the accumulation of capital due to the reduction in the net produce will tend to raise interest and lower wages, but this may be avoided to some extent by the more economic use of capital. 4. That the reduction in hours will not necessarily lessen the number of the unemployed, inasmuch as it will not increase the purchasing power of the consumer, and will not affect the chief causes of poverty incident to our present organisation of industry. 5. That the position of the chronic unemployed or residuum will not be materially improved. 6. That in so far as additional labourers are employed to maintain the net produce, it will be at the expense of other workers, if the net produce remains the same but the number of producers increases.

In the discussion which followed (we condense somewhat from a longer report in the *Leeds Mercury*).

Sir Douglas Galton said he wished to emphasise the very great importance of the health of the working man. Health depended largely upon diversity of occupation, and the more we concentrated our working men on special work, the more necessary it was that working men should have leisure hours for recreative purposes. He should advocate, and hoped to see some day, a larger number of gymnasia in our towns, and other means for physical recreation. We might then hope that our population would increase in stamina and strength, and we might, perhaps, hope to rival the ancient Greeks, who devoted so much time to these exercises. He was strongly opposed to an eight hours day being brought about by Act of Parliament.

Professor A. T. Hadley (Yale College, U.S.A.) said that some years ago it happened that in the State of Massachusetts the hours of labour in the factories were ten per day; in Connecticut they were, generally speaking, eleven, and a careful investigation was made ten years ago by Colonel Wright, of the United States Labour Bureau, into the effect of this difference. The result was surprising, for the statistics showed that the output per day was slightly greater (although only a nominal difference) in the ten-hour mills of Massachusetts than in the factories of Connecticut, where eleven hours per day were worked. A suggestion that this

\* See also the corresponding woodcut in Hone's "Year Book" (1815).



was due to the health of those working eleven hours being injuriously affected, and that consequently they did not work so well as those who enjoyed the extra hour for recreation, was thoroughly investigated, but was found not to meet the facts of the case. In the end it was discovered that the difference was largely due to the fact that the workmen at the Massachusetts mills were of a superior class to those in Connecticut. There was a process of natural selection going on amongst those who did not mind the long day and could not stand the increased pace, and those who cared more for the extra hour of leisure and minded less the necessity for increased exertion. When men worked shorter hours they must increase their output in order to compete with those working longer hours. Suppose there was a general reduction of hours, and the output was maintained, things would go on as usual; but if the output were lessened, there must be an increase in the cost of production, and in consequence, a diminished demand for the goods.

Mr. Sydney Webb said he did not agree with Professor Munro when he laid such stress on the almost inevitable necessity of the production being so much reduced by a reduction of the hours of labour. Experience showed that a reduction of the hours of labour had been accompanied by an increase of production. It was, of course, unfair to suppose that a similar increase would hold to a corresponding extent by the reduction from ten hours to eight, or from eight to six. Although Professor Munro argued well in favour of an eight hours day, he was too much afraid that prices would rise merely because the cost of production had increased. The cost of production had little to do with prices, and he could not see how it would have much to do with capital which was not employed at the margin.

Professor Sidgwick remarked that a great deal of Mr. Webb's argument seemed to ignore the fundamental propositions of Professor Munro's paper. He (the speaker) agreed to a great extent with the chief economic conclusions of that paper. He agreed with Mr. Munro as to the very different effect that this change would have upon different industries, producing thereby, as a natural result, a disturbing effect in the exchanges as among the industries. He would also lay stress on the fact to which Mr. Munro directed attention, that it was *prima facie* absurd to have the same rule applied to all industries, considering the very varying degrees of hardness in the work when they passed from one industry to another. He held it reasonable to expect that in most cases the decrease in produce as a whole would be very material, and more than they could expect to be counteracted either by the improvement in the personal quality of the labour or by the improvement in the instruments, or their adaptation to labour so far as that improvement was caused by the change. It was sometimes supposed that loss would be prevented by a change in the proportion of the employed. Though, no doubt, a certain increase must be expected when the change occurred, still, if they looked at the causes of the want of employment, they would find that they were not of the kind that this change could tend permanently to remove, and they could look forward to no gain from that cause; and, as had been said, the disorganisation of the industry would largely operate in the opposite way. As to the question of the adaptation of capital, he thought the most important suggestion was the double shift. He had always been interested in the question whether great gain in the efficiency of labour might not come from more extensive use in manufactures of the double shift, and if the introduction of the normal week took place he should hope for some compensation in that way.

Mr. G. G. W. Balfour, M.P., replied to some of the arguments advanced by Mr. Sydney Webb.

Mr. John Leech remarked that the curtailment of the hours of labour must inevitably enhance the cost of production, it being generally conceded that a limitation of the hours of labour would not be accompanied by a corresponding reduction of wages. The cost of the articles produced would be increased, and that would in all probability have a serious effect upon our foreign trade, and also upon our home trade. With our present system of fiscal arrangements we should be compelled to receive from foreigners a great number of articles for home consumption that we now supplied ourselves, and we should be unable to export to

foreign nations many goods we now made in consequence of the increased cost. Unless we could arrange that the hours of labour in foreign countries should be limited to the same as in our own country, we should be at a great disadvantage.

Mr. R. H. Inglis Palgrave said it was probable that some persons there had had the price of gas raised in consequence of the increased cost of production. He happened himself to be interested in that manufacture, and to the great regret of those concerned in the management, within the last few days the price of gas had had to be raised, simply and solely in consequence of the rise in the cost of production.

Mr. J. H. Levy said that Great Britain was a country that carried on its trade to a much larger extent with the use of capital than other countries; that was to say, the production of our goods was much more that of capital than of labour. Now, if they proceeded in the way that Mr. Sydney Webb would have them do, they would increase very largely the cost of production of the articles into which labour entered, while they would not increase in the same way the cost of production of the articles into which capital entered, and that would have the result that manufacturing industry would receive a considerable impetus at the expense of our agricultural industry, and our land would still further go out of cultivation. It would be a bad thing if this were brought about by any such artificial means as an Eight Hours Bill passed as an Act of Parliament.

Mr. Stephen Bourne remarked that he longed for the time when eight hours would become the privilege and right of labour in this country. Although he had been accustomed for fifty years of his life to do a larger amount of labour than that himself, he believed that eight hours a day was quite a sufficient period for a man to be employed at work; but any legislative enactment to insist upon these reduced hours would simply produce such a derangement of economic arrangements at home as would absolutely destroy a very large amount of our foreign trade. To his mind, the tyranny which Trades Unions was exerting over a large number of the labouring population of our country was forcing them to take measures which were contrary to their real interests.

Professor Munro having replied, The President, referring to some tabulated statistics in Prof. Munro's paper, asked whether they would believe that in this civilised country the Government had hitherto positively refused to attempt to collect industrial statistics. This was the only civilised country absolutely devoid of these figures. What they wanted was an expression of public opinion in favour of the Government providing the few thousand pounds required for an Industrial Census Department, organised on economic grounds, and managed by economists or by men of business. The establishment of such a department would bring about a gain to the country very much greater than the trifling amount it would cost. Proceeding to discuss points raised by Professor Munro, the President said that the fundamental weakness in the argument of those who favoured a reduction in the hours of work was that it would raise wages, and he had also seen it assumed that one effect of the change would be to diminish the number of unemployed. He did not think there was any evidence of that. They would require clearer evidence than they had as to how many men there were unemployed who were willing to work or capable of working. And he should wish to exclude those men who, having grey hairs, were not worth to the employer the full Trades Union wages for the district, and who were, therefore, prohibited by their Unions from working. He believed that if the Unions would allow men who had become old, and were, therefore, not as efficient workmen, to work for less than the standard wages, a great deal of wrong would be remedied. With regard to foreign trade, he thought foreign competition was important in this way,—if we were to work less, and consequently to endeavour to make capital content with a lower rate of interest, capital would, so far as possible, and to a very great extent, migrate to other countries. If, however, the reduction were universal, it would be avoided. From that it might be admitted that an international movement would be easier than a national one; but that was nearly all he was prepared to allow in the argument that foreign competition was a bar to a

reduction of hours of labour which was not universal. A change in the hours of labour which did not disturb the relative values of things would not disturb foreign trade. Looking at the question generally, he should put it in this way,—a reduction of the hours of labour would in most trades, not in all, diminish the output. Part of the loss would be thrown upon the capitalist. If the change was introduced spasmodically, it would disorganise labour, but if it was introduced gradually capital would bear a little more diminution of income than labour. If a reduction from ten hours to eight had the effect of diminishing the output by 20 per cent., he thought it probable that the day's wages would fall something less than 10 per cent. if brought about gradually, the rest being borne by capital. The question arose whether it was worth while, and it was one incapable of any universal solution. He could not admit that eight hours was too long for anybody to work. Much of what was called work he should call looking on. As regarded the children, he was of opinion that factory legislation had not gone anything like far enough. Children should not leave school as early as they did at present. Such a tax on the community as would be necessary if children were kept longer at school would diminish the incomes of the present generation but slightly, and it would increase them in the next generation tenfold.

#### THE MARBLES AND ORNAMENTAL ROCKS OF THE MEDITERRANEAN.\*

WHILE the waters of the Mediterranean Sea are opalescent, abounding with fish of the most exquisite colours and hues, and with sea-weeds equally beautiful, the rocks which surround this basin sea, along with those of its islands, are equally beautiful in colour, and have from the earliest times supplied nearly the whole of the valuable marbles used for the architectural adornment of the cities of Greece and Rome, and if we only include a moderate inland belt of the coast line within the watershed to this sea, we can then call almost every fragment of ancient marble found in Greece and Rome and their colonial cities Mediterranean marbles.

The classic Greeks may be considered the pioneers in the working of marbles, the origin of which is easy to understand. White marble was the stone most easily obtainable in large sizes for architectural purposes, and no doubt this choice material, which was capable of taking and retaining the most delicate chisellings with its ivory-like tinting and semi-transparency, played its part in the refinement of both architecture and sculpture in the ancient world, and it is possible that the outcome of their refined colour-decoration may have been in great measure requisite to subdue its dazzling brightness under an Eastern sun.

The Romans, in their turn, endeavoured to obtain lasting colour in their buildings by the introduction of coloured marbles, which the Greeks had all but neglected, the result of which introduction was the magnificent colour-decoration of Rome and Byzantium, the influence of which has continued through all architectural changes and styles down to the present time.

The demand is now so great for varieties of choice coloured marbles, not only for architectural decoration, but for articles of vertu and furniture, that not only has search been made for the various quarries of the ancients (all of which except one have been discovered), but hundreds of new ones have been opened and worked in every part of the explored globe. In the midst of all this modern adventure, the ancient quarries of the Greeks and Romans on the shores of the Mediterranean still retain their pre-eminence.

Greece has her white-marble quarries at Mount Pentelion; these supplied the material for the Acropolis of Athens and the Pantheon of Rome; those of Paros produced the finest material for sculpture, and also, in my opinion, the marble for Herod's temple at Jerusalem. Several of the islands also produce good white marbles, and in all these white formations are found every variety of greys. The Cipolinos were quarried chiefly at Carystus, from whence were taken the monoliths for the temple of Antoninus and Faustina in Rome. These are the largest marble columns known.

\* By Mr. W. Brindley, F.G.S., F.R.M.S. Read before the Geological Section of the British Association Meeting at Leeds, 1890.



The beautiful Verde Antica green porphyry comes from near Sparta, and the green marbles from the shores of Magnesia, Thessaly, and Tinos.

The Rosso Antico have all been refound on the coast between Cape Matapan and Gythium.

The grand quarries of Porto Santo are still workable at the island of Chios; black marbles are found in several places, and varieties of pavonazetto at Skyros.

The famous quarries of Synada, in Asia Minor, which supplied Rome with her monoliths of Favonazetto's marble, were found last year. There are sixteen quarries of immense size, alongside of each other; these are about to be re-worked.

Between Smyrna and Ephesus are white marble quarries, but the most important blocks used for the Temple of Diana, at Ephesus, came from Pentelicus or Paros, although some may have been taken from Samos.

At Tarsus are quarries of ivory white marble, from which the Temple was built. All the white marble used in Egypt came from the Mediterranean.

History tells us little about the old quarries of Greece, but the architectural remains of Greek and Roman cities show plainly that their produce was enormous; eight-tenths of the white marble found in Rome is Greek; and the quantity of worked material recklessly burnt as lime for centuries must have been enormous.

Byzantium was chiefly built with the marbles of the Sea of Marmora; and these quarries are still worked for Constantinople; and most likely this sea takes its name from being really a marble basin.

The produce of the quarries of Egypt brought down the Nile for Roman use may be called Mediterranean, the most valuable of which were those of imperial red Porphyry; these are now being re-worked, the first important consignment of 270 small blocks having this last month arrived in London, the remains of ancient working on some of these blocks being most interesting, showing that they not only wedged, scabbled, and chiselled, as is now done, but that they even sawed blocks of this hard material asunder.

The Breche Verde of Egypt, the granites and oriental alabasters, were all extensively worked and floated down the Nile for shipment to Rome and other cities.

Ancient Numidia (now the eastern portion of Algeria and the west of Tunis), produced the Giallo Antico; these quarries are very extensive, the Romans having quarried right through the mountains; from here came the yellow monolith columns of the Pantheon in Rome, and those of the Arch of Trajan, now re-used in that of Constantine.

At a number of places along the Algerian coast are ancient quarries of rich coloured marbles, chiefly reds and yellows; from those of "Cape Chemona," near the ancient Julia Cesarea, the capital of Mauritania, was brought the rich red marble (rouge Etruscan) used for the decoration of the new rooms and staircase at the National Gallery, London. Further west, at Kleber, near Oran, there are the famous quarries of Sig. Del Monto; these marbles are unquestionably the richest (as regards reds and breccias of red, yellow, and browns) that have ever been discovered in any part of the world; they are now largely used in America. The Algerian onyx marbles are found near Oran, and red ones have recently been discovered at Guelma, in the west of Algiers. The Mediterranean coast of Spain for thirty miles inland abounds with marbles of every colour.

There is first the sparkling crystalline statuary of Macael with which the Alhambra was built, the rosy veined of Tarragona, the rich Brocatellos and jaspers of Tortosa, the red and orange blended Brocatellos and onyx of Malaga, the Grotto deep reds, blue Turquin and fossil of Gevona; also the precious green Serpentine of Granada, which has scarcely a rival in richness of colour and firmness of texture. Many of these were worked by the early Romans and Moors.

On the French Coast are quarried a number of deep and light reds and brecciated yellow.

The ancient quarries of Lunl, now Carrara, are at the present day the most renowned in the world, and considered, with the adjoining ones of Massa and Seravezza, to cover an area of 27 square miles. The marble rocks commence a little above the sea-level, and extend up the mountain to an altitude of 7,000 ft., the

whole of the sides and valleys of these mountains being studded with innumerable quarries, giving employment to 15,000 people, the result of whose labour supplies probably 90 per cent. of the white marbles used in the world.

These quarries were known and worked by the Romans, and have been worked continuously since before Christ, but the immense development has taken place within the last fifty years, or we might even say the last thirty years.

Probably no single individual has visited the whole of these quarries, not even interested residents. To see and examine them all would take an entire season.

The most valuable marbles of the Appennine range are those of Mont Altissimo, at Seravezza, situated at an altitude of 7,000 ft.; here the most beautiful and durable statuary is found in immense beds, masses being extracted of the purest quality containing thousands of feet cube, the value per foot being 2*l.*, or even more; single blocks worth 500*l.*, each are often obtained, and occasionally up to 1,000*l.* This marvellous mountain of Altissimo produces also a statuary grained marble of blueish tint, nearly the whole of which is sent to France for statuary purposes, as it is extremely durable for exterior work. The famous coloured breccias of grey, red, and purple, the Rhodona, Toir de Perchia, and others, are found here in large masses, also the blue-veined Bardilio and a Cipollino. The promontory of the Gulf of Spezia (Porto Venere) is one massive rock of black and gold marble. Near Genoa are the quarries of Green serpentine limestone; the one containing red spots is called in commerce Egyptian.

Similar marbles are found in Corsica, also the purple-veined (Fior de Persico), and a rich mixed green and amethyst coloured granite used largely in the Medici Chapel at Florence; the orbicular granite (Napoleonite) is also obtained from this island.

Between Sienna and the coast there are the rich quarries of Sienna yellow (this beautiful marble is not found in ancient Rome). At Volterra, near this coast, is obtained the pure white Italian alabaster; and at Prato, the deep olive-green serpentine used so extensively at Pisa and Florence.

At Mount Rommola, near the coast, are ancient quarries of statuary white. Sicily contains several good marbles. Near Trappini, on the west, the choice jasper marble is obtained, also the rich coloured sileceous jaspers.

At Tauromena are quarries of reds and browns. The rocks of Brindisi and those of the opposite Adriatic coast, up to Istria, are a fine-grained white limestone; this is the stone with which the Venice palaces are built, the white sort being the Palamino, found in Mosaic pavements. East of Trieste a useful red marble, like the Brocatello of Verona, is worked very extensively.

I hope, in conclusion, this short but very imperfect summary may give some idea of the money wealth in the Mediterranean rocks.

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##### KNOLE HOUSE.

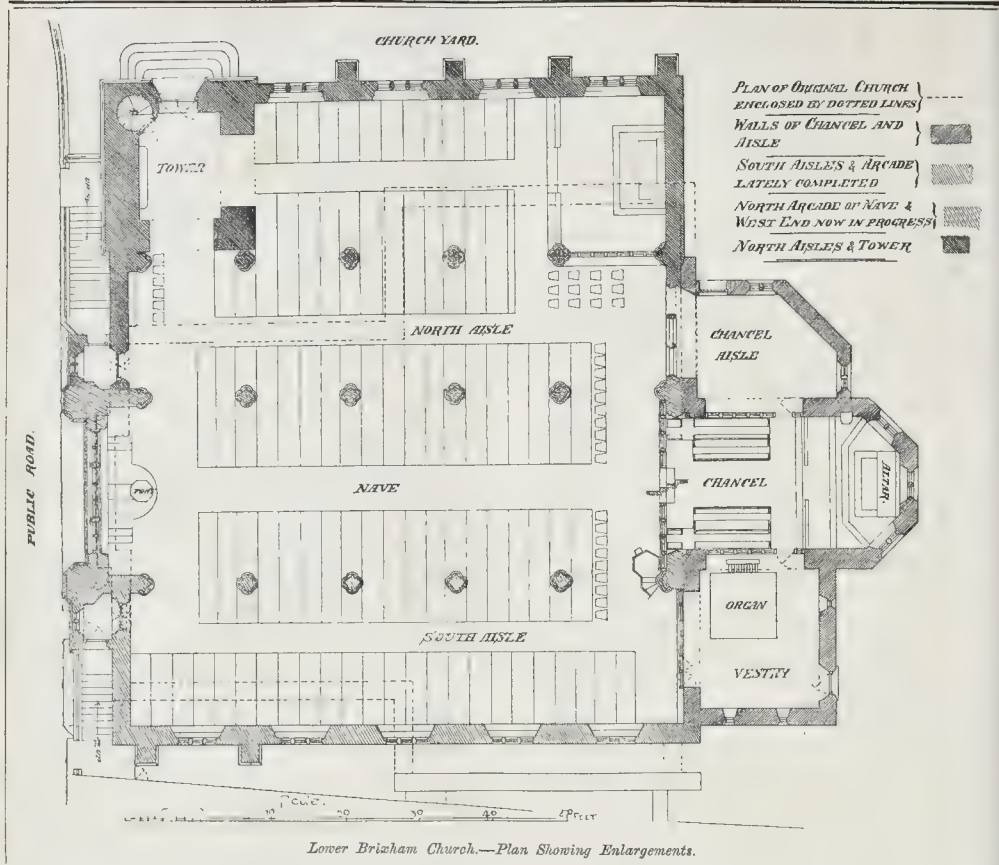
THE fifth vacation visit was made on Saturday last to Knole House, the seat of Lord Sackville, when a party of over thirty members visited this remarkably fine and interesting Elizabethan and Jacobean mansion. Knole appears to have been a notable manor-house from very early times, and for a considerable period was associated with the Archbishops of Canterbury, by whom it was used as a country seat, together with their palace at Otford. Knole was bought for 400 marks by Thomas Bouchier, Archbishop of Canterbury, in 1456, from William, Lord Saye and Sele, the son of the Lord Treasurer, who perished in the insurrection of Jack Cade. Archbishop Bouchier rebuilt the house and enclosed the park, and possibly some of the ruins which are situated to the east of the mansion may have formed part of Bouchier's work, besides what remains of it in the present building. Archbishop Morton, successor to Bouchier, enlarged the house and received there as guest King Henry VII. Henry Dean and William Warham, successors to Morton, resided occasionally at Knole, Warham in particular having there several times entertained Henry VIII. In the days of his successor, Cranmer, however, the

spoliation of the Church had been begun by Henry and his courtiers, and the Archbishop was therefore under the necessity of giving up Knole together with other possessions of the See in order to save the remainder. The house and manor belonging to the King, he then bestowed them on John Dudley, Earl of Warwick, afterwards Duke of Northumberland; on his attainder in the first year of Queen Mary the property reverted to the Crown, and she granted it to Cardinal Pole, and at his death, in 1558, it again came into the possession of the Crown. Elizabeth presented the Manor to Sir Robert Dudley, afterwards Earl of Leicester, but he again surrendered it to her and she then bestowed it upon Thomas Sackville, first Earl of Dorset, who came to reside here in 1603, and constantly employed two hundred men upon alterations, and repairs until his death in 1608; it is, therefore, in the highest degree probable that it was during these years that the greater part of the existing features of the house were carried out, and the character of the work would certainly bear out this assumption. For a time, owing to the extravagance of Richard, grandson of the first Earl of Dorset, the property was sold to Henry Smith, Alderman of London, whose benefactions to various parishes in the counties of Kent and Surrey are of a very considerable extent. By his trustees, however, the property was again sold to Richard Sackville, Earl of Dorset, nephew to the former, in 1661, since which time it has continued in the possession of his descendants. The present title of Baron Sackville was revived in 1876 in favour of Mortimer Sackville-West, brother of the present Peer.

Architecturally, the main features of the plan are the two great quadrangles, one behind the other. Entering the first by the carriage entrance, and noting the horn lanterns and silver maces, one receives a foretaste of the distinguishing characteristic of Knole, its richness in old furniture, decorations, and accessories of Jacobean and later periods. In the outer quadrangle are replicas of ancient statues, a gladiator and a Venus, *orta mari*. From the outer to the inner quadrangle the entrance is below a massive tower which forms the central feature of the principal front of the outer court. Fronting us as we enter the inner quadrangle is a colonnade, evidently a later addition to the outer wall, and through this we enter the house and reach the great hall, still the important feature of the interior, whose dimensions are 74 ft. 10 in. in length, 27 ft. in width, and 26 ft. 8 in. in height.

The screen through which we enter, and the minstrel-gallery over, decorated with the arms of the first Earl of Dorset and his Countess, is a good example of the Jacobean treatment of this feature, but loses all charm by reason of its having been "painted four times in good oil colours, grained wainscot, and twice varnished," the wainscoting and other woodwork of the hall having shared the same fate. Even the fireplace has been "grained imitation marble," which, however, throws into stronger relief the high character of the beautiful workmanship of the fire-dogs, which, we are told, were brought from Hever. The principal staircase, one only of the sixty or eighty said to be in the house, has likewise suffered from the attentions of the eighteenth-century painter and decorator, which detracts much from one's enjoyment of the really pleasing design and arrangement of its planning. Remembering the effect of Hatfield, Audley End, and other houses of this period visited lately by the Association, it is pitiable to realise how much charm has been lost by the vagaries and vandalism of vehicle and varnish. In passing through the principal reception rooms, the richness of the house in fine pictures is especially noticed, as when we find, for example, that the Crimson Drawing Room is completely hung with works of Sir Joshua Reynolds, any one of which would make an ordinary man proud. Tapestry, too, of somewhat late date it is true, but exquisite in design, execution, and preservation, meets our view repeatedly, notably in King James' Room, and in the Chapel. The collection of ancient silver also, in King James' room and elsewhere in the house, is remarkable both for its design and its intrinsic value. The number of ebony and other carved cabinets would in themselves signalise many a museum of ordinary size, while ancient Oriental carpets and rugs, hangings and upholstery of costly embroidery, and other rare and valuable bric-à-brac, afforded the visitors a treat which





will not easily be surpassed. Even the attics, to which the party penetrated, proved a mine of wealth in decayed and decrepit specimens of household goods which form a veritable history of domestic furniture for the last three centuries. To the architect, the picture lover, and the enthusiast in bric-à-brac few of the stately homes of England offer greater attractions than Knole House, which through the generosity of the present Baron Sackville is once more open to the inspection of the curious,—at a florin a head.

### Illustrations.

#### THE OLD BRIDGE AT PRAGUE.

**T**HE old bridge at Prague, which has been so seriously (though, we trust, not irreparably) injured by the overflowing of the Moldau is, without doubt, one of the most valuable structures of its date and class in Europe. It is one of the very few, if not the only example, of an important fourteenth-century bridge with its towers and gates complete. In addition to this, this venerable bridge claims our attention upon other grounds. From an architectural point of view it is most valuable as being the work of one of the greatest Medieval architects whose name has been handed down to our day.

There appears to be sufficient documentary evidence to establish the fact that when the Emperor Charles IV. commenced this bridge, in the year 1357, he appointed Peter Arler, of Gmünd, as his architect; there were two members of this family, brothers, who have left a great reputation—Peter and Henry. Peter erected the cloistery, transept, and lofty spire of the cathedral at Prague. The spire, which is said to have been the highest ever erected, was destroyed by lightning in 1541. The Wenzel Chapel, attached to the Cathedral, the

Rath-Haus at Prague, the churches at Kolm, Brun, and Nordlügen are also attributed to Peter Arler. Henry became still more famous; he erected the magnificent church of Holy Cross at Gmünd and, under the Italian appellation of "Enrico di Gamodia," furnished the plans for the Cathedral of Milan.

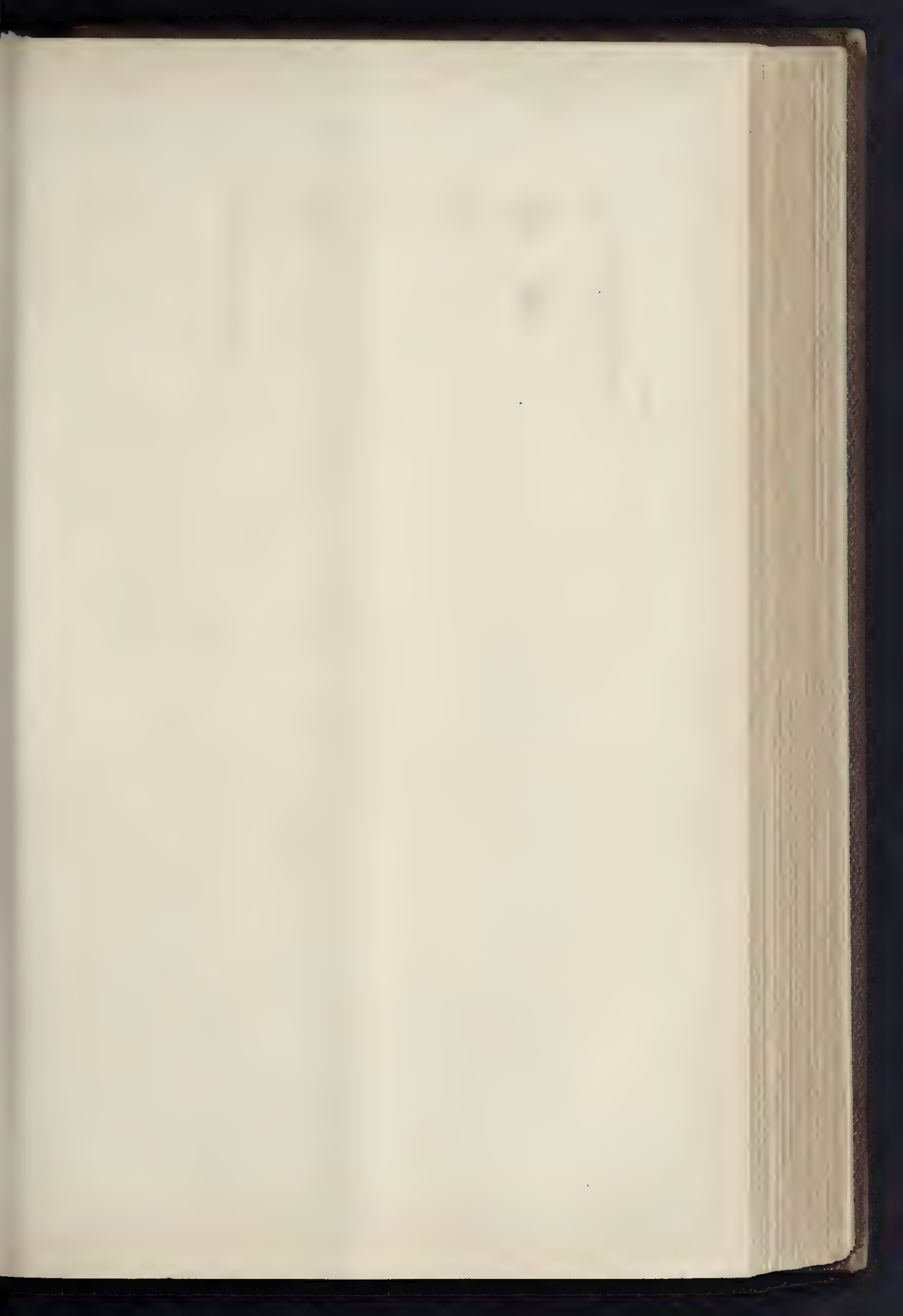
The bridge at Prague appears to have been carried on slowly, even for a Mediaeval work. The beautiful tower of the Altstadt, called the "Albstädter Brückenthurm," which is shown in our view, was not completed until 1451, and the bridge itself was not entirely finished until 1503. There can, however, be no doubt that the bridge was in use long before that time, as John Nepomucine was thrown from the parapet into the water in the year 1383. The great monuments which stand upon the piers of this bridge are, with one exception, comparatively modern; that exception is the so-called "Old Memorial Column" (Alten Denksaule), which is adorned with Gothic panelling and angels holding shields, and on the summit is the statue of a knight in full armour, whose head and shoulders have unfortunately disappeared. A large group, representing the Crucifixion, was erected in 1668, and the bronze statue of St. John Nepomucine, the only really valuable piece of sculpture on the bridge (with the exception of that attached to the Altstadt Tower), in 1683. The bridge itself is 1,572 ft. long, 33 ft. broad between the parapets, and, at its highest point, 42 ft. above the water-mark when the river is in its normal condition. The widest arch is said to be 69 ft. span, but this may be doubted; it certainly does not look anything like so much. As in all ancient bridges, the piers are immense in proportion to the span of the arches. There are sixteen of the latter, though they do not all cross the water, as there is an island which intervenes between the two banks. The bridge is not straight in plan, but makes two deflections—one very slightly to the south just beyond the third arch from the east end, and the other very decidedly

to the north. It is not easy to account for this peculiarity; it may have arisen over some difficulty in the foundations of the piers. The tower, which is shown in the foreground of our view, stands upon a great pier between the first and second arches; it is an exceedingly fine piece of design, and is, in all probability, for the greater part, the work of Peter Arler, because the cognizance of the Emperor Charles IV., the bear, is represented upon the finial of the canopy over the archway, and that emperor himself is portrayed as standing upon a pier between two arches of the bridge.

It is very rarely that one finds a Mediaeval example of military architecture so elaborate as to its detail. Yet not only was it intended for purposes of defence, but it has borne a very important part in the constant battles of which Prague was the scene during the fifteenth, sixteenth, and seventeenth centuries, and as late as 1648 the Swedish army battered and besieged this gate for six weeks, which accounts for the fact that the front towards the bridge has been deprived of all its decorative features, whereas that towards the Altstadt is, as shown in our view, very rich and elaborate. The gateway leading to the "Kleinseite" is quite different in design; it consists of an embattled portal, flanked by towers of different height. It is far plainer than the Altstadt Gate, though its bracketed turrets and upper story are adorned with well-designed arcades and niches.

It is not very easy, at present, to say exactly what damage has been done to the bridge by the recent floods. Accounts are contradictory, and until some competent authority has examined it it is impossible to say what repairs are rendered necessary, and how much of the structure will have to be taken down and rebuilt. We trust, however, that the Austrian Government will take such steps as are necessary to save as much of the old bridge as is possible, and will immediately commence such engineering works in connection with the river itself, as will prevent the recurrence of a calamity which

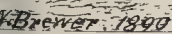






THE OLD BRIDGE AT PRAGUE PAI



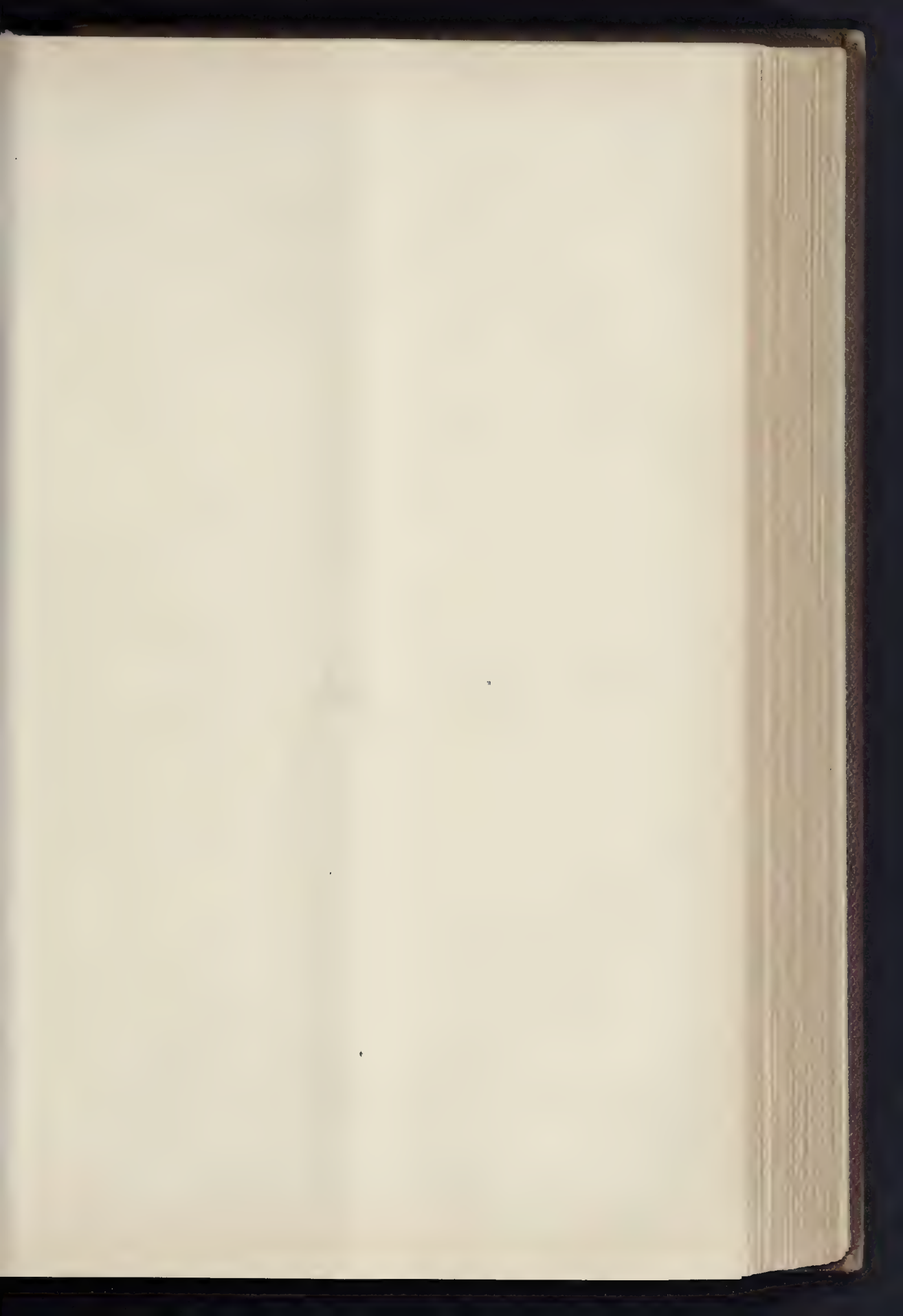


PHOTOGRAPHED BY THE U.S. AIR FORCE PHOTOGRAPHIC CENTER, RANDOLPH AFB, TEXAS

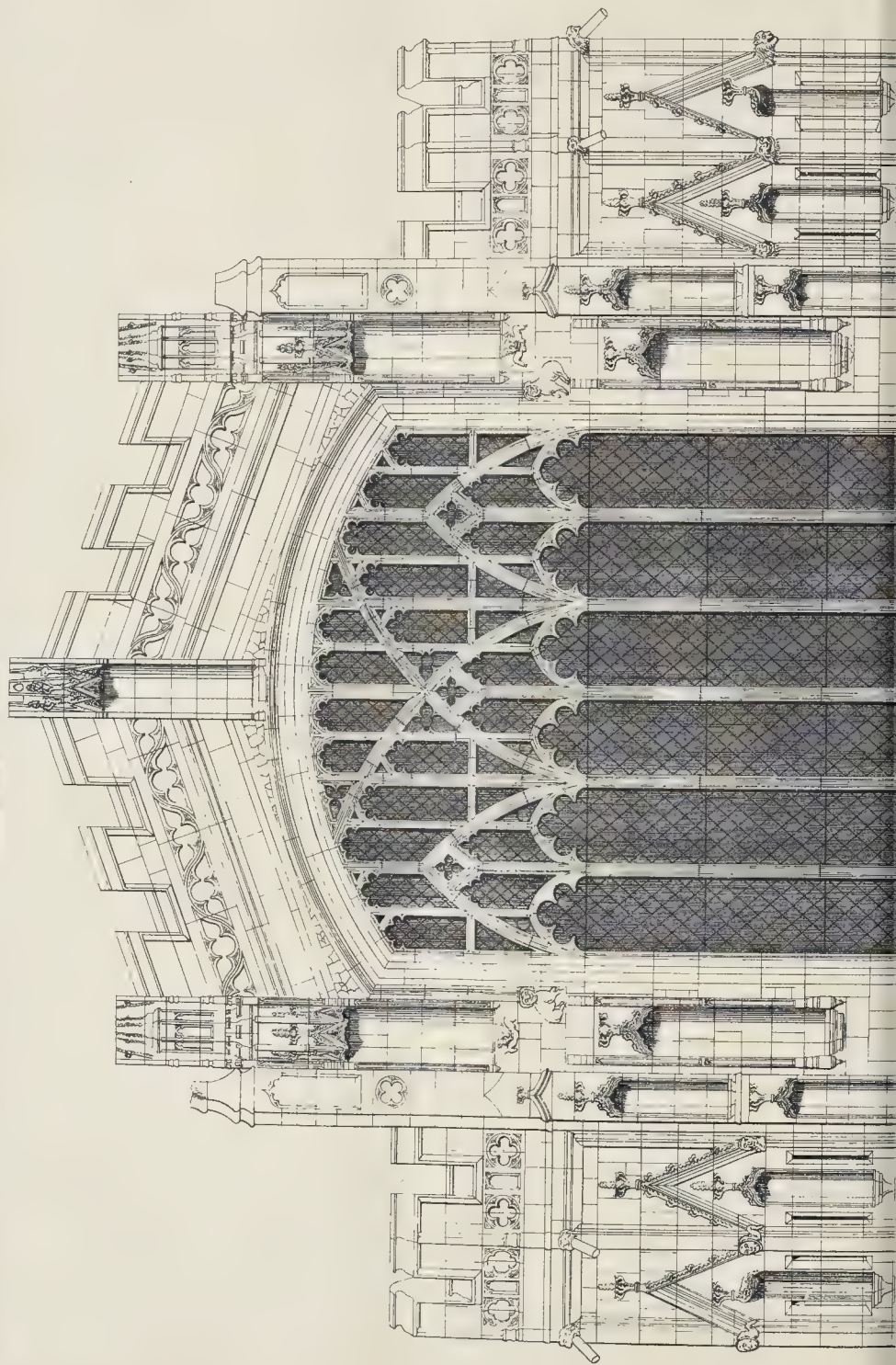
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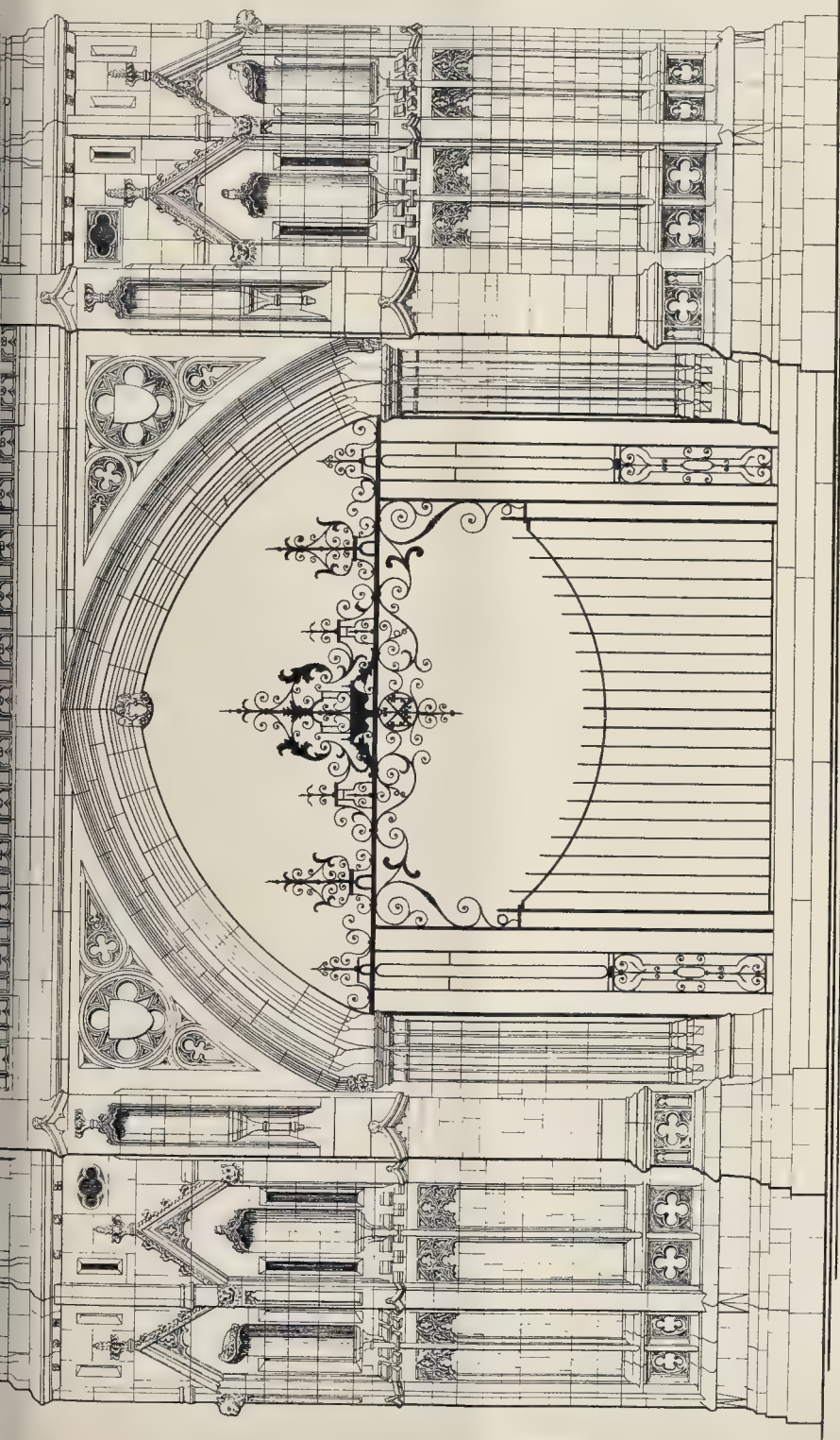




THE BUILDER, SEPTEMBER 20, 1890







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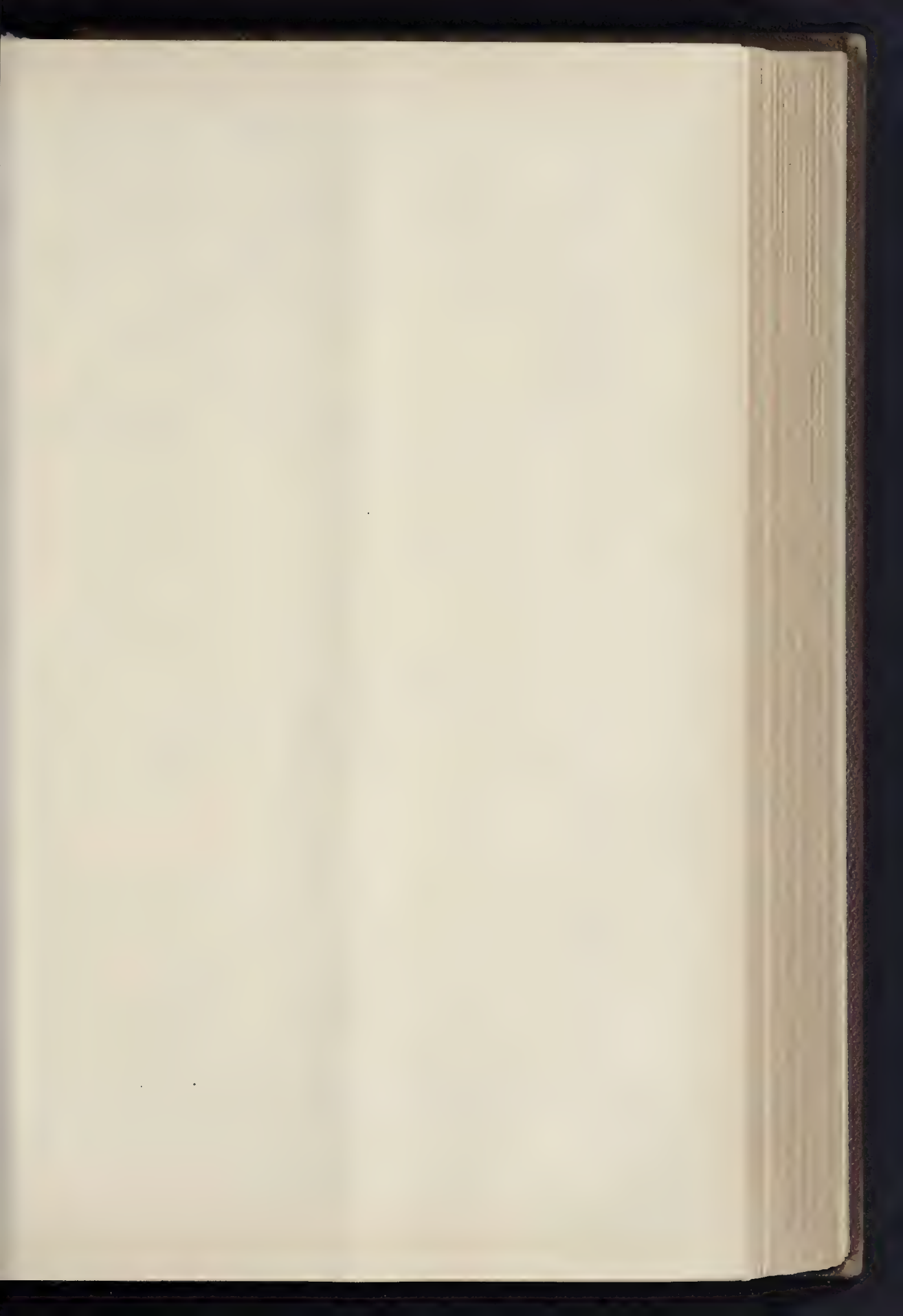
PHOTO. THE SPENCER & CO. 22 MARTIN LANE LONDON, W.

PORCH, WEST FRONT, PETERBOROUGH CATHEDRAL.—MEASURED AND DRAWN BY MR. G. G. IRVINE.

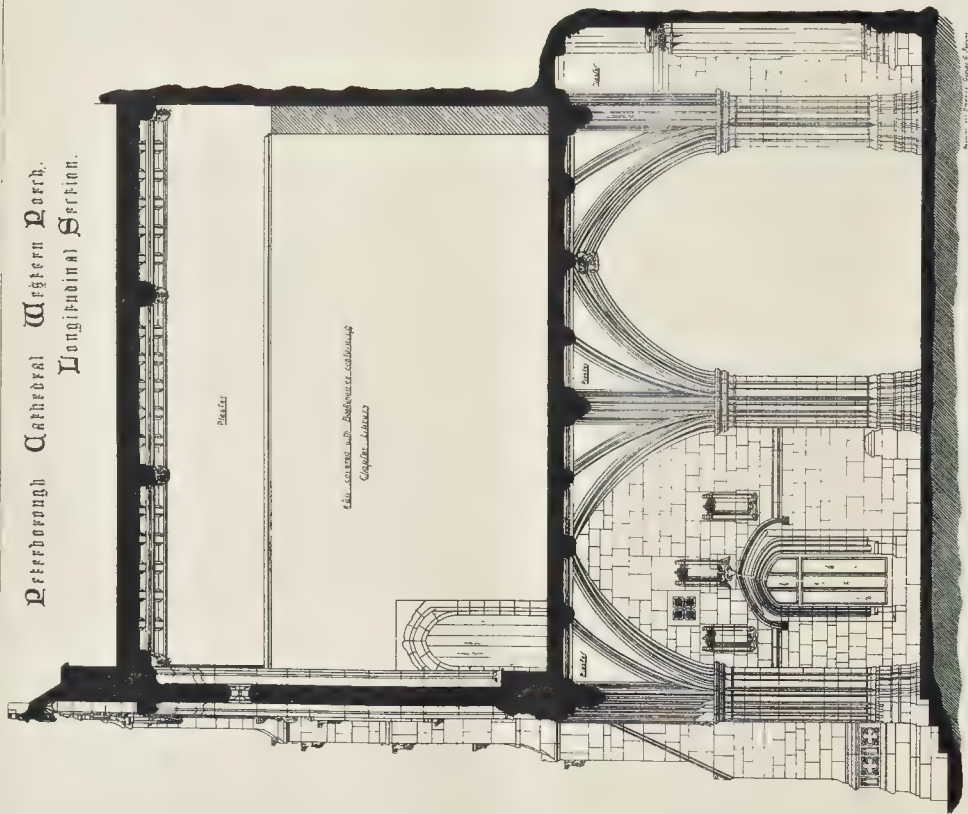
FRONT ELEVATION.



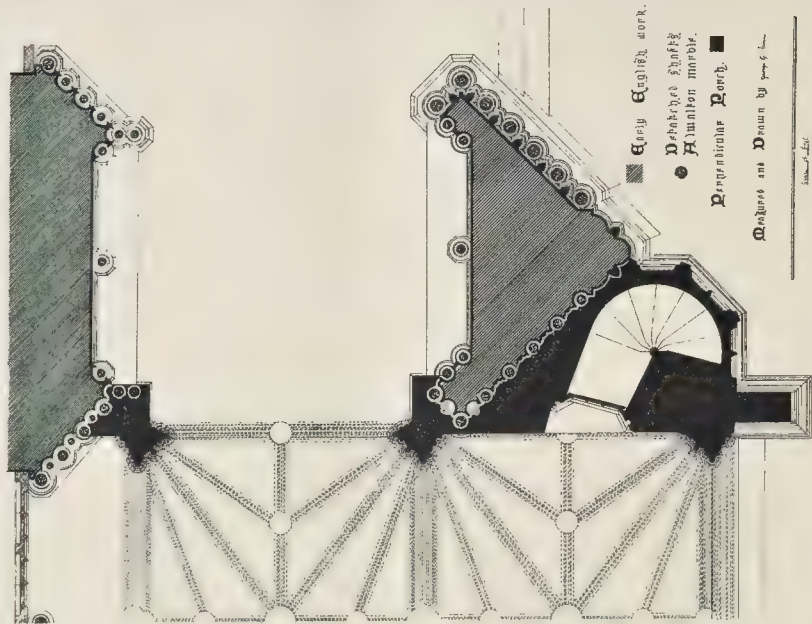




# Peterborough Cathedral Western North. Longitudinal Section.



## Western North Plan



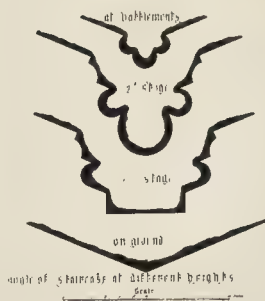
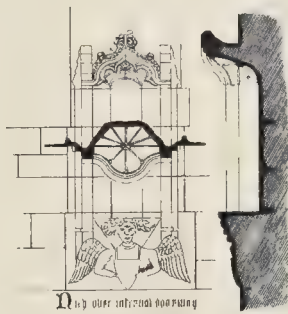
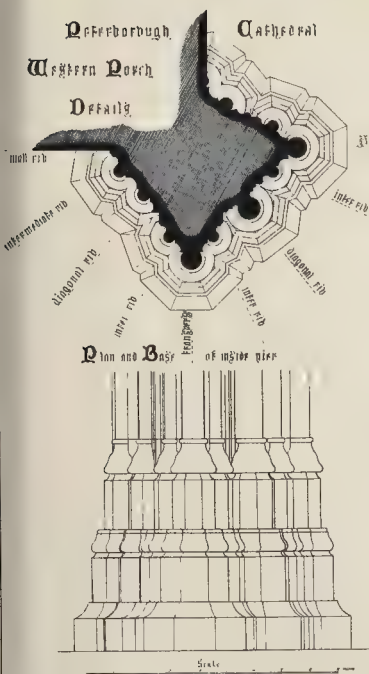
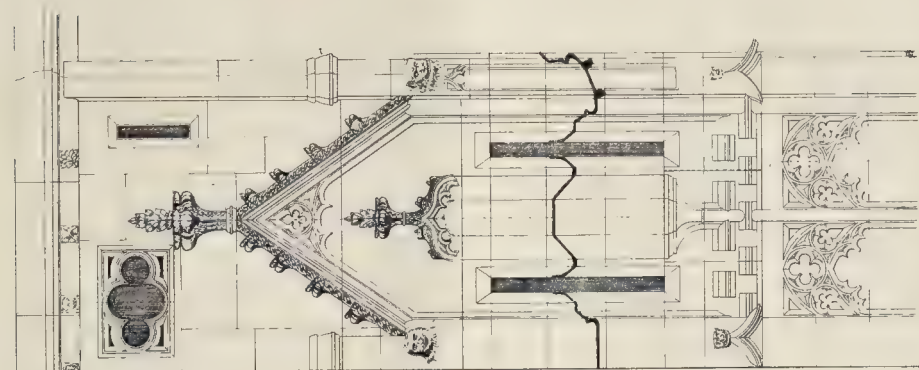
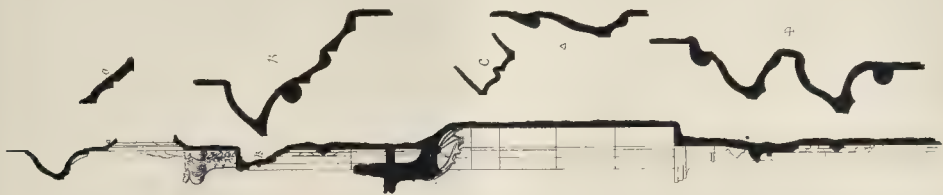
Scale of Feet

Legend:  
 ■ Heavy English work.  
 ● Decorative finish.  
 ■ Roman masonry.  
 ■ Perpendicular North.

Designed and Drawn by J. H. St. John

Scale of Feet

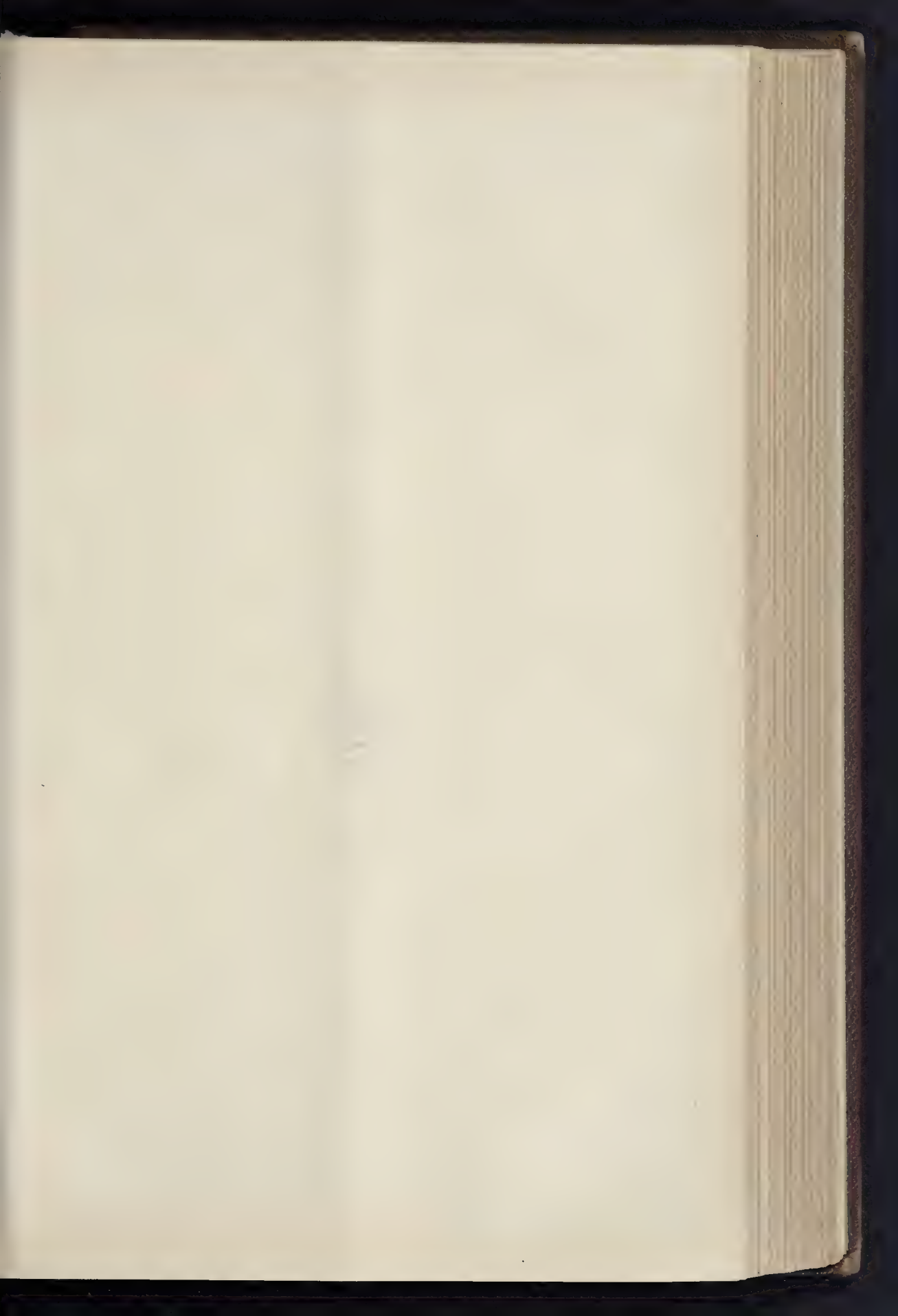




Measured and Drawn by G. G. Irvine.













INTERIOR OF THE PARISH CHURCH LOWER  
BRIXHAM SHEWING NEW NAVE & AISLES.

MR Somers Clarke & MR J.T. Nicklethwaite Architects





has caused so much destruction all over Bohemia.

We should mention that our view, in addition to the bridge, shows the Church of St. Francis, immediately to the right, which, although founded in the thirteenth century, was entirely rebuilt in 1672; in front of this stands the modern statue and monument to the great Bohemian emperor, Charles IV. On the opposite side of the river are seen the part of Prague called the Kleinseite, or "Little side," and rising above it is the "Hradschein," crowned by the palace of the emperor and the houses of the Austrian and Bohemian nobility. The great dome-crowned church is that of St. Nicholas in the Kleinseite, originally built in 1283; it was rebuilt from 1673 to 1774. To the right of which is seen the thin spire of the Church of St. Thomas,—a thirteenth-century building, but completely modernised; and to the left, over the bridge, rise the stunted towers of the Church of the Knights of Malta, rebuilt in the year 1503. On the top of the hill, to the right, are the spires of the Premonstratensian Priory of Strahow, the church of which is a very plain Romanesque building, commenced in 1140. It contains a fine organ with fifty stops and 3,177 pipes. The library of this monastery,—the most ancient in Prague,—contains 50,000 volumes: attached to it is a large picture gallery and a hospital. Crowning the hill to the left, called "Laurens Berg," are the twin spires of the Church of St. Lawrence; but, as this has been taken possession of by the military authorities, it is closed to the public, and the writer was unable to inspect it, which is to be regretted, because the chapels attached to it are adorned with a series of pictures by Furich, which are said to be fine examples of the modern German school of religious painting. The more interesting old churches of Prague—the cathedral, the "Tein Kirche" (the chief Bohemian Church), and the Benedictine Church of "Kloster Kmmaus"—lie out of the range of this view.

H. W. BREWER.

#### ALL SAINTS' CHURCH, LOWER BRIXHAM.

EARLY in this century the increase of population made it desirable to separate the old parish of Brixham, and to serve the "trawlers," a rectangular box, some 75 ft. long and 40 ft. wide, was constructed in Lower Brixham. This was covered in with a queen-post roof, and ceiled flat at the level of the ties, about 27 ft. from the floor.

This building was enlarged by transeptal projections, with two stories of galleries, and is shown on the plan by the dotted lines. About twenty years ago, a mean little chancel with aisles was constructed.

The site selected for the church falls so rapidly down the channel to the end of the nave that, whilst the floor of the latter is 10 ft. above the road outside, the eaves of the former are level with the surface of the hill.

It was determined in 1883 to rebuild the nave, but to retain as far as possible the number of seats given in the old church and galleries. It being impossible to burrow further into the hill-side, or to lengthen the nave by encroaching on the road, the necessary floor space had to be got laterally. The funds in hand did not admit of the work being carried out at one time, and it has consequently been necessary so to plan the work that the old building should be left and used in conjunction with the new. The first work was the construction of the south arcade, and when the roof was supported by it, the old outside wall was pulled down, and a new one built, completing the south aisle of the future church. This aisle is constructed of local blue limestone from Berry Head. The arcade and other internal stonework are of Ham-hill stone, the window tracery and other stone on the exterior are from the Doulting quarries. The aisle thus formed is 18 ft. 3 in. wide clear internal measurement, and the part of the roof about 27 ft. high. The roof is of iron joists and concrete by Drake & Co., covered with Claridge's asphalt. The concrete is ceiled underneath with boarding and moulded ribs.

The work now to be undertaken is the construction of the north arcade of the nave, still leaving the old queen-post roof, which will not be removed until later on. The west wall, suited to the pitch of the intended nave roof, is also now to be taken in hand. This contains a seven-light window with flowing Decorated tracery.

The north wall of the old church will still be left standing, as there are not sufficient funds in hand to admit of the aisles being finished at once.

When the nave is roofed the existing chancel arch,—a very lean and unsatisfactory work,—will be masked by a new wall and arch, which will carry the gable end of the nave roof.

The internal width of the church, when finished, will be 84 ft. 9 in. by an average length of 75 ft.

The church is designed by Messrs. Somers Clarke & J. T. Micklethwaite, of Westminster.

#### PORCH, WEST FRONT, PETERBOROUGH CATHEDRAL.

THE unique design of the Cathedral front is too well known to require much explanation. It is the supposed work of Abbot Acharius or Zachary, 1200-1210 (prior of St. Alban's during part period of the erection of John de Cella's front there). The plan presents features much akin to those of the foundations Sir George Gilbert Scott laid open at St. Albans. Peterborough front, when close to completion, underwent both reduction of height and considerable change in design. Its great piers are supplied abundantly with delicate shafts of local "Alwinton marble," obtained from the property of the Monastery, at a village of that name on the south bank of the Nene, in Huntingdonshire. (It is somewhat lighter, but perhaps more durable than Purbeck.) The pillars are triangular in plan, with the point to the front. Of their courses scarcely one can be found to be entirely of a single depth or layer of stone; they are in fact *random ashlar*, differing from all else in the church, and suggesting that the masons were limited to dealing merely with older re-used materials. The natural settlement of such work soon produced that tendency outwards of the upper part of the front, which portends its eventual destruction. So serious has this become at the close of the Decorated period, that the Monastic body procured the original of the design afterwards erected as here drawn, but which the Abbots appear to have delayed as long as they possibly could. Hence the earlier design appears in Perpendicular clothing, though the peculiar gables of the first style are to be discerned on the stair turrets, and the architectural student may otherwise find interesting study of this conflict in the earlier sections of the cape of the vaulting shafts of the inner bay, with those of the outer shafts of the west arch. The top of what is now left of the pinnacle over the apex of the gable, retains part of the hollow prepared for a lamp to be placed in at night.

The following entry appears to refer to the space under the open arches, prior to the erection of the porch:

"In 1347, Simon de Sapcot, executor of the last will of John de Blakketort, of Walcot, in the parish of Bernak, gave his best horse as" (or in payment for) "a mortuary in the place called Galilee (*in loco qui dicitur Galilee*). Reg.: Fraunceys, p. 219.

The very beautiful ironwork filling in the west arch of the porch is not older than about the year 1792, when the following entry in the audit-book of the Chapter occurs, but without any further notice of designer or place of manufacture:—"3rd day July, 1792. It is also agreed that the timber now standing upon our estates at Thorpe, on lease to the Earl Fitz William, be sold in order to pay the expense of the new ironwork in the Minster porch."

G. G. IRVINE.

#### ANCIENT BRITISH ROADS AND EARTHWORKS.

AT the recent congress of the British Archaeological Association, held at Oxford, Dr. Phéné, F.S.A., read a paper "On some striking Historical and Linguistic Features, belonging to the first 1,000 years of British History, and attaching to the Vicinity of the British Roads and Earthworks." Dr. Phéné pointed out that in all the literary descriptions of the ancient and pre-Roman roads of Britain, there were two important omissions, one as to locality, the other as to language. That he had discovered the absence of such information in long practical researches as well as in the localities, in comparative linguistic derivations.

The description given by Cæsar of the inhabitants of Britain was as true a picture now as it was when he recorded it, viz., that the maritime people were polished, as being well

acquainted with other nations in traffic, and the pastoral people uncultivated.

Though the Anglo-Saxon race now occupied the greater portion of the land, some of the Gallic people (*i.e.*, the pastoral) still occupied the north-western coasts, mountains, and islands.

These latter were just as Cæsar described them, as to their unmaritime dispositions, and the press, and great men of the North-West, as the Marquis of Lorne, urged their attention to the people of the East coast, (*i.e.*, maritime loving people, as good examples to follow, on many points).

In short, though the numerical proportion now differed widely, the population might be divided into those engaged in some way in or for maritime matters, as manufacture for transport, &c., and the land-loving people of Celtic descent.

He then examined the localities of the great pre-Roman roads of traffic. The Icknield Way from west to east, and the Watling and Ermine Streets from south to north, along the eastern coast.

It was shown that although modern names and meanings had succeeded many of the ancient ones both in English and in Scandinavian, yet that most curious linguistic features still existed along these routes, distinct from other localities, and that a class of words abounding in Cornwall, and found slightly at intervals along these roads, were as abundant in what was once the country of the Iceni,—*i.e.*, on the coast of the North Sea,—as they were on the south-western coast; that not only were they abundant at the two extremities of the ancient Icknield Way, but that where, from the names of the places, there was evidence of any locality having been specially marked, either as a resting-place, or as a place of reverence or worship, there they also abounded, though in a less degree.

Quoting from Cæsar, Strabo, Tacitus, Florus, Quintilian, &c., it was shown that the Continent must have had similar ancient roads—as Cæsar enumerates many bridges over many rivers—and that from the large concourse of merchants he summoned, the commercial feature must have been powerful before Britain was invaded by him, and hence that the British ways must have been in use for traffic; that the names and words referred to showed extensive intercourse throughout these districts, and extended along the east coast up to the Humber, and even farther north; that by a curious mutation of the B and W, letters mutative in ancient and modern Greek, in ancient and modern Welsh, &c., the same names and words, though existing unaltered at these extremities and stations on these roads, abounded also in the same proportion, or nearly so, with the mutative initial changed, and that this appeared to arise not merely from the letters being mutative, but from the custom of the Scandinavians of placing a letter or syllable as a prefix, to indicate their localisation to the east or west, as is prominent in the words Visi or Western Goths, Ostro or Eastern Goths, and that consequently the W, and sometimes the U, was placed less as a mutative letter than as indicative of locality; and that the Iceni, when in the west, were known as the Wiccii, and sometimes as the Uicci, which latter word was aspirated.

The localities of rest, and also of worship, were found in every case in the vicinity of the great chalk-out figures along these ancient roads, and their intersecting roads, as identified by the names still existing in their localities, and the clustering around them of names and words which only sparsely existed along the mere lines of route, as Is-lip, near Oxford, Is-ham, in Leicestershire, Is-ton (though corruptly aspirated), near Cambridge, Is-field, in Sussex, Is-leham, in Essex, Is-lington, in Middlesex and in Norfolk, Is-leworth, &c. This word, always in low-lying districts, was simply the old Norse word, "is" (ice), which became an important feature in their winter warfare and their winter traffic, and as recorded, *inter alia*, by the attack on Ely by the Barons opposed to King John was the sole means of their victory.

Again, Ris-borough, near Oxford, was found along these routes, as Ris-Ingtho (ho being Scandinavian for hill), Ris-by, Ris-bury, Ris-ley, Ris-burgh, Ris-ingles, &c. This word Ris is "guest-ris-inn." And the Ris-borough near Oxford, that is at the village of White-Leaf, is further shown to be the place of rest on this route, not only from its being midway in the Icknield road, but from the name itself—"lig"



and "leaf," spelled by us leaf, being the old Norse for rest, remainder, &c.

Several curious and interesting words were dealt with, as Gamlingay, Warmingay, and Bellingay, all places of worship, around which clustered other words, not British, Roman, or Saxon, but Scandinavian.

It was further shown that the most remarkable events in ancient British history had taken place in the localities indicated by the nomenclature referred to. The first battles which subdued Britain to the Romans, Saxons, and Normans having been fought in the sacred territory of Anderida, a name that occurs solely in Phenician routes of traffic as Androna Andropolis, Anderitum, Anderitum, Andros, &c.; that near Hoke-Norton (Hogg-Ormur), close to Oxford, are the Roll-rich stones, where Rollo, conqueror of Normandy, with the Northmen, persistently held the country by obtaining decisive victories over the English: that the Norman conqueror William, when in contest with the Barons, again raised his standard on one of these ancient camps, near Hoggington (Hogg-Ormur, near Cambridge), in the former district of the Iceni, indicating its then still existing importance; that the Romans had to contend with a people from Scandinavia, against whom they established a special guard on the coast, and in Anderida in particular; and that the nomenclature and traffic strongly indicated a pre-Roman-Scandinavian occupation of South and East Britain.

#### ARCHAEOLOGICAL SOCIETIES.

**ESSEX ARCHAEOLOGICAL SOCIETY.**—The annual general meeting of this Society was held at Harwich on the 28th ult., being preceded by a gathering at Ipswich on the previous day, in union with members of the Suffolk Institute of Archaeology. At the conclusion of the general business, the Rev. H. T. Armfield, M.A., F.S.A., read an able paper "On some ancient boulders scattered in the district of the Colnes." In the afternoon an excursion was made to various churches, that of St. Nicholas being first visited. Dover-court Church, and Wix, Ramsey, and Great and Little Oakley were also included in the excursion.

**SOMERSETSHIRE ARCHAEOLOGICAL SOCIETY.**—The forty-second annual meeting of the Somersetshire Archaeological and Natural History Society was held on the 27th ult. at Castle Cary. In the absence of the President, Mr. George Fowkes Luttrell, the chair at the Council meeting, which took place in the Town-hall, was occupied by Mr. Chisholm Batten, who, having briefly opened the meeting, proposed the election of Mr. Henry Hobhouse, M.P., as President for the ensuing year. This was agreed to, and Mr. Hobhouse then took the chair. The Hon. Secretary (the Rev. J. A. Bennett) then read the report of the Council for the year, which stated that the number of members was steadily maintained. The MS. collections of the late Rev. Frederick Brown had been deposited in the museum, and would be known as the Brown collection. The subject of the formation of local branches of the society had been dealt with by a Committee, and rules circulated for the guidance of local societies. One branch, called the Northern, had been established within the district comprised in the petty sessional division of Long Ashton. The report having been adopted, the President delivered his opening address, which was of much interest. On the second day, the 28th, excursions took place to Lyte's Cary, West Camel Church, Queen Camel Church, Sparkford Hill Quarry, Hazelgrove House and Park; and on Friday, South Cadbury and North Cadbury House and Church were visited. The proceedings were reported at considerable length in the *Bristol Times and Mirror* of the 28th, 29th, and 30th of August.

**ROYAL SOCIETY OF ANTIQUARIES OF IRELAND.**—The Ulster quarterly meeting of this Society was held on the 2nd inst. in the Town-hall, Strabane. Among the papers read was one by Mr. S. F. Milligan, on "The Forts of Erin from the Firbolgs to the Normans." A long report appeared in the *Belfast Newsletter* of the 3rd inst.

**NEWBURY DISTRICT FIELD CLUB.**—This Club had recently a pleasant excursion to Aldermaston, Upton, and Silchester. Aldermaston House was visited by permission of Mr. Higford Higford. The antique carved staircase, removed from the old mansion after the destructive fire forty-seven years ago, attracted much attention, as did some old stained

glass showing the armorial bearings of some of the families which have held the manor. Aldermaston Church was visited, under the guidance of the Rev. J. M. Guilding, who called attention to the Foster Tomb, the Jacobean pulpit, and the old glass. Mr. Walter Money, F.S.A., hon. sec. of the Club, read an interesting paper descriptive of the mansion, and of the descent of the Manor. Upton Court was next visited, by the permission of Captain and Miss Sharp, and here the party were met by Mr. W. A. Boulnois, who pointed out some of the most noteworthy architectural features. The hall ceiling was, he remarked, a good example of the kind of plaster work introduced into England after the Renaissance in Italy, and subsequent to the reign of Elizabeth. The house as it now stood dated from between 1610 and 1680, but the Gothic of the earlier building was imitated, and a good deal of the material used. Fortunately Upton Court had fallen into most appreciative hands. Proceeding to Silchester, the party visited the excavations now in progress there, Mr. G. E. Fox, Mr. Mill Stephenson, and Mr. W. H. St. John Hope acting as ciceroni and explaining the remains recently brought to light. Mr. St. John Hope, in the course of his remarks, said they were dealing not with a camp or a villa, but with a large city, with an area of 100 acres. The wall was as nearly as possible perfect in its ring all round, though the facing was gone, except in a few places. The city was divided into blocks or *insulae*, and one of the questions to be solved was what these blocks contained. Were there shops facing the lines of streets, or did the *insulae* contain the remains of large residences or temples? That question had not been answered either at Silchester or at any Roman site in Britain. Other Roman sites had been built over, but at Silchester there was an opportunity of investigating the whole area. When, however, it was remembered that one *insula* was 400 ft. square, or larger than the site of some of our cathedrals, it became evident that the turning over and trenching was costly work. The Society of Antiquaries had made a handsome grant, and Dr. Freshfield, their treasurer, had undertaken the exploration of one *insula* at his own expense—he hoped others would follow his laudable example. Mr. St. John Hope concluded by describing the work at the *insula*. There were signs that at each corner were large houses with gardens, though the remains were very shattered. In the course of the discussion which followed, Mr. Money said it had always struck him as rather singular what had become of all the materials of such a vast city, but Mr. Guilding had, he believed, discovered that some of the materials had been employed in the construction of Reading Abbey, while he had himself discovered some Roman bonding tiles at Padworth Church. This led to the belief that for centuries the ruined city had been a quarry for materials for building churches and other structures. The party also visited other portions of the remains, including the amphitheatre, and the south and west gates. A long report of the meeting appeared in the *Reading Mercury* of the 6th inst.

#### Books.

*Building Construction and Drawing.* By CHARLES F. MITCHELL, Lecturer on Building Construction at the Polytechnic Institute. Part I., First Stage, or Elementary Course. London: B. T. Batsford, 1889.

THIS is the second and revised edition of a work previously noticed in these pages.\* The author has corrected some of the blocks, and made some additions to the text, which include the examination paper of the Science and Art Department for 1889, with the questions arranged as exercises, in the order of their difficulty, on the subjects dealt with respectively in the chapters of the book. The additional matter amounts to some three pages, the body of the work being, with slight exceptions, page for page the same as in the first edition. Without wishing to find fault we must call attention to one or two points that might have claimed Mr. Mitchell's attention while the work of revision was in progress. For example, throughout the chapter on masonry, we find no warning against the practice of working stone to a feather-edge, while feather-edged

springing stones, which could easily have been avoided, are shown in a diagram of a relieving arch at fig. 124, page 49. Further on, in enumerating the various materials of which cramps are made, there is no mention of galvanised iron. In the chapter on girders, there is a section of a flitch girder (fig. 152, page 55) in which the iron flitch is shown of equal depth with the timber, whereas it should, of course be less, in order to avoid the danger of an uneven bearing surface, resulting from the shrinking of the timber. The statement on page 62, that riveted girders are considered more economical than rolled joists for depths exceeding 12 in., is, as it stands, misleading. The pains taken to explain, with a profusion of diagrams, the bonding of brickwork, are deserving of all praise; but in actual work, closers are not treated quite in the manner shown on page 25.

In the chapter on joints in carpentry, descriptions are given of joints for struts and beams, applicable chiefly to the feet of principal rafters abutting upon tie-beams. The descriptions are accompanied by good, practical diagrams, such as abound throughout the work; but it would have been better if more care had been taken to point out why some modes of construction are preferable to others. For instance, at pp. 81, 83, is explained the bridle-joint, in which the heel-strap is formed like a stirrup, with two eyes, and is secured by a bolt passing through the middle of the tie-beam. The bridle is employed, as the author states, to increase the shearing area of the beam; "besides which," he adds, "any defect in fitting is easier to discover." He omits to inform his readers of the disadvantages of such a fixing, such as that any considerable strain upon the bridle tends to enlarge the bolt-hole, and may even cause a split in the beam; or that the bridle cannot be tightened except by wedging behind the foot of the strut. Apparently Mr. Mitchell is somewhat partial to the bridle-joint, for he shows it repeatedly in illustrations of roof details, as if it were one of the best means of fixing, instead of being one of the worst. He refers to a diagram showing an excellent form of heel-strap, with ends forged and screwed, which pass through bearing plates to which they are secured by nuts, but he neither shows nor describes the check plate, sometimes employed for preventing the strap from cutting into the underside of the tie-beam. In several cases, also, the foot of the principal, instead of being framed with a tenon in the ordinary way, is left square and let into the tie-beam, a process which necessitates cutting into the latter for its entire width to an unnecessary portion of its depth.

In treating of the leadwork on roofs the author figures the width of the part of the lead lining of a gutter turned up under the slates by a measurement on the slope. It would have been better had he laid stress on the fact that the lead must be taken to a sufficient height measured vertically. One of the points most commonly lost sight of by young draughtsmen is that the width required is greater upon a flat pitch than upon a steep one.

Notwithstanding these slight defects, which are pointed out with a sincere desire to assist Mr. Mitchell in perfecting his book, the book is a useful and even valuable one for the student. It would be pleasant reading if what in our school days used to be called the definite and indefinite articles were not so frequently omitted; and it would certainly be improved by the expurgation of some grammatical errors, of which the following is perhaps the most glaring:—"Iron cramps put in hot and surrounded by asphalt is recommended by Gwilt as for ever to preserve them from oxidation" (p. 52).

That the book should so soon have reached a second edition is encouraging to its author, and the reduction in price will tend to popularise it still further.

*The Student's Guide to the Practice of Measuring and Valuing Artificers' Work.* Originally edited by EDWARD DONSON, Architect. Revised, with considerable additions, by E. WYNDHAM TARN, M.A., Architect. Sixth edition. Crosby Lockwood & Son, 1889. It is painful to speak ill of a venerable acquaintance, but candour compels the conclusion that no sufficient reason exists for the production of a sixth edition of this book, at any rate in its present form and with the title it now bears. It might be aptly styled "A Book about Building"; but a guide to the practice of measuring and valuing artificers' work it certainly is not.

\* See *The Builder* for December 29, 1888, vol. LV., page 476.



As London is said to be full of men who know everything except how to get a living, so these pages contain something that is sound and useful on almost every subject connected with building, but nothing that is thorough and full enough to be of real value to what the preface quaintly calls the "rising student."

Indeed, the fatal fault of the book is that it attempts to do far too many things at once. In no one volume could a writer deal with all the subjects here taken in hand. Squaring dimensions, mensuration, building terms, building construction, dilapidations, ancient lights, contracts, are all treated of in a book of 326 pages, of which some fifty are taken up with a carpenter's or timber merchant's ready reckoner. A half apology is even offered for the absence of an account of the manufacture of building materials as well! At the same time there is some unnecessary detail. Thus we have, "Looks are mechanical contrivances for securing doors when closed" (p. 207). The "rising student" cannot have risen very far who requires to be told this.

Our readers will readily infer from the foregoing that the authors leave themselves but little room in which to play their title rôle and teach the art of preparing quantities, and measuring and valuing builders' works. Oddly enough, too, the attempt to do this is the least satisfactory part of the book. The profession of quantity surveyor, as now understood, has probably come into existence since this book was first written, and the methods of measurement have greatly changed. On page 312 we are told that "the whole of the work of each trade should be taken off before proceeding with the next trade." The authors rightly remark that the rules laid down by London surveyors "are superior to any others that can be adopted," and we venture to state that the practice above described has been abandoned by them for many years. A modern surveyor for taking off a window, for example, would certainly not pay it more than two visits; at the first deducting the brickwork and the facings, and measuring the lintel, arches, stone dressings, and everything else requisite to form the opening, and at the second taking the joiners' work, ironmongery, and glass, and deducting the plastering. It is obvious that although this method throws more labour on the abstractor, it is both more expeditious and less open to error than the other, possessing in addition the advantage of great convenience in adjusting variations at the end of the works.

Passing from this to the various trades in detail, let us take one example, and consider the rules given for the measurement of masonry, which is the branch of his profession presenting most difficulties to the student, and in which he needs all the help he can get. Here the book before us is hopelessly out of date. "Plain work" is a term not now used as synonymous with labour to beds and joints; nor is "sunk work" the same thing as "sunk joint." The voussours of an arch are not usually measured as less than the full size of the smallest stone square every way that each one can be cut out of. Steps are seldom measured except by the foot run. In the rare cases in which they are cubed and the labour taken it would hardly be fair to the builder to measure the length by  $\frac{1}{2}$  in. as sunk work to pay for the front and back rebates (p. 158). Six-inch landings also are given by the foot superficial, not cubed; and solid joggle by the foot run, not as a superficial measurement of sunk work. Similarly, to measure a stone coping feathering from 3 in. to 1½ in. as a cube  $\frac{1}{2}$  in. thick, or to cube up a 6 in. window-sill and take the throat as a superficial of sunk work, would not be in accordance with modern practice. It is difficult to believe there ever was a time when measurements were so taken; but a "rising student" who should take out the quantities of stonework in this way now would speedily find himself in serious trouble with builders. The order of the items in bills of quantities (or what is here termed their "rotation") is, moreover, not correctly given. For example, in the smith and founder's bill it is not usual to mix up the cast with the wrought ironwork. Space will not admit of our entering into further detail: enough, however, has been adduced to show that this book is not a safe guide for the student of the art of measuring.

The instruction in valuation consists of a series of constants of labour expressed in decimal parts of an hour. These are for the

most part good as far as they go, but require amplification.

In conclusion, we are glad to be able to say a word of commendation. The explanations of building terms and the description of building processes are good, and the details of construction given in Appendix II. are excellent.

*Blackie's Modern Encyclopedia of Universal Information.* Edited by CHARLES ANNANDALE, M.A., LL.D. Vol. VII. Blackie & Son, 1890.

THE seventh volume of this dictionary takes us to the middle of the letter S, and we presume another volume will complete the work. The article on Rome is a very good one for the scale of the dictionary. Among the architectural subjects we find "Romanesque architecture" well defined (as far as it can be defined) in a brief article illustrated by an engraving of the Church of Lauch, one of the most typical examples which could be selected, and by a characteristic bit of Romanesque ornament. Roman architecture is also illustrated by a well-executed small view of the great hall of Caracalla's Baths, restored. The illustrations to the word "Roof" refer too exclusively to timber roofs, though the writer defines roof as the covering of any building, "irrespective of the materials of which it is composed." Saracenic architecture is briefly described with a notice of some of its principal structures and an illustration. In one of the articles pertaining to building, "Chirked moulding," the description seems at fault, and is rather vague. A quirk may be best described as a nick cut to throw out the form of a moulding which would otherwise die into the wall surface; a profile would have made it intelligible. This is a trifling matter, however; and in general we have been struck with the correctness and ability with which architectural subjects are treated in this dictionary.

*The Timber Merchant and Builder's Vade Mecum.* By GEORGE BOUSFIELD. Fifth edition, considerably enlarged and improved. London: William Rider & Son, 1890.

THE fifth issue of this work, useful alike to timber merchant and builder, has been enlarged by additional tables and rules, and carefully revised.

Many of the tables contained in this work are invaluable to those buying and selling timber, for making out accounts and checking them. In table 1 we have scantlings of almost every size, from  $\frac{1}{4}$  by 1, to 14 by 14, with the number of feet required to the Petersburg standard of 120 pieces 12 ft. long by  $\frac{1}{2}$  in. by 11 in., which is almost the only standard now used. In table 2 we have the number of deals, battens, planks, boards, &c., there are in a standard, from 6 ft. up to 25 ft. lengths; and in table 3 the prices per ft. at so much a standard, or per standard at so much a foot. Many retail timber merchants sell at profit, especially where they sell in small quantities, and this will be found very useful for this retail trade.

The French and English lineal superficial and cubic measures are given, showing the equivalents in either country, and there is a useful table showing the comparative prices per fathom and standard for fire- and lath-wood buyers. On pages 28 and 29 there is a table giving the price of scantlings (given in superficial inches) at per foot cubic. The table for calculating parts of a standard is one of the most useful in the book, and one that will save a great deal of time to those who use it. The book contains a variety of other useful tables for facilitating calculations of various kinds, as well as general information as to deflection of beams, spans of roofs, &c.; tables of the weights of different timbers, lists of exchanges in foreign countries, schedules of the brands of deals, information as to timbers newly brought into use, &c.

**VALUATION OF THE FORTH BRIDGE FOR RATING PURPOSES.**—The *Scottsman* says that Mr. Munro, the assessor of railways and canals, has valued the Forth Bridge for rating purposes at the net sum of £25,000. Against this valuation the railway company has appealed to the Lord Ordinary in the Bill Chamber. The company maintain that the boundary of each county ends at low-water-mark, and that, therefore, the bridge, so far as it is situated between the low-water-mark on each shore, should be exempt from rating for local purposes. Should the railway company's contention be well founded, the case will take the valuation of the Tay Bridge, the Solway Viaduct, and similar structures.

## Correspondence.

To the Editor of THE BUILDER.

### AN "EMPLOYERS' UNION."

SIR,—Will you allow us, through your valuable medium, to call the attention of the master builders and contractors, together with those engaged in the furniture, shop-fitting, and other affiliated trades, to the vital importance of organising, while there is yet time, a strong employers' union?

At present masters hold jealously aloof from one another, and trades unions attack them in detail, and often in a most aggressive manner, and no matter how unreasonable their demands, they are often conceded after a week's resistance, because no united stand is made.

A general meeting should take place and a chairman and committee be appointed, together with a thoroughly good paid secretary with clerical assistance, supported either by voluntary contributions, or a levy based on the annual wages paid by each firm. We believe it is the general wish that labour should have an equitable wage, indeed that the position of the working man should be improved as far as possible, due regard being paid to foreign competition, and a fair margin of profit being secured for the masters who take the responsibility and risks of the businesses which provide the opportunities for labour.

But at present the trades unions arbitrarily fix what they consider a proper wage, and, if this is not conceded at once, proceed to withdraw the men, taking care to attack only a limited number of firms at once (in case the strain on their resources should be too great), as witness the action of the French Polishers' Union just now. They then place pickets to "persuade" non-unionists not to "take the bread out of their mouths," and frequently add force to persuasion; or men who try to act independently are "spotted," and it is "made hot" for them wherever they go to work.

Such interference with personal liberty is, we contend, cowardly and immoral, and there is evidence that the law will put it down with a strong hand. It would be more to the purpose if the non-unionists had a little more pluck to carry out their convictions instead of being misled by the agitators who live on their dupes; for dupes they are, and if the present artificial and unequal-for raising of wages is persisted in (and only employers' amalgamation can successfully check it) the Nemesis must come in the shape of trade driven from the country and much increased importation of goods produced where the new Unionism has not yet found sway.

Will influential men come forward and help an Employers' Union for the Building Trades to take practical shape? CONTRACTORS.

### "A SANITARY NOTE FROM GREENOCK."

SIR,—I notice in your journal of the 6th inst. your correspondent, W. P. Buchan, referring to a "Sanitary Note" that I sent from Greenock, and which appeared in your issue of August 16 last, says that I attacked the Glasgow system of trapping and ventilating house-drains, and found fault with the Greenock officials for recommending drainage to be done in Greenock on the Glasgow plan. He further adds that I do not really find fault with the Glasgow system of trapping, but with the system in which the traps are ventilated. Now, I beg to state that the article referred to was neither intended to find fault with nor hinder sanitary reformers in their good work, but merely to state what is really being done, and to draw attention, particularly of parents, to the fact that the preservation of the health and lives of their children is a far more important consideration than that of any pecuniary gains of a few parties interested in the sale of traps or the repair of defectively-constructed drains. Your correspondent, "W. P. B.," goes on to say that he has no objection to siding with me in a general condemnation of the inlet ventilating grating being put directly over the traps, especially when these traps are on the pavement and close to the building, but that the complaint of bad smells from the grating can be easily cured without going to the expense of carrying up ventilating pipes to the roofs—viz., by putting an iron plate over the trap and then having the fresh air inlet a couple of yards or so to one side; that this has been a common practice in Glasgow for years, and if Greenock follow suit the ground for my complaint will vanish, "especially if the work is properly done." It matters little how well the work may be done. I fear the cure suggested would be an aggravation of the complaint by adding two yards more pipe, which would give a



greater volume of gas to eject on to the street every time that a bath or closet were used. The suggestion would no doubt save the pockets of proprietors, but would not lessen the danger to the lives of children. I observe that last month's "Sanitary Journal" still bears out the fact I formerly referred to, — viz., that the infantile mortality is highest in Glasgow, being 44 per cent. of the total deaths, and that where more is being done in the way of sanitary reform than in any other town in Scotland, in view of that fact, it would be dangerous to follow in the wake of Glasgow.

I have no hesitation in asserting that house-drains, if properly constructed, would outlast every other part of the building with but little or no repair. The almost imperishable materials now used in their construction make this an absolute certainty.

But instead of that, the drains are generally the most troublesome and expensive part of house property. This is, in a great measure, owing to the fact that the drains of a building are generally included in the mason's contract, and regarded by him as a branch of the work that may be done by the least experienced workmen. The contractor generally puts the lowest paid and unskilled of his men to do the work. It is not the men's fault, but rather their misfortune, that they have not had a thorough training to fit them for their task. However, I trust the day is not far distant when no man will be allowed to construct a house-drain unless he has passed a board of qualified examiners, and obtained a certificate that he has sufficient knowledge, both theoretical and practical, how to execute the work without the risk of leaving defects that are certain to produce disease.

Traps on house-drains are in many cases a necessary safeguard against danger resulting from defective construction. It is most desirable that all drains should be so trapped off from the interior of the dwelling that there can be no possibility of gases from them getting admission thereto. But to trap them so as to prevent the escape of sewer-gas above the main roof and make provision for the possibility of its escape on either the pavement or any other part of the street or court is a very questionable practice, particularly in such places as Glasgow or Greenock, situated as they are on a tidal river with a strip of level ground along its bank and rising ground in the rear, the outlet of the sewers being exposed at low tide, while at high tide the sewers in the level streets are filled with water, and there being no provision for the escape of gases at the upper extremities of the main sewers, they get so completely bottled up and compressed between the rising tide and the traps that they force their way through the water in the traps in streets, sinks, and closets in our dwellings. That this is the case I know from experience, having lately had to raise a case where it was proposed to make a connection between a property and a main sewer into which the tide flows; the sewer being so level that it is practically a long cesspool, the street having at frequent intervals to be opened at every 30 ft., so as to get the deposited contents cleared out. And, strange to say, of late the four-story buildings in the line of that street have had intercepting traps placed at the bottom of conductors which have no connexion with the building beyond the carrying of the rain-water from the roofs to the drains.

The local authority in their wisdom have sanctioned this, and no doubt with good intentions have also authorised the constructing and connecting with this long cesspool a new main sewer into a side street, over which new sewer several open gratings are placed to allow the gases to escape in the centre of the street, in preference to letting them escape above the roofs of the houses.

X. Y.

SIR,—In your issue of the 16th ult., you publish "A Sanitary Note from Greenock." In this there is a very palpable error. Your correspondent says:—"Of the total deaths in Glasgow, 45 per cent. . . . There is certainly some preventable cause at work that requires special attention, and until that cause is discovered and mastered, the fact that nearly half of the human beings born in these cities sicken and die before reaching the fifth year of their age, &c." The 45 per cent. referred to is of the total deaths, not 45 per cent. of the births.

I more particularly wish to enter a plea for what will, no doubt, be considered by many a retrograde movement in sanitary matters, viz., the abolition, except in a few very special cases, of that abomination—the syphon or intercepting trap. I read your articles on this subject in the "Student's Column," which contained many valuable hints, but all advocate the syphon. In the first place, the syphon is the most fruitful source of stoppages in house-drains; in the second place, it generally contains a certain amount of filth; and, thirdly, it shuts off all means of free ventilation to the sewers. This last is I am well aware, the desideratum of the persons advocating them; what this is for I fail to see in any locality in which the sewers are fairly well cared for by the Local Authority, as, in ninety-nine cases out of a hundred, sewers are in a far cleaner condition than house-drains. Sewers receive, in every well-regulated district,

special attention in the shape of flushing and cleaning by properly qualified sewer-flushers, and I have never come across a private house the drain of which receives periodical attention from any one. This, taken in consideration with the fact that in house drains there is only an intermittent flow, whereas in sewers the flow is continuous, gives a decided preference to the air in the sewers over that in house drains,—there should be no such thing as sewer-gas except in cesspools,—therefore it seems self-evident that the best system of house drainage is to have a free access from the sewer through the house drain and up the soil-pipe and ventilator, which should be of the full diameter of the soil pipe, and not a 2 in. pipe as is so often used. The fresh air inlet is very often the foul air outlet placed in a position most dangerous to health; the head of this inlet is frequently fitted with a mica flap, which is mostly out of order; if carried up to the top of the house at the same level as the ventilator, as is also done, the balance of the air in the house drain is equal on each end, and at a complete standstill, instead of a continuous current as it should be, and is where the sewer is ventilated by surface gratings in the middle of the road and the soil-pipes of all houses properly ventilated, without syphon in the house drain.

ERNEST VAN PUTTEN, Assoc. M.Inst. C.E.  
Leeds, September 4, 1890.

#### "THE GREAT TOWER FOR LONDON."

SIR,—Having seen your notice on the book compiled by me on the above subject, I wish to point out the following facts. You say the descriptions are "very incomplete." This must of necessity be the case when the authors of some of the designs either gave no description at all or else very vague ones. It could hardly be expected that I, as compiler of the book, should invent descriptions or supplement those so vaguely given.

The compilation of the book was well considered, and in regard to the inaccuracy of the cost of the design (No. 19), the fact that the author of this design has admitted that the figures given by him in his description were wrong, and which I was guided by, clears me of any blame. Had the author given the figures correctly they would, no doubt, have been correctly published in the Tower book. The figures in reference to Design No. 19 given in the Tower book are, at least, a correct addition of the several items given by the author, and there is nothing in his description to indicate that the sum of these items does not represent the total cost.

FRED. C. LIVING, A.M. INST. C.E.  
\* \* We must of course accept Mr. Lynde's statement that he did the best with the materials at his command. Indeed, in the last sentence of our notice, we suggested that the authors of the various designs had been "judiciously reticent in their descriptive notes." As to the error in cost of design No. 19, we had at first requested to publish a letter from Mr. Couchman pointing out that the fact is as we stated. Mr. Couchman, it is true, admitted a clerical error, in casting up, of a comparatively small amount (some 20,000l. or 30,000l., if we recollect aright); but he submitted to us his report sent in with his design, which, as we read it, showed that the amount of his estimate for the tower complete, including of course labour and materials, had been erroneously added by the compiler of the book in question to the amount of a separate estimate for labour and superintendence of construction only, thus adding about 800,000l. to Mr. Couchman's estimate. Mr. Couchman's tower, moreover, is (as we might have pointed out before) octagonal on plan, and not circular, as described in the book.—ED.

#### CAMBRIDGE UNIVERSITY ASSOCIATION OF BRASS COLLECTORS.

SIR,—As I have already been applied to for information about this Association by people who have seen the paragraph in last week's *Builder*, and as I expect to receive many similar applications, may I ask you kindly to correct in your next issue a mistake which Mr. Beloe unwittingly made in his short notice of the Society?

The subscription formerly was £s., but, owing to the rapid growth of the C.U.B.C., it has become inadequate, and therefore was increased to 10s. at the last general meeting in June.

R. W. M. LEWIS.  
Hon. Corr. Sec. C.U.A.B.C.

THE EDINBURGH AND GLASGOW AERATED BREAD COMPANY have erected extensive works at Glasgow, and which are fitted up with all the recent and modern improvements. The ventilation of these works has been carried out by Messrs. Baird, Thompson, & Co., of London and Glasgow.

A "PALIMPSEST" TOMSTONE.—Archæologists are familiar with "palimpsest" brasses, but if we may believe a writer in the *South London Press*, there is in Norwood Cemetery a tombstone erected to the memory of a Nonconformist minister which can only be described as a "palimpsest." The stone in question is stated to be considerably decayed, and it is added that "another name can be plainly traced" underneath that of the minister in question!

### The Student's Column.

#### HOT-WATER SUPPLY.—XII.

##### PIPES AND COCKS: continued.

APS.—There is, as every one knows, an enormous variety of these in the market, but, notwithstanding the many improvements and advanced ideas in this direction, a perfect tap, or a nearly perfect one, still remains to be introduced. There are numbers of these articles to be met with that display excellence of quality and careful workmanship and finish, yet it is doubtful if any maker is prepared to supply a 3-in. bib-tap for hot water, guaranteed to last more than twelve months without leaking, in a large residence where the tap is in fairly constant use—at the scullery sink, for instance.

The most usual form of tap to be met with, and one which is found to give fairly good results, is that having a plug through its centre and known as a plug-cock (fig. 21). These are made either with a nut bottom (a nut being screwed on to the plug at its lower end), as illustrated, or with a solid bottom, the plug being secured with a cap screwed on at the top, as fig. 22, this cap forming a stuffing-box; or

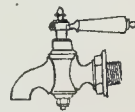


FIG. 21.

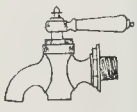


FIG. 22.

there is another with a solid bottom, the plug being secured by a plate at the top (fig. 23), this being called a "gland" tap. Either of the two latter are preferable to the former, as those secured by a nut at the bottom sometimes leak at that point, which is impossible with the others. These three are the forms of tap alluded to in a former paper as "quick-shutting" (in contradistinction to the slow-shutting screw-down taps), and which cause the concussive noise in the pipe when shut off suddenly where a good pressure of water exists. There is a very simple remedy for this, which will at the same time check the violent outrush of water experienced when a great pressure exists; this is effected by reducing the bore of the tap at what is called the "tail," the screwed portion that enters the pipe, as in fig. 24. This is quite

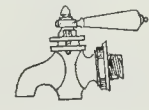


FIG. 23.

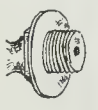


FIG. 24.

understood by the makers, many of whom keep these "checked" taps in stock. Workmen sometimes do this themselves by cutting a circular piece of sheet brass or zinc, and, after making a suitable hole in it, solder it on to the end of the tail.

Where there is a pressure of 15 lbs. to 20 lbs. (cold-water cistern situated 35 ft. or 46 ft. above the tap), the hole in the tail of the tap may be reduced to 1 in.; with a 10 lb. pressure a 3/4 in. hole is ample.

Screw-down taps overcome the concussion difficulty, by its being impossible to close them suddenly; but these taps, however well made, require "re-leathering" periodically, that is, the seating or diaphragm, whether rubber, leather, or composition, requires renewing somewhat frequently, and if the tap is not of good quality the thread of the screw-down arrangement wears or strips off quickly. This style of tap is now largely used, but it has an opponent in every servant that has to use it, as it cannot be opened or closed quickly, and in many busy houses a tap is oftentimes applied to a dozen or more times per hour, in which case the unscrewing and screwing usually leads to a loss of temper.

There is a modified form of this tap now being made which can be opened or closed in one turn, or they can be had to open or close with a half turn, which is as quick as a plug-cock; this overcomes the difficulty just referred to, but a new disadvantage is introduced with them, as when the abrupt thread of the screw-



down arrangement wears loose, a fair pressure of water will lift the seating slightly, and permit of leakage, and the thread of a screw-down tap is a troublesome part to repair.

It is now considered best, when purchasing baths or lavatory basins, to choose those that have the hot and cold taps fitted and attached to them, so that the connexion of the pipes to the unions provided is all that is needed to complete them. This is a much better and neater arrangement than having the taps projecting from the wall over the basin or bath, and it not infrequently happens, when this is done, that the hot and cold taps will be found of different patterns, as the hot and cold draw-off services are so commonly fitted up by different tradesmen (hot-water fitter and plumber). When the taps are fitted to the bath or basin by the maker they are sometimes placed out of sight, only the handles being visible, these having porcelain discs upon them marked either "HOT" or "COLD," and altogether a very superior result is effected with very little extra cost.

It has been the usual practice with makers, when supplying baths fitted with taps, to place the taps in question on, or nearly on, the rim of the bath, so that the water issuing has to fall about 18 in.; there is no objection to this with the cold-water tap, but with the hot tap it is an objection, as the falling hot water throws clouds of steam into the room, making it very unpleasant, particularly if the room be small. This objection is overcome by having the hot-water inlet situated near the bottom of the bath (not in the bottom itself), so that it is quickly covered with water, which prevents the steam arising; it is as well to have both hot and cold inlets thus situated, as the bath will then fill noiselessly.

This arrangement must not on any account be confounded with the method adopted in the old pattern zinc and copper baths to be met with, into which the hot and cold water issues through the waste grating in the bottom of the bath; the particular objection to this is that, when the bath is emptied after bathing, a certain amount of soapy, objectionable sediment is always left just in the waste outlet beneath the grating, and this substance is washed back into the bath by the inflowing water when the next person makes ready to bathe.

It is very desirable to have fair-sized service pipes carried and connected to a bath, and the taps should be as large as possible, say 1 in., as a slow-filling bath is as much a source of annoyance as one that empties slowly.

The majority of best quality and even many cheap-made baths are now fitted with the taps and with soap and sponge trays, all *within* the bath; this is an excellent feature, preventing drip water and soapy matter finding its way to the floor, or if the bath is encased it prevents the woodwork being injured from the same cause. When the bath taps are placed on the wood bath rim there is invariably a collection of dirt there, unless they are very carefully cleaned, and in this latter case the cleaning leads to the polish being rubbed off the woodwork and creating an unsightly appearance around the taps.

A very useful and not expensive adjunct to a bath is a shower apparatus; the old form of this appliance was a most inconvenient and troublesome thing, as it consisted of a suspended vessel or reservoir which had first to be filled before allowing its contents to be showered down; this, although cumbersome and unsightly,

The more modern form of shower attachment is as fig. 25, consisting of a board of polished wood (to match the bath casing) on which is affixed the hot and cold taps and the shower rose; the method of connecting the pipes is shown at fig. 26, which illustrates the back of the board. It will be seen how simply the temperature can be regulated, so that, if desired, the shower can gradually be made to vary from warm to cold, and the shower can be continued any length of time. A further useful adjunct which can be attached to the shower board inexpensively is a small tap with a nozzle, to which can be secured a piece of india-rubber tube, and this, if fitted with a rose, can be used either for shampooing purposes or for rinsing out the bath after use.

#### SURVEYORSHIPS.

**CHELMSFORD.**—Mr. Charles Law Green has been appointed Borough Surveyor of Chelmsford, in the room of Mr. Charles Portwe, resigned.

**CHELTHAM.**—Mr. Joseph Hall, C.E., the newly-appointed Borough Surveyor of Cheltenham, was at Torquay a few days ago the recipient of a testimonial, in recognition of the services he had rendered to that town as Surveyor to the Local Board during a period of nine years. The presentation was made by Mr. R. S. S. Cary, lord of the manor, and consisted of a Beck's first-class binocular microscope, with various powers (eyepieces, polariscope, &c.).

**MARKET BOSWORTH.**—At a meeting of the Market Bosworth Board of Guardians, acting as a Sanitary Authority, on the 10th inst., the Clerk read a letter from Mr. Horton, the Surveyor, stating that he had been appointed Surveyor to the Felixstowe Local Board, and asking that he might be released from his duties on the 26th inst. The Board accepted his resignation.

**YEOVIL.**—Mr. W. K. L. Armytage, Assistant Borough Surveyor, Preston, who is leaving Lancashire to become the Borough Surveyor of Yeovil, was the recipient of a present from the officials of the Preston Corporation a few days since. The presentation was made by the Mayor of Preston, on behalf of the officials, and amongst those present were the Town Clerk, the Borough Surveyor, Borough Treasurer, Medical Officer of Health, and other officers of the Corporation. The gift consists of a silver fruit-dish, embossed in high *repoussé* with fruit and flowers, and bearing the inscription:—"From the officials of the Corporation of Preston, to W. K. L. Armytage, Assistant Borough Surveyor, on his leaving Preston to become the Borough Surveyor of Yeovil, September, 1890." Accompanying the gift were several volumes of expensive technical works.

#### OBITUARY.

**MR. ANDREW M'KELVIE, C.E.**—News has been received in Dundee of the death by drowning of Mr. Andrew M'Kelvie, architect and civil engineer. He was making a trip on board a steamer, when he was washed overboard and drowned during a storm off Cape Hatteras, North Carolina.

**MR. CHARLES POOLEY, F.S.A.**, died on the 3rd inst., in his 74th year. He was a surgeon, but took great interest in antiquarian studies, and wrote a work on the Old Crosses of Gloucestershire and Somersetshire.

#### GENERAL BUILDING NEWS.

**PROPOSED PUBLIC BATHS FOR STAFFORD.**—At a meeting of the Stafford Town Council on the 12th inst., the Public Baths Committee recommended that for the purpose of obtaining competitive designs for the proposed baths, premiums of 25*l.* and 10*l.* should be offered for the two best plans sent in, and that the accepted plans should become the property of the Corporation. Mr. Matthews proposed the adoption of the report, and Mr. Flammock seconded the resolution. Mr. J. C. Mycock said he was sorry the committee had adopted the course they had in reference to the front elevation for the baths. He thought the competition would be an expensive matter. He took it that at the last meeting the only objection that the Council had to the plans was that the frontage was of too plain a character. He thought suitable plans could have been obtained at a small expense, and stated that he had seen a new plan of the front elevation which had been drawn by the Surveyor and which he thought would do. Alderman Gocoll asked if the architect whose plan was accepted would expect commission on the amount of the contract, and Alderman Peach pointed out that the terms of the resolution were that the plans should belong to the Corporation. After a great deal of discussion, an amendment was unanimously carried as follows:—"That the recommendation of the Committee be not adopted, and that they be instructed to submit an alternative elevation prepared by the Borough Surveyor, for the approval of the Council at their next meeting."

\* Mr. Mycock, and the Committee too, evidently think that architects can afford to work for nothing—Ed.

**PROPOSED PEOPLE'S HALL FOR LIVERPOOL.**—For the last year or two a scheme has been maturing for the erection of a much-needed "people's hall" in Liverpool. A Liverpool paper publishes a sketch of the proposed building, as designed by Mr. Edmund Ware, architect, Lord-street. When first proposed, the scheme was warmly taken up by several wealthy gentlemen of the city, who promised to help on the good work by every means in their power. The proposal is as follows:—"To secure a piece of land like that at the bottom of William Brown-street for a site. The small concert-room will seat 250 people, and this can be made available for concerts, dramatic performances, public meetings, and all the requirements of our rapidly deepening city life. Then comes the great hall, which is also arranged for in the block which has been planned by Mr. Ware. This will seat 2,500 people, and another thousand could find ample accommodation in the spacious aisles. It is planned to have a very small gallery at one end, with a large platform at the other, and a level floor set with chairs or moveable seats. The entire scheme is estimated to cost 31,000*l.*"

**STABLES AT SWANSEA.**—Messrs. R. Evans & Co. have just had completed in Frog-street, Swansea, what are described by the *Western Mail* as a model range of stables. The main front is of Ebbw Vale bricks, with Bridgton stone dressings, and contains a house for the stable manager. Inside the entrance is an open paved yard, and opposite to the doors is a van-shed capable of holding a score of large vans. Over this shed is a large workshop. On the left-hand side on entering the yard from the street is the stable building. A lofty arch admits to a large covered yard, which will be used for cleaning the horses, &c. The stable itself is on two sides of this covered yard, the third side being occupied with the harness-rooms and washing place. The floor is paved throughout with buff adamantine clinkers, laid to proper falls, and draining into a covered gutter which runs along the back of the stalls. The stable is divided into twelve stalls and two loose boxes, thus giving accommodation for fourteen horses. The whole of the stall divisions, manglers, &c., were supplied by Messrs. Musgrave & Co., of Belfast. An office, weigh-bridge, washing-room (with hot and cold water), a range of lofts, corn-rooms, &c., are also provided in the building. The contractors were Messrs. Jenkin Bros., of Swansea, and the architect was Mr. H. C. Portsmouth, Swansea.

**PROPOSED CENTRAL POLICE STATION AT SWANSEA.**—A special meeting of the Swansea Watch Committee was held at the Town Hall on the 12th inst., to consider a scheme for the provision of a central police-station and the abolition of the stations at High-street, Goat-street, Guildhall, and Oxford-street. Councillor Morgan detailed the scheme, the consideration of which was adjourned.

**WESLEYAN METHODIST SCHOOL AT RUSHOLME, MANCHESTER.**—The foundation-stone of a new Wesleyan Methodist School in Dickinson-road, Rusholme, was laid on Saturday last. Mr. Herbert Turner, of Manchester, is the architect, and the estimated cost is 1,800*l.* Messrs. Smith & Goodwin, of Lower Broughton, are the contractors.

**NEW BISCUIT MANUFACTURE, CARLISLE.**—A large building for Messrs. Carr & Co., biscuit manufacturers, is now in course of erection at Caldewgate, Carlisle. Mr. T. Taylor Scott, of that city, is the architect. The foundations were put in by Messrs. Johnstone Bros., builders, Blencowe-street. Since then the contracts for all the works have been let to the following tradesmen, viz.:—Builders' work, Messrs. Johnstone Bros.; Carlisle; fireproof construction, tanks, and all ironfounders' work, Messrs. Homan & Rodgers; carpenter and joiner's work, Mr. Wm. Latimer; plumber's work, Messrs. W. & R. M. Hill; slater's work, Mr. Thos. Graham; and plasterer's work, Messrs. R. M. Ormerod & Sons, all of Carlisle. The bricks that are being used are from the Birkby brick manufactory. The new buildings include a chimney-shaft 170 ft. high.

**STABLES, &c., MERTON HALL, NORFOLK.**—An extensive range of buildings is now in course of erection at Merton Hall, for the Right Hon. Lord Walsingham, to replace the old stables which were destroyed by fire in April last. The new buildings consist of stables, carriage-houses, harness-room, washing-houses for horses, cartages, and harness, coachman's house, men's mess-room, bed-rooms for grooms, hay, straw, and corn-lofts, and the necessary offices. The buildings are being carried out from designs by and under the superintendence of Messrs. Milne & Hall, architects, London, by Mr. William Hubbard, contractor, East Dereham, Norfolk, at an outlay of about 3,000*l.*

**BOARD SCHOOLS, COVENTRY.**—The Coventry School Board on the 11th inst. resolved to accept the tender of Mr. James T. Wingrove, of Northampton, for the erection of new schools in Wheatley-street. Messrs. George & Isaac Steane, of Coventry, are the architects. The contract sum is 15,551*l.*

**COTTAGE HOSPITAL, BROMSGROVE.**—The site for the cottage hospital at Bromsgrove is now being cleared. The building will face the New-road, with a side drive approach from Ednal-lane. The builder is Mr. J. Brazier, of Bromsgrove, and the contract sum is 2,673*l.* The *Bromsgrove Messenger* of the 13th inst. gives a long description of the building, but omits to mention the architect's name.

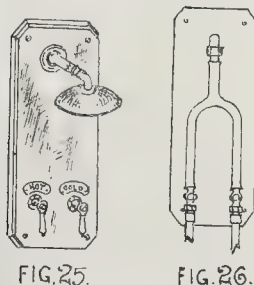


FIG. 25.

FIG. 26.

answered very well with cold water, but if a warm or tepid shower was required there was no way of testing the temperature except by climbing up and testing it with the hand; otherwise the result would be most uncertain, if not risky.



**PROPOSED NEW MUNICIPAL BUILDINGS FOR COVENTRY.**—The Corporation of Coventry, with a view to provide additional accommodation for the growing needs of the city, have provisionally purchased certain property in St. Mary's-street and Earl-street, contiguous to St. Mary's Hall, for the erection thereon of additional municipal buildings, and they have petitioned the Local Government Board to sanction the purchase.

**THE SALVATION ARMY TEMPLE AT EXETER,** which was at one time used as a meeting-place for the Friends, has just been considerably altered and enlarged. The seating accommodation has been increased from 900 to 2,000 persons. Mr. G. Coles, builder, of Exeter, carried out the work, from plans by Mr. J. Williams Dunford, architect, London. Mr. T. Morgan acted as architect's clerk of works.

**PROPOSED CREMATORIUM FOR MANCHESTER.**—The *Manchester Courier* of the 9th inst. publishes a sketch of the design by Messrs. Salomons & Steinthal, architects, of that city, for the crematorium and columbarium it is proposed to erect in Manchester. At the statutory meeting of the shareholders of the Company which has been formed to establish the crematorium, recently held, it was stated that the directors had selected a plot of land suitable for the building of such a place, on the Chorlton side of the Southern Cemetery, on Barlow Moor-road. The crematorium would thus form, as it were, a continuation of the Southern Cemetery, so that there exists a possibility of it at some future time being incorporated with the cemetery, should this ever be found desirable. The proposed crematorium will consist of a hall or chapel containing the furnace, with open columbaria for the reception of the urns and memorial tablets, and it is proposed to place the same in the centre of the plot of land acquired and about 50 yards from the road frontage. The hall will be about 50 ft. long by 25 ft. wide, and of proportionate height; in the centre at one end of the same against the wall will be placed the furnace, concealed in an ornamental marble shell, doors in either side of the same giving access to the vestry and record-room on the one side, and to the room for the gas generator, &c., on the other, steps from the latter room leading down to the engineer's-room and the basement. The hall will be flanked on either side by open arched colonnades, forming a columbarium, the recesses for the urns being formed in the exterior of the wall of the hall. An important feature in the composition will be a tower containing and masking the flue from the furnace. The style selected for the building is Romanesque, and it is proposed to build the same in stone, with red tiled roofs.

**NEW BANKING PREMISES, BRAY.**—The Northern Banking Company of Ireland have completed and opened their new office on the Quinsborough-road, Bray. The premises are situate opposite to the District Post-office. The works throughout have been carried out from the designs and under the personal superintendence of Mr. George P. Beater, architect and civil engineer, the contract for the general works having been entrusted to Mr. John Good, and that for the sanitary arrangements to Messrs. Fletcher & Philpott, all of Dublin.

**ST. JAMES'S CHURCH, SLAUGHTWATE.** On the 6th inst. the Earl of Dartmouth laid the memorial-stone forming the basis of a large number of external and internal improvements which are in progress in connexion with St. James's Church at Slaughtwate. The church was built in the latter half of the eighteenth century, and has no architectural pretensions. It was decided last year to restore the church, and the work has been placed in the hands of Messrs. John Kirk & Sons, architects, Huddersfield, and the cost is estimated at about £3,500.

#### SANITARY AND ENGINEERING NEWS.

**THE ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS** will hold a meeting at Edinburgh on September 26 and 27. On Friday, the 26th, they will meet at ten a.m. at the Royal Scottish Society of Arts, George-street, Edinburgh, where a paper will be read by Mr. Cooper, A.M.I.C.E., Burgh Engineer of Edinburgh, on "Municipal Work in Edinburgh," followed by a paper on "The Cable Tramways of Edinburgh," by Mr. W. N. Colman, A.M.I.C.E. After the discussion the members will be taken over the cable lines and visit the machinery depot, &c. At one p.m. the members will be received by the Lord Provost and members of the Corporation of Edinburgh at the City Chambers. The members will then proceed to the Exhibition, where they will be received by the Executive Committee, and visit the Exhibition. On Saturday, the 27th, members will leave the Waverley Station by the 9.50 a.m. train for Queens-ferry (North). They will be met at the station, north of the Foot Bridge, and conducted over the bridge on foot, then embark on a small steamer, passing under the bridge and around the piers, back to the south side, returning to Edinburgh by permit, a visit will be paid to Holyrood Palace, the Cathedral, or other places and objects of interest.

**THE REGISTRATION OF PLUMBERS.**—Among the resolutions passed at the recent Trade Union Congress at Liverpool was the following:—"That, in the opinion of this Congress, the Registration of Plumbers should be made compulsory; that the number of Sanitary Inspectors should be largely increased by the appointment of duly qualified plumbers; and that the apprenticeship of these should be made the rule of the trade, the indentures to provide for the technical education of the apprentice."

**VISIT OF THE SOCIETY OF ENGINEERS TO CREWE.**—A very interesting visit was made on September 16 by the Society of Engineers to the London and North-Western Railway Works at Crewe. Upon the arrival of the visitors at the works (which cover an area of over eighty-five acres of ground) they were conveyed to the Bessemer Steel Converting House, where the process of steel-making was shown, after which they proceeded past the Siemens-Martin Furnaces to the 14-in. Merchant Mill, where the spring-plates and fish-plates are rolled. Here the saws, to the required lengths, punched, straightened, and finished ready for sending away. Thence to the Rail Mill, which was occupied in rolling 30-ft. lengths of rails, 90 lbs. per yard; thence to the Points and Crossings Shop, where the different kinds of switches and crossings were made. The next shop which was visited was the Boiler Shop. Here locomotive and stationary boilers, as well as bridge-work, were seen in different stages of manufacture, the hydraulic riveting machinery being especially worthy of notice. Thence they passed on to other departments of these extensive and interesting works, and were conveyed back to London by the Great train.

**UCKFIELD WATER-WORKS.**—The water-works for Uckfield (Sussex) have recently been carried out from the plans and under the superintendence of Mr. H. Bertram Nichols, A.M.I.C.E. A pumping scheme has been adopted, gravitation not being available. A well has been sunk to a depth of 278 ft. into the water-bearing strata. The water rises in the well to within 7 ft. of the surface, and an abundant supply of good quality has been met with. The motive power for raising the water to the service reservoir is a petroleum engine, supplemented by wind power, the windmill, of the "Hallday" pattern, being carried up to a height of 90 ft. Great economy is thus experienced in the annual working expenses, gas and coal being expensive items in the district. The service reservoir, having a capacity of 250,000 gallons, is constructed of concrete, and covered. A good pressure is obtained throughout the town. The mains vary from 6 in. to 3 in. in diameter, and shut-off valves, hydrants, &c., are fixed in suitable positions. The work has been promoted by a private company, and the cost has been about £3,500, which is irrespective of land, parliamentary, and other charges. The contractor for the well and bore-hole was Mr. N. Mouzler, of Birmingham. The remaining works forming the main contract were satisfactorily carried out by Messrs. W. Jenkins & Sons, contractors, of Leamington.

**THE LOCAL GOVERNMENT BOARD** have issued to Sanitary Authorities a circular as to Provisional Orders under the Public Health Acts, the Local Government Act, 1885, the Housing of the Working Classes Act, 1890, and the Gas and Water Works Facilities Acts. They direct that all applications for Provisional Orders under these enactments must be received by them not later than November 30 next, except that applications under the Lands Clauses Acts may be sent in up to December 21. The circular is accompanied by special instructions as to improvement schemes under the Housing of the Working Classes Act of last session.

**WATER SUPPLY OF SHREWSBURY.**—A long and tedious discussion which took place at the meeting of the Shrewsbury Corporation last week as to the water supply of the town terminated, practically, in a determination to do nothing. The *Shrewsbury Chronicle* remarks that "this unfortunate disposition to defer all improvement until a new and absolutely pure supply of water from an uncontaminated source can be entered upon is neither fair to the new Water Committee nor just to the ratepayers. While anxious to give the majority in the Council the credit of good intentions in not expending more money than is absolutely necessary upon the present impure source of supply, we think they ought to have met the minority in a fairer spirit, and have welcomed the suggestion to improve as much as possible, as a temporary expedient, their present supply, at the least, possible cost, rather than to have rejected it *à la fois*. In the course of the proposals of the Water Committee contended that any outlay with the view of continuing the present supply as permanent or final would be altogether at variance with the opinion of the medical practitioners in the town, who complain of the prejudicial effects of the Severn water upon the health of the inhabitants. In the course of the discussion, a report by Mr. Baldwin Latham was read, condemning the situation of the intake on the Severn as likely to endanger the health of water-consumers. There seems to be no doubt that eventually Shrewsbury will have to face this vital question."

**THE DRAINAGE OF SUTTON COLDFIELD.**—In consequence of the complaint received by the Sutton Coldfield Corporation of the great volume of sub-soil water which found its way into the main sewers, measures have recently been taken by the Borough Surveyor (Mr. C. F. Marston, C.E.) to prevent this infiltration. As the result of an examination of the sewers he discovered (according to the *Birmingham Gazette*) that, owing to the stoppage of a sub-soil drain and other causes, upwards of 50,000 gallons of water were entering the sewer every twenty-four hours near the Victoria-road. To stop this large infiltration, a length of about 50 yards of the 18-in. sewer has been taken up and relaid, at his suggestion, with Hassall's patent safety joint-pipes, in place of the old earthenware pipes. An inspection of the joints of these pipes was made on the 4th inst., in the presence of a number of engineers and others interested in sanitary work. The pipes were subjected to a severe test, and the result is stated to have been most satisfactory.

**PROPOSED BATHS AND WASH-HOUSES FOR LAMBETH.**—At the meeting of the Lambeth Vestry on the 11th inst., Councillor Hubbard moved "That a Special Committee be appointed to consider and report as to the advisability of establishing Baths and Wash-houses in the parish." He pointed out that a large number of parishes in the metropolis have established baths, and had not found them a very costly thing. Mr. Howlett, seconded the motion, but hoped that the Committee would act carefully in the matter, because Lambeth was very well supplied with swimming accommodation. What he wanted to see established—especially in the more crowded portions of the parish—were the wash-houses, which were agreed to.

**CLOXWEL WATER WORKS AND SEWERAGE.**—The "London engineer" named in a paragraph under this heading on p. 195 ante as assessor in this competition was Mr. J. C. Melliss.

#### STAINED GLASS AND DECORATION.

**MEMORIAL WINDOW TO KING ALFRED.**—A memorial window to King Alfred, the outcome of efforts in connection with the jubilee of Queen Victoria's reign, has been inserted in the west end of Wedmore parish church. The window is the work of Messrs. Clayton & Bell. In the upper part of the design are three crowned heads of kings Henry III., Edward III., and George III., and beneath these in rich colours are full length figures—Alfred, William I., Elizabeth, and Victoria. Beneath each figure is a historical scene, representing Alfred in the Isle of Athelney, Guthrum at Wedmore; Harold swearing to Duke William that he will not lay claim to the throne of England, and the Battle of Hastings and death of Harold; Sir Walter Raleigh spreading his cloak before Queen Elizabeth, and the Spanish Armada, are represented beneath the figures of Queen Elizabeth; and beneath that of Queen Victoria are the coronation of the Queen and a group representing her Majesty surrounded by her family.

**WEST WINDOW, EXHALL (BEDWORTH) CHURCH.**—The three-light west window of this church has been filled with stained glass, representing (1) Our Lord Blessing Little Children, (2) Hannah presenting Samuel to Eli, (3) Eunice and Lois teaching the young David to play on the harp. The work has been executed by Messrs. Hardman, of Birmingham.

**THE COLBORNE MEMORIAL IN HERFORD CATHEDRAL.**—A stained-glass window has just been placed in one of the north transept clearstory windows of Hereford Cathedral, adjoining the window erected to the memory of a previous organist, Mr. Townsend Smith, from the works of Messrs. Clayton & Bell, London, to the memory of the late organist, Dr. Colborne. In the centre light is a figure of St. Cecilia playing on an organ with an attendant angel. In each of the six circular lights surrounding the centre are angels playing on musical instruments. The window has been fixed up by Mr. Robert Clarke, of Birmingham.

**THREE BRONZE PANELS,** bearing the name and date of foundation, have lately been placed in the Clare-street front of the new building in Bristol for the Provident Life Office. They are the work of Messrs. Singer & Sons, of Frome, Somerset, from the designs of Mr. E. Henry Edwards, architect, Bristol.

**WINDOWS AT ALMONDSBURY CHURCH.**—Three west windows, the gift of Mr. Sholto Vere Hare, in memory of his late wife, are now in course of execution at Almondsbury Church by Mr. Hardman, of Birmingham, and it is hoped that they will be placed in position by Christmas. The general scheme of subjects represented in the three windows is intended to be, North—1st, Death and the grave conquered in the Resurrection. 2nd, The blessed hope that we may follow Him in His ascension into Heaven. 3rd, The reward of the good deeds done by His faithful servants while in the flesh, and their admission to the enjoyment of the beatific vision to all eternity.

**WALL-MEMORIAL WINDOW, LISIAN CHURCH.**—On the 3rd inst. a memorial window in Lisian Church, North of Ireland, to the memory of the Rev. George Walker, D.D., who was Governor of Derry during the siege of that town, was unveiled. It is the work of Messrs. Carlisle & Wilson, of Belfast.



## FOREIGN AND COLONIAL.

**FRANCE.**—The splendid collection of tapestries of the Cathedral of Rheims is at present undergoing a process of cleansing and repair. These tapestries date from the sixteenth century and were given to the Cathedral by the Cardinal de Lorraine; they represent the life and death of the Virgin. A copy of the "Venus à la Coquille" of Coyssevox, by M. Suchetet, has just been placed at the end of the "Parterre de Latone" in the park at Versailles, to replace the original which, after repair, has been more safely lodged in the Louvre. The Suburban Committee for the National Monument to Joan of Arc, at its last meeting, appointed three of its members, of whom M. Bailly was one, to select a sculptor to execute the statue of the principal figure, which is to represent her in the costume of a peasant. The monument is commissioned to be ready for inauguration by the spring of 1892. The town of Châteaudun, which distinguished itself by a spirited defence in the Franco-German war, is about to erect a monument in commemoration of the combat of October 18, 1870. The death is announced at Bordeaux of the landscape-painter Amédée Baudin, whose works have figured in every salon since 1852. M. Lambert, Rector of the University of Versailles in the court of the Marais of the Ninth Arrondissement at Paris, has offered to the town of Ferney a reproduction in bronze of the work. M. Lambert is the present owner of the château at Ferney in which Voltaire lived. A French tourist, M. Martel, has made an interesting exploration of the caves of Padirac, near Rocamadour, in twenty-four hours, and has discovered eleven lakes or pools, thirty-nine small cascades, and numerous grottoes, besides a great cave or hall 88 metres high. It is suggested that this be taken in hand and made a "show place" of. A hatchet of out flint has been found in the Bois de Boulogne, near the alley of Acanais, apparently of great antiquity. It was found about 5 ft. below the level of the ground, in a layer of flints and sand which formed part of the bed or shore of the Seine in ancient days.

**MILAN.**—According to the *Courrier de l'Art*, the model of the late Signor Brentano's design for the new façade of Milan Cathedral has been commenced some time back and is now well advanced. According to the original conditions of the competition, the model is to the large scale of 1/16 of the actual work. It is expected that the model will be exhibited towards the close of the year; but whether or when the actual work will be commenced seems still doubtful.

## MISCELLANEOUS.

**PARTIAL DESTRUCTION OF THE ALHAMBRA AT GRANADA.**—Telegrams from Madrid and Granada state that at about 10 o'clock on Monday night an alarming fire broke out in that part of the Alhambra known as the Patio de Alberca, which is situated close to the famous Patio de los Leones, or Court of the Lions, and the Toledor de la Reina, or Queen's Drawing-room. The fire was finally extinguished on Tuesday morning after doing damage which is irreparable, although less extensive than was at first feared. The portion burnt comprises the Sala de la Barca and the right wing of the Arrayanes Court. The remainder of the building was saved. Eight persons were slightly injured. The cause of the damage has been ascertained, but the suspicions are entertained that it was the work of an incendiary. The judicial authorities have opened an inquiry.

**TECHNICAL CLASSES AT GLASGOW.**—We have received the prospectus and time-table of day and evening classes in Civil Engineering, Building Construction and Architecture, and Plumbing and Sanitation, to be held during the coming winter months under the auspices of the Glasgow and West of Scotland Technical College, Glasgow. The syllabus appears to be very full and complete, and the fees are moderate. The Lecturers are:—For Civil Engineering, Mr. Arthur W. Thomson, B.Sc., C.E.; for Building Construction and Architecture, Mr. Charles Gourlay, A.R.I.B.A.; for Plumbing, Mr. David Paterson, F.R.C.S.; and for Sanitation, Mr. Gilbert Thomson, M.A., C.E. The classes will commence early in October, in the Andersonian and Science Arts Buildings, George-street and Bath-street. The courses of study, we are informed by Mr. Gourlay, are those of the Science and Art Department, and the City and Guilds of London Institute, but the Honours Class is likely to be specially useful to those who intend to study for the Associate Examination of the Royal Institute of British Architects.

**FIREPROOF DOORS.**—An interesting proof of the resistance of some simply constructed fireproof doors has been given at Glogau, in Germany, on August 5, during a large fire at one of the military establishments. According to the *Central-Blätter Bauwesen*, these doors, of 4 cm. thick pine-wood boarding, sheeted on either side with 3 mm. thick iron plating, resisted the intense heat of the fire for more than three hours, thereby saving a wing of the otherwise gutted building. On examining the doors after the fire, the side of the wood nearest the fire was found charred, whilst the further side still showed its natural light colour.

**A PROPOSED NEW LINE OF RAILWAY TO LONDON FROM THE NORTH.**—Several provincial journals repeat the statement, noticed by us some little time ago, that the Manchester, Sheffield, and Lincolnshire Railway Company intend next Session to bring in a Bill for a new railway, to give them a direct route from Liverpool and Grimsby, via Nottingham, Rugby, and Aylesbury, to London. It will run within half a mile of Lutworth, the inhabitants of which town have long bewailed the fact that through the folly of their ancestors in opposing railways they have hitherto been without direct communication.

**"SKY SIGNS."**—It is understood that the question of sky signs is to come before the London County Council at the earliest moment. The point will be raised whether erections of this kind, which are virtually a raising of the house, can be placed in position without the consent of the surveyor acting on behalf of the public authorities. If not, it may be taken as settled that "sky signs" will not only be stopped in their growth, but will be greatly reduced. A correspondent suggests that the Advertising Stations (Rating) Act, 1889, Section 4, seems to apply to such signs, and if ordinary hoardings in outside districts are assessed upon rentals of 6d. per yard superficial per month, the rating of these huge structures in the best positions in the City would bring some consolation to the ratepayers, if it does not offer inducement for the discontinuance of the signs.—*Metropolitan.*

**STREET IMPROVEMENTS AT WILLESDEN.**—Mr. Arnold Taylor, one of the Local Government Board Inspectors, held an inquiry a few days ago at the offices of the Willesden Local Board relative to the application on behalf of that board to borrow 4,623l. for works on private streets improvement. From the statements made by Mr. S. Tilley, Clerk to the Board, and Mr. Robson, the Surveyor, it appeared the loan was to make up eight new streets. Last year no fewer than forty new streets were made up. Statistics were given by Mr. Tilley showing that the population of Willesden had risen from 27,397 in 1881 to a present estimated population of 59,000. The development of the neighbourhood was ascribed to the great facilities afforded by the railway and omnibus companies. Mr. Taylor said he had heard that no district in the metropolitan area had developed so rapidly as Willesden. The existing loans were stated to amount to 55,142l.

**THE PROPOSED VAUXHALL IMPROVEMENT.**—At the last meeting of the Lambeth Vestry, a letter was received from the London County Council, intimating that the Council would apply to Parliament at the next session to power to widen the Albert Embankment between Upper Kennington Lane and Vauxhall Walk, provided the Vestry would contribute one-fourth of the net cost of the improvement, which was estimated at 26,600l.—Mr. Howlett moved that a letter be sent to the Council declining the proposal. The improvement would be of no use unless it was extended to High-street, Vauxhall, and Nine Elms Lane, and it was no use frittering money away on sections of the road. If ever there was a metropolitan improvement this was one.—Mr. White seconded, and maintained that the work should be carried out by the Council.—Mr. Priedrich disagreed with the remarks of the previous speakers, and contended that the Vestry would recoup themselves the 6,500l. they were asked to contribute by the increased value of the frontages.—The motion was supported by Captain Andrew, Messrs. Ayling, Sharpley, Chambers, and Edwards, and agreed to. We think the Lambeth Vestry will do well to reconsider this decision, on the principle that "half a loaf is better than no bread." There is great need of an improvement at the spot in question. If an instalment of the improvement were carried out, its completion would probably follow in due course.

**THE ENGLISH IRON TRADE.**—There is greater activity in the English iron market. Consumers, both at home and abroad, appear to recognize the fact that prices are not likely to recede again this year, and are consequently anxious to cover their requirements at present rates, which, according to makers, are still too low to profitably cover the cost of manufacture. In pig-iron there is a decided upward tendency. Scotch warrants have been going up all the week, and Scotch makers' price is following the lead, as much as 1s. 6d. per ton more being now quoted for some brands. Middlesbrough pig is 9d. per ton dearer, and pig-iron in other districts is advancing. Makers of Bessemer iron have not yet raised their bottom price, but hematite warrants are nearly 2s. dearer. Together with pig-iron, old materials are taking an upward turn. Finished iron and steel are in fairly active request, with prices firm. There is a lull in the tin-plate trade, but makers are very stiff. Shipbuilders have not been booking any fresh orders of consequence this week. Engineers continue actively engaged.—*Iron.*

**THE NATIONAL ARMADA MEMORIAL AT PLYMOUTH** is to be unveiled during the second week in October by H.R.H. the Duke of Edinburgh.

MR. JAMES HILL, of the firm of James Hill & Co., Queen Victoria-street, has just returned to London, after a ten months' tour round the world.

**EXCAVATIONS AT CASTLE CARY.**—The excavations at Castle Cary, says the *Western Chronicle*, have been steadily pursued, and now the foundations of the keep of Cary Castle are sufficiently exposed to enable an accurate ground-plan to be made. This plan reveals a state of things that was totally unexpected both by archaeologists and the general public. In the first place, it shows beyond doubt that the castle was not in the position where it was generally supposed to stand, and where its site had been marked on the latest Ordnance map, but about 200 yards to the south-west of it; and it shows that the castle was not an ordinary "shell keep," as described by Clark, but a strongly-built fortress of unusually large dimensions and thickness of walls. The plan of the excavations, as far as they are gone, gives an idea of the size and strength of this stronghold of the Lovels. It represents the outer wall to be 15 ft. in thickness, the foundations of which are of "Cary Hill" stone, and the facings of "Doulting" and "Ham Hill." Careful and accurate plans and sections are being prepared for the purpose of preservation among the records of the Archaeological Society at Taunton. But there is still a good deal to be done. The keep is nearly complete, but the walls of the inner and outer baileys are yet to be discovered and put upon the plan.

**THE ARCHAEOLOGICAL EXCAVATIONS AT KENILWORTH.**—The *Country Herald* reports that these excavations are now completed, and that the churchyard has resumed its usual quiet appearance. The nave and north transept of the long-buried church have been cleared, the tiled floor removed, and the surface levelled and turfed over. The removal of the *débris* has given a sharp pitch of about 5 ft. below the level of the adjoining burial-ground; and to meet this difficulty a strongly-built retaining wall has been erected. This answers the double purpose of guarding the nearest row of graves from a landslip, and also gives a pleasing promenade, from which a good view of the excavations may be obtained. The wall extends to the extremity of the north transept, leaving the altarpiece of the Lady Chapel projecting at the foot. The two stone effigies, found during the progress of the work, have been built into the wall. The largest is that of a Canon (headless) in full vestments, and the smaller (also headless) is a grotesque figure of a monk, seated. The pillars, which originally supported the tower, are left *in situ*, and have been pointed up and raised. The flight of steps leading from the church to the cloisters has been preserved, and the space within the cloisters and the outer monastic buildings has been levelled and turfed over, and with the remainder of the excavated area will now be used for burial purposes. The south transept, chancel, and chapter-house are still untouched, and as these portions are on land which is vested in the Local Board there ought to be no difficulties in the way of further research.

**A LARGE MONOLITH.**—Vinalhaven, Maine, claims to have produced the largest stone ever brought to light. The Bodwell Granite Company recently quarried a shaft of granite which, it is said, is the largest piece of stone ever quarried anywhere, and, if erected, will be the highest, largest, and heaviest single piece of solid stone standing, or that ever stood, so far as any record can be found. In height it considerably exceeds any of the Egyptian obelisks. It is understood, says *Stone*, that the Company quarried this immense monolith on their own account, not having an order for anything of the kind, and they suggest that it would be a fitting contribution from Maine for the monument to be erected in honour of General Grant.

**AN AMERICAN TECHNICAL JOURNAL ON "CHINANILLA."**—We hope to be forgiven for lack of reverence for things that are ancient, but we must say that there is a precious lot of old brick gathered together by collectors that has neither merit nor history to commend it, and much of it is absolutely ugly,—that is, it is painful to look at it. There are some old things in ceramics that are good and worth gathering together, but the bulk of it is rubbish that is very much like some of the rubbish that is thrown on the market under the guise of novelty. When it first appears, the price is put high enough to impress a possible purchaser with the idea that it is a meritorious bit of pottery. He buys a piece of the line, say a small vase, for 10dols., and takes it home to show the innocents of his domestic what a discoverer he is. Six months after he finds a huckster who has picked up the tail end of the "job," and is hawking the selfsame vases on the streets for a quarter. Then he feels real good, like the man in Wall-street a few days ago, who cursed the poor Dago for selling some fancy pottery at rock-bottom prices which corresponded precisely with the expensive pieces of the same line that he had bought last winter. There is a happy mean between old rubbish and new rubbish, and that is solid merit of any age or period whatever.—*Crockery Journal of New York.*

**ROBERT BROWNING.**—The Society of Arts have erected one of their memorial tablets on the house, No. 19, Warwick-crescent, Malton-hill, where Robert Browning lived from the time of his return from Italy after the death of his wife, in 1861, until the summer of 1867, when he removed to 29, De Vere-gardens.



## LEGAL.

## DAMAGES AGAINST A STATION-MASTER FOR THE DETENTION OF BUILDING MATERIALS.

In the County of London Sheriff's Court on the 11th inst., before Mr. Under-Sheriff Burchell and a jury, the case of Pilbrow v. Ingham & Sons, Holland, and Mansell was heard. It was an action originally before the High Court, and was remitted for the assessment of damages.

Mr. Overend, the counsel for the plaintiff, stated that his client was a builder in Hounslow, and traded under the style of Taylor & Pilbrow. In June last he ordered a quantity of glazed bricks and pipes from Ingham & Sons, a provincial firm, through Mr. Holland, their representative. The goods were duly forwarded by rail to Hounslow, the plaintiff previously receiving an invoice marked "carriage paid." He sent men and carts to the station to remove the goods, but the station-master refused to deliver them up unless the carriage was paid. The invoice, with the endorsement, was shown to him, but he declined to recognise it, remarking that "any one might have written in the words." The consequence was that the plaintiff was unable to complete work he had in hand, and, besides, his credit was injured by a rumour being circulated in the district that he had bricks at the station, and could not pay the carriage. It was at first supposed that Messrs. Ingham & Sons and Mr. Holland had failed to carry out their contract, but that turned out to be a mistake, and the claim for damages was made only against Mr. Mansell, the station master.

After a long consultation, the jury gave a verdict for £50 against Mansell.

## RECENT PATENTS:

## ABSTRACTS OF SPECIFICATIONS.

7,241.—CONSTRUCTION OF WALLS: J. Wilson.—According to this invention layers of corrugated metal plates are placed with the respective concavities opposite to each other, so that the double corrugation forms a tube. These spaces are filled with asphaltum and a wall thus built up, or sheets of metal are placed a short distance apart and strengthened by pipes or equivalent, and thus a wall is formed. Many modifications for different purposes are described in the specification.

12,153.—VENTILATING SEWERS, &c.: F. Barnett.—By this invention, iron, or other pipes of sufficient strength and calibre are fixed with their lowest ends seated in the walls of these sewers, near the crown of their arches, and are brought vertically up the fronts, sides, or backs of houses to about 10 or 15 ft. above the roofs, and fitted with revolving cowls. Short inlet pipes are used, and by reason of the outlet pipes being so much longer the sewer gas is carried off. The action of exhaustion is permanent, like that of a syphon with inverted action.

12,483.—BARS FOR FIRE-GRATES: R. Peel.—This patent relates to a new method of attaching the end-pieces of top bars for fire-grates to the top or ornamental plate. This is generally effected by dovetail, but in this improvement lugs or projections are formed on the plate, to which the bars may be secured.

12,997.—LIME-KILNS: A. Bishop.—According to this invention a dome is made to the improved kiln, which is circular on plan, and the centre of the dome is provided with a shaft, and round the central shaft smaller feeding shafts are placed. In burning lime, the lime form of kiln, the fire, being once established, the process is continuous, the chalk being introduced through the central shaft in a quantity to keep the shaft nearly filled to the top. Fuel is also constantly admitted in small quantities. As the fuel is consumed and the chalk converted into lime, it passes down the kiln, and is removed at bottom, and the portion of the shaft is introduced through the small feeding-shafts being deposited near the circumference of the burning mass, the flames from it are drawn onwards towards the centre on their way towards the central shaft, and produce a high temperature with a very moderate amount of fuel.

5,905.—IMPROVEMENT IN JOINERS' SQUARES: H. D. Marples.—The blade has an edge graduated as a measure. The wooden part is fitted with a longitudinal and transverse spirit level, and the upper part of the wood arranged as a mitre.

## NEW APPLICATIONS FOR PATENTS.

Sept. 1.—13,707, J. Gill, Roofing and Fastening Tiles.—13,737, S. Washington, Connecting Lead Pipes, &c.

Sept. 2.—13,745, G. Willcock, Fastenings for Window-sashes.—13,764, H. Sutcliffe, Lavatory Wash-basins.

Sept. 3.—13,812, E. Hill, Cente Bearings for Swing Windows, Ventilators, &c.—13,822, R. Willcock, Locks and Fastenings for Doors and Casements.—13,860, G. Gardner, Scaffold-fastenings.

Sept. 4.—13,883, J. S. Salk, Brick-making Machinery, &c.—12,896, J. Bramley, Ventilation.

Sept. 5.—13,957, J. Legge, Door-latches.—13,972, E. Emanuel and others, Supply-valve for Rent-action Water-closets and Water Waste-preventer for combined.

Sept. 6.—14,017, P. Walker, Ventilators.—14,058, G. Hovey Hopper, Ventilators for Windows, &c.—14,057, T. Harris, Water-closets.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

10,457, T. Bremner, Connecting Cords to Window-sash Frames, &c.—10,631, J. Birch, Nightlight Opener, &c.

10,959, G. Pearson, Securing Tiles or Panels to their Backings.—11,204, H. Lomax and W. Cotton, Fastening Doors, &c.—11,277, J. Merryweather, Cleaning and Disinfecting Drains, &c.—12,011, G. Rohrbach, Gate-hinges.—12,012, G. Rohrbach, Gate-latches.—12,205, E. Bally and E. Wehrli, Parquetry.—12,379, H. Mott and J. Perry, Decorative Wallpapers.—12,423, H. Kelsey, Casement Fastener.—12,569, P. Ayton, Bolt-fastener for Casement-windows, &c.—12,655, R. Stanworth, Flushing Tanks.—12,687, G. Chaillet, Folding Step-ladder.—

12,721, J. Fryer, Bricks.—12,738, J. Bowring, Portland Cement, &c.—12,751, H. Werner, Concrete Pipes, &c.—13,078, T. Faucett, Brick-making and Pressing Machinery.—13,134, C. Abel, Bricks, &c.—13,155, L. John, Firing Pottery.—13,227, C. Bouquet, Cement.—13,283, J. Kiekman, Kilns or Ovens for Burning Bricks, Tiles, &c.—13,315, W. Henley and others, Window-sashes, &c.

## COMPLETE SPECIFICATIONS ACCEPTED.

## Open to Opposition for Two Months.

16,218, M. Rogers, securing Window-sashes in any desired position.—17,443, W. Lindsay, Tiles, and structures in which they are used.—17,469, J. Empson and others, Valves for Glaziers.—17,500, J. Pyle, Water-taps.—18,143, H. Nettelford and J. Sheldon, Screws.—7,204, W. Thompson, Mortising and Boring Machines.—7,465, A. Moore and H. Pettis, Sheet Metal Roofing.—11,425, P. Smith, Sash Fastener.—11,416, W. Thompson, Door Bells, &c.

## SOME RECENT SALES OF PROPERTY:

## ESTATE EXCHANGE REPORT.

SEPTEMBER 9.—By A. G. Thompson & Co.: 11, Hanover-st., Belgavia, u.t. 34 yrs., g.t. 71, 460l.; By W. H. Keer: 11, Garsick-lane, City, u.t. 12 yrs., r. 100l., 100l.

SEPTEMBER 10.—By Hampton & Sons: "Taplow House," Taplow, and 24a, R. 33p. f. and c., 17,000l.; By Wyatte & Son (at Chichester): three f. cottages, Orchard-st., Chichester, r. 29l. 18s., 350l.; two f. houses, r. 23l. 8s., 11,425, P. Smith, Sash Fastener.—11,416, W. Thompson, Door Bells, &c.

SEPTEMBER 11.—By C. C. T. Moore: 51 and 57, Willow-act, Westminster, u.t. 54 yrs., g.t. 100l. 10s., r. 65l. 5s.; 53, Colburn-row, ditto, f. r. 36l., 57d. 5s.; Rochester-row, ditto, f. 550l.; 24 and 26, Collingwood-st., Bethnal-green, c. r. 44l. 4s., 370l.; 22 and 23, Cotton-gardens, Shoreditch, f. 65l.; and 8 and 9, Vine-st., Minster, u.t. 7 yrs. 18s., 172l. 18s., 75s. By F. Matthews: 38, 40, 66 to 72 (even), Warwick-act, West Ham, u.t. 90 yrs., g.t. 33l. r. 168l. 6s., 1,020l.; three houses, Sydney-row, Hornsey, u.t. 93 yrs., g.t. 18l. 8s., r. 30l. 7d.; "Gayton House," Gayton-row, Harrow, f. r. 100l., 1,650l.; 17 and 19, Handon-row, Lee, u.t. 77 yrs., g.t. 4l. r. 82l., 1,200l.; 13, 14, and 15, South-rd., Erith, u.t. 68 yrs., g.t. 12l. r. 600l.; the f. house, "Ormsdon," Lemney Park-rd., Erith, r. 60l., 1,000l.

[Contractions used in these lists.—P.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; f.g.r. for improved ground-rent; g.t. for ground-rent; r. for rent; t. for freehold; c. for copyhold; i. for leasehold; e. for estimated rental; u.t. for unexpired term; p. for per annum; yr. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

## PRICES CURRENT OF MATERIALS.

TIMBER.	£.	s.	d.
Greenheart, B.G. ....	ton	6	10 7 5 0
Task E.I. ....	load	19	13 0 0
Sequoia, U.S. ....	foot cube	0	2 3 0 0
Ash, Canada, ....	load	2	10 4 5 0
Birch " ....	"	2	5 0 4 5 0
Elm " ....	"	2	10 4 5 0
Fir, Danstic, ....	"	2	0 3 15 0
Oak " ....	"	2	10 4 10 0
Pine, Canada, red " ....	"	5	0 10 0 0
" yellow " ....	"	3	0 6 10 0
Lath, Danstic, ....	fathom	5	0 6 0 0
St. Petersburg, ....	"	6	18 7 0 0
Deal, Finland, 2nd and 1st, std. 100 350 " ....	"	15	10 0 0
" 4th and 3rd " ....	"	7	0 7 10 0
Riga " ....	"	6	0 8 10 0
St. Petersburg, 2nd " ....	"	15	10 0 0
" white " ....	"	7	0 10 0 0
Swedish " ....	"	7	0 15 0 0
White Sea " ....	"	8	0 17 0 0
Canada, Pine, 1st " ....	"	13	0 24 0 0
" 2nd " ....	"	9	0 16 0 0
" 3rd, std. " ....	"	7	0 10 0 0
Spruce, 1st " ....	"	10	0 10 0 0
" 3rd and 2nd " ....	"	6	10 8 0 0
New Brunswick, &c. " ....	"	5	10 7 10 0
Baltic, all kinds " ....	"	4	0 15 0 0
Flooring Boards, sq. f. in, prepared, First " ....	"	0	10 0 14 0
Second " ....	"	0	8 0 10 6
Other qualities, in London, " ....	"	0	6 0 15 0
Cedar, Cuba " ....	foot	0	0 25 0 0
Honduras, &c. " ....	"	0	0 34 0 0
Mahogany, Cuba, ....	"	0	0 40 0 0
St. Domingo, cargo average " ....	"	0	0 44 0 0
Mexican " ....	"	0	0 44 0 0
Tobacco " ....	"	0	0 54 0 0
Box, Turkey " ....	"	0	0 64 0 0
Rose, Rio " ....	"	23	0 12 0 0
Bahia " ....	"	12	0 18 0 0
Saint, St. Domingo, ....	foot	0	0 10 1 8
Porto Rico " ....	"	0	0 10 0 6
Walnut, Italian " ....	"	0	0 4 0 7

## METALS.

IRON—Bar, Welsh, in London ton	6	10 0 6 17 6
" " at works in Wales " "	6	0 0 6 10 0
" Standard, in London, " "	6	0 0 6 10 0
COPPER—British, cake and ingot	65	0 0 65 10 0
Best selected " "	67	0 0 65 10 0
Sheets, strong " "	73	0 0 74 0 0
Chill bars " "	81	0 0 81 0 0
YELLOW METAL, .... lb.	0	0 63 0 0 64
LEAD—Pig, Spanish, .... ton	13	13 9 0 0 0
English, com. brands " "	13	13 9 0 0 0
Sheet, English, 3 lbs. per square foot and upwards " "	15	0 0 0 0 0
Pipe " "	15	0 0 0 0 0
ZINC—English sheet " ton	25	10 0 26 0 0
TIN—Strait " " "	39	0 0 0 0 0
Australian " " "	99	0 0 0 0 0
English Ingots " " "	102	0 0 0 0 0

## OILS.

Lined " " " ton	24	10 0 24 15 0
Cocoon, Ceylon " " "	33	10 0 34 0 0
" Ceylon " " "	32	10 0 33 0 0
Palm, Lago " " "	29	0 0 0 0 0

OILS (continued).		£.	s.	d.	£.	s.	d.
Rapeseed, English pale	.....	31	0	0	0	0	0
"    brown	.....	29	10	0	0	0	0
Cottonseed, refined	.....	21	10	0	0	0	0
Tallow and Oleine	.....	21	0	0	40	0	0
Lubricating, U.S.	.....	5	10	0	6	0	0
"    refined	.....	7	0	0	12	0	0
TAR—Stockholm	.....barrel	1	0	6	0	0	0
Archangel	.....	0	15	0	0	0	0

## TENDERS.

[Communications for insertion under this heading must reach us not later than 12 noon on Thursday.]

ARKLEY (near High Barnet).—For alterations to Eastwood, for Mrs. Barnes. Mr. Hubert A. Gregg, architect, 1a, St. Helen's-place, E.C. — James, Barnet (accepted) ..... £230 0 0

ARKLEY (near High Barnet).—For rebuilding the vicarage for Mrs. Barnes. Mr. Hubert A. Gregg, architect, 1a, St. Helen's-place, E.C. — James, Barnet (accepted) ..... £250 0 0

REDDINGTON (Surrey).—For first portion of new flour mill, at Reddington, Surrey, for Messrs. J. & T. H. Wallis. Mr. Horace T. Jenner, architect, 29, King-street, Chancery, E.C. Quantities supplied:—  
Chappell ..... £2,300 0 0  
Jerrard ..... 1,925 0 0  
Spencer & Co. .... 1,920 0 0  
Holloway ..... 1,890 0 0  
Page ..... 1,896 0 0  
Humphries ..... 1,810 0 0  
Smith & Son ..... 1,798 0 0  
Taylor ..... 1,789 0 0  
Trappitt, Beddington (accepted) ..... 1,700 0 0

BELFAST.—For works on the Antrim-road, Belfast. Mr. John H. Brett, County Surveyor, County Court-house, Crumlin-road, Belfast:—  
John Smith, York-road, Belfast\* £1,500 0 0  
Gregg & Gaston ..... 1,498 19 0  
\* Accepted.

BLACKWOOD (Mon).—For the erection of a new English Baptist Chapel at Blackwood, Mon. Mr. W. L. Griffiths, architect, 55, High-street, Newport, Mon. —  
H. Welsh ..... £1,550 0 0  
J. Linton ..... 1,400 0 0  
T. Lawrence ..... 1,350 0 0  
Hughes & Pugh ..... 1,345 12 6  
Morris & Thomas ..... 1,285 0 0  
John Hardy, Blackwood (accepted) ..... 1,092 0 0

BRAY (Ireland).—For the erection of stabling, &c., at Bray, Ireland, for the Bray Township Commissioners. Mr. F. Comer, Township Surveyor, S. Anglessea-street, Dublin:—  
Henry Pemberton ..... £279 0 0  
Robert O'Connor ..... 449 0 0  
Bernard Brady & Sons, Bray\* ..... 396 8 4  
\* Accepted.

BRIMSDOWN (Middlesex).—For the erection of four cottages on the Brimsdown Estate, for Mr. Godfrey A. Baker. Mr. G. Warren Cooper, Bedford Row House, Bedford-row, W.C., architect:—  
C. J. Brice, Beckenham (accepted) ..... £760 0 0

BRIMSDOWN (Middlesex).—For the erection of fourteen cottages on the Brimsdown Estate, for Mr. Godfrey A. Baker. Mr. G. Warren Cooper, Bedford Row House, Bedford-row, W.C., architect. No quantities:—  
F. Voller, Wood Green ..... £3,983 0 0  
S. Goodall, Stoke Newington (accepted) ..... 2,840 0 0

BURNOPFIELD (Co. Durham).—For additions to co-operative stores at Burnopfield, for the Burnopfield District Co-operative Society. Mr. J. Wm. Rountwaite, architect, Blackhill, Co. Durham:—  
Whole Tenders.  
H. Brown & Co., Newcastle-on-Tyne £700 0 0  
R. Mitchell & Co., Newcastle-on-Tyne ..... 400 0 0

Mason, Plasterer, Slater, and Plumber.  
A. & R. Davis, Burnopfield\* ..... 278 8 6  
Joiner and Painter and Glazier.  
John Scott, Burnopfield\* ..... 176 14 7  
Total of accepted tenders ..... £455 3 1  
[A number of other separate tenders were received.]

CADOXTON (South Wales).—For the erection, completion, and maintenance of works required for the construction of two roads at Cadoxton, South Wales, for the Barry and Cadoxton Local Board. Mr. J. C. Pardee, Surveyor, Local Board Offices, Cadoxton:—  
Whitening and Improving Holton and Weston-road.—  
Contract No. 1.

W. R. Parker & Co. .... £5,355 14 11  
Alfred Elliott ..... 4,812 16 0  
T. Jones Davies ..... 3,890 0 0  
E. J. Ince ..... 3,760 18 3  
David Love, Cadoxton (accepted) ..... 3,515 2 0

Road from Court-road to Police Station.—  
Contract No. 2.

Alfred Elliott ..... 1,975 9 10  
W. R. Parker & Co. .... 1,817 2 0  
Jenkins Brock ..... 1,616 8 3  
T. Jones Davies ..... 1,470 19 2  
E. J. Ince ..... 1,437 4 5  
David Love, Cadoxton\* ..... 1,335 14 4  
\* Accepted, conditionally.

CROYDON.—For the completion of "Oxford and Cambridge houses," Birdthorpe-rise, South Croydon, for Mr. F. A. A. Rowland. Mr. E. C. Homer, architect, 99, Graham-street, E.C. 1:—

Staines & Son	£1,296 0 0
K. Eland	1,235 0 0
Smith & Son	1,175 0 0
Saunders	1,163 0 0
Chesam & Sons	1,100 0 0
Edwards & Turner	1,100 0 0
Batley & Linfoot (accepted)	567 0 0





**NEWCASTLE-ON-TYNE** (near).—For leading and laying 5,800 yards of cast-iron pipes and connexions between Atkinson-road, Benwell, and Newburn, Northumberland, for the Newcastle and Gateshead Water Company. Mr. J. R. Forster, engineer, Newcastle and Gateshead Water Company, Newcastle-on-Tyne.—

John T. Simpson.....	£4,203 0 0
Nicholson & Elliott.....	2,765 10 0
Smith & Gibson.....	2,677 10 0
John & Thomas Young.....	2,651 10 0
Thomas Bell.....	2,331 5 0
William Carr, Hexham (accepted).....	2,335 12 6
Gustavus Bailey.....	2,216 10 0

**NEW MALDEN**.—For the erection of Baptist Chapel, Kingston-road. Mr. W. H. Woodroffe, architect, 214, Great Dover-street, S.E.—

Roffey.....	£2,050 0 0
Smith & Son.....	1,995 0 0
Parker.....	1,943 0 0
Hards.....	1,333 0 0
Young & Lonsdale.....	1,764 0 0

**PONTYPRIDD**.—For building a workmen's institute and public hall at Ynyshir, near Pontypridd, for the Ynyshir and Watstown Public Hall Company (Limited). Mr. Charles Taylor, architect, 23, Duke-street, Cardiff.—

Johnson Bros.....	£5,887 10 0
Joseph Thomas.....	5,672 0 0
Ekers of W. Gradwell.....	4,870 0 0
C. Jenkins & Son, Ponty.....	4,900 0 0

\* Under consideration.

**PONTYPRIDD**.—For the erection of twenty-two workmen's cottages at Ynyshir, near Pontypridd, for the Ynyshir Building Society. Mr. John Bevan, architect, Mountain Ash.—

Edward Evans, Ynyshir, near Pontypridd (accepted).....	£3,150 10 0
--	-------------

[Five tenders were received, the highest of which was £3,860 total.]

**POTTERS BAR**.—For the erection of a new police-station at Potters Bar, for the Receiver for the Metropolitan Police District. Mr. John Butler, architect. Quantities by Mr. W. H. Thurgood.—

C. Barnes.....	£1,907 0 0
Patman & Potheringham.....	1,903 0 0
Hart Bros.....	1,900 0 0
J. Smith & Sons.....	1,927 0 0
Higgs & Hill.....	1,894 0 0
J. T. Chappell.....	1,893 0 0
Grover & Son.....	1,893 0 0
Scrivenor & Co.....	1,877 0 0
Nightingale.....	1,859 0 0
Kilbey Iron.....	1,850 0 0
Willmott & Son, Ponty.....	1,785 0 0

**SHEFFIELD**.—For the erection of lodge at Carbrook Recreation Grounds, Sheffield. Mr. Charles F. Wike, Borough Surveyor.—

Dutton & Evans.....	£563 0 0
John Eschby.....	545 0 0
John Morton.....	493 0 0
W. L. Smith.....	491 0 0
T. Cuthbert.....	467 0 0
J. Chambers & Sons.....	464 0 0
J. Mastin & Sons, Sheffield (accepted).....	453 0 0

**SHEFFIELD**.—For painting work at Lodge Moor Fever Hospital, Sheffield, for the Corporation of Sheffield. Mr. C. F. Wike, Borough Surveyor.—

Wm. Fuller.....	£210 0 0
M. A. Topham.....	200 0 0
G. Smith.....	197 8 0
A. Jubb.....	195 13 0
M. H. Thraves.....	188 19 8
A. Machin.....	170 0 0
F. Jackells.....	163 17 0
J. Pittrell & Co.....	155 0 0
Smith & Snape.....	150 0 0

**SHEPTON MALLET**.—For the erection of a minister's house at Shepton Mallet, for the trustees of the Rectory House. Mr. J. Ace Beynon, architect, Coleford, near Bath.—

Contract A.....	£920 0 0
Ford.....	884 0 0
T. Ashman.....	780 0 0
Jones.....	735 0 0
F. James, Junr.....	730 1 5
W. Tovey.....	711 10 0
Doddimead.....	659 14 0
J. H. Pullen (accepted).....	£50 0 0

Contract B, Boundary-walls, Entrance-gates, &c. Pullen (accepted).....

**STAFFORD**.—For excavating, paving, kerbing, channelling, &c., roads at Stafford, for the Corporation. Mr. W. Blackshaw, Borough Surveyor, Stafford.—

J. Frayne.....	£447 4 10
Bradshaw & Co.....	333 1 11
Burnham & Phillips.....	492 0 6
W. Moore.....	479 0 5
H. Newton.....	507 18 5
C. J. Nevitt, Stafford*.....	404 11 2

\* Accepted.

**SURBITON**.—For alterations and additions to "Saxony" St. Mary's-road, Surbiton, for Mr. J. E. Bowring. Mr. William Wallace, architect, 27A, Old Bond-street. Quantities by Mr. Walter Herring.—

Jarvis.....	£3,714 0 0
Fox & Co.....	3,676 0 0
Faulkner.....	3,663 0 0
Havell.....	3,458 0 0
Gregory & Co.....	3,357 0 0
Marriage.....	3,303 0 0

**WALTHAMSTOW**.—For building new class-room and teachers' rooms at the Gamuel-road (Girls' and Infants' School), for the Walthamstow School Board. Mr. W. A. Longmore, architect, 7, Great Alie-street.—

Barrett & Power.....	£635 0 0
Fuller.....	585 0 0
Challis.....	558 0 0
Taylor.....	540 0 0
Cracknell, Walthamstow (accepted).....	485 0 0

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# The Builder.

Vol. LIX. No. 2485.

SATURDAY, SEPT. 27, 1890.

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Hatchford, Surrey: Garden Front and Entrance Front.—Mr. Rowland Plumble, Architect	Two Double-Page Ink-Photo's.
Bablake Boys' School, Coventry.—Messrs. Giles, Gough, & Trollope, Architects	Single-Page Photo-Litho.
Cavendish College, Cambridge.—Messrs. Giles, Gough, & Trollope, Architects	Single-Page Photo-Litho.

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### The Architectural Education of the Public.



It has become almost a commonplace among those architects who take a serious view of their art, and regard it as something more than a means of making a respectable living, that there can be little hope of a general improvement in the standard of architecture in this country until there is a general public desire for better architecture, grounded on a more cultivated perception as to what architecture really means. It may perhaps be suggested that artists of every class are prone to think lightly of the public appreciation of their own art; and that architecture is no worse off in this respect than painting or sculpture. Admitting this to a certain extent, there is nevertheless some ground for considering architecture as a subject in which the public are specially in need of instruction. There is unquestionably a better general perception as to good and bad in regard to painting and music, for instance, than in regard to architecture, and there is, among well-educated people at all events, a respectable public opinion in regard to those two arts. There is far less in regard to sculpture; and in England at all events this art perhaps fares hardly better than architecture, so far as general comprehension is concerned: and for much the same reason. Sculpture is a much more abstract and less realistic art than painting. Architecture is more abstract than either, and appeals to a more purely intellectual perception. But commissions for sculpture are given commonly by persons who have some love of the art and some idea what they want from it. Architectural commissions are in many cases given by those who have only a utilitarian object in view; or who, if they have any idea of architecture before their eyes, only wish for a building which answers the requirement of being correctly designed according to one of the styles which they have heard of, or which modern custom has accepted as correct. Whether this latter system produces anything better than a mere utilitarian building depends almost entirely on the architect. If he is a man with the feeling of an artist, and who is something of

an enthusiast in his work, he will put into this merely imitative architecture a degree of refinement which will give it interest and value. If he is not, he will merely produce a bald and perhaps coarse imitation which will have no value or interest at all, but which will in all probability satisfy his client as well as anything else.

How are we to influence the public to care for, to demand, something better in architecture than this? For until they do demand it, there is little probability of a general improvement. This consideration forms the subject of two of the papers in the recently issued volume of the Transactions of the National Art Association; the second volume of the series, containing the papers read, and some brief notes of the discussions, at the Congress held at Edinburgh last November. We devoted some space to noticing the proceedings of the Congress at the time, and have no intention of going over old ground again. But the appearance and form of the volume recording the proceedings at that Congress deserve in any case a word of recognition. The volume, printed by the firm of Constable, is got up in such a manner as to render it worthy to be the record of an Art Congress. Not that there is any display about it, or anything elaborately ornate in the binding or decoration; but it is a thoroughly well-printed book, with a good type, a wide margin, and a study to arrange the page so as to produce a generally satisfactory effect to the eye. It is a book which not only contains a great deal that is worth reading, but one which is thoroughly agreeable to the eye, and presents a marked contrast in this respect to the printed page of the ordinary English books of to-day. The Editing Committee have done well thus to make their volume, a record of an Art Congress, in itself a work of art in the manner in which it is got up, thus rendering it a practical exemplification of one minor form of art, and one which is in general greatly neglected in the present day of rapid and voluminous putting forth of books. The whole spirit of the teaching comprised in the papers read at the two Congresses already held is to inculcate the idea that art does not consist in the production of pictures and sculpture only, but that the artistic spirit may be and should be shown in all forms of work; and the Edinburgh volume of Transactions is in

itself a most praiseworthy example of this spirit.

Having done this justice to the form in which the volume is produced, we will devote the rest of our remarks upon it to the papers which deal with the subject which is of the most direct interest to us, the means of developing and improving that general knowledge of architecture in which the English public is at present so deficient. This is dealt with in two papers under the heading "The architectural Education of the public," by Mr. Campbell Douglas and Mr. G. S. Aitken respectively. Of these two papers, the latter is the most direct and practical; both to some extent take the same ground, that architecture should be made a portion of general education, but the method of doing this is more practically dealt with by the latter writer.

Accepting the fact that the English public know little of architecture, as one on which all persons are agreed (for the average Englishman, so far from denying his ignorance of architecture, is disposed rather to boast of it), the two questions to be asked are, what is the reason for this exceptional ignorance, and what is the remedy for it. Mr. Douglas suggests, in regard to the first point, that the mere fact that architecture of some kind is one of the daily surroundings of all persons' lives leads them to think that they know all about it. All people are not brought up in the midst of collections of paintings or sculpture; but all dwellers in towns are brought up in the midst of collections of buildings, many of them more or less architectural in character; they are familiar with cornices and pilasters as every-day incidents, and cannot see that there is any mystery in the matter which should make it necessary for them to study it, and "people do not set themselves to learn anything for which they do not see any good reason." The result of this general familiarity with certain every-day forms of architecture is the same kind of acquaintance with it that the man had with literature, who found he had been "talking prose all his life" without knowing it. That man would probably have had little or no perception of refinements of literary style, nor would the man who had seen buildings every day of his life have necessarily any perception of the refinements of detail which make the chief difference between good and



bad architecture. He would recognise a general drawing of a columnar building as representing what he had seen; but if you were to show him drawings of various details, base-mouldings, ornamental details, &c., he would be quite unable to say whether these were correct or not, just as the man who had talked prose by habit would be unable to define correct grammar; or, as Mr. Douglas puts it, just as we might receive a general impression of passion and eloquence from a speech in a foreign language imperfectly understood, but without being able at all to discriminate whether it was good or elegant French, or German, or Italian, that we had been listening to.

That is the position in which average persons stand in regard to architecture; it is a foreign language of which they have only a general impression, without any knowledge of style or of grammatical construction. Mr. Douglas accordingly suggests that they should be taught the grammar of architecture. But is there a grammar of architecture? The phrase sounds well, but it will be rather difficult to tack a precise definition to it. Mr. Douglas puts it in this way:—

"The grammar of architecture consists largely in the intelligent use of such special features of style, arrangement, and shape of mass, as are found in piazzas, domes, minarets, campaniles, towers, spirals, &c.; but in those styles with which we have chiefly to do it consists mainly in the judicious use of such mouldings as those who are masters in the style have employed, thereby imparting a certain individuality and mode of architectural thought to that style."

This is rather vague, especially the term "judicious use," one of those useful phrases which it is always safe to employ, and which may mean anything. The writer goes on to illustrate his meaning by referring to the distinction between a Classic Corinthian capital and an Early French Gothic one; the man with only a general idea of architecture would regard them as much the same thing; the man who had studied detail at all would see a radical distinction in their mouldings and style of leafage design. But this is a perception as to delicacies of style; it is hardly analogous to grammar. Grammar, in language, is the arrangement and relation of words so as to correctly represent or symbolise processes of thought. To say "there is no houses" is bad grammar because it uses in one part of the sentence a word implying unity, and in the other a word implying plurality of the objects named, and these ideas are mutually exclusive and cannot be entertained together. But it can hardly be said that there is anything in architecture analogous to this intellectual necessity for correct grammar in dealing with mental processes. It has been thought incorrect and bad style, by some critics, to use coupled columns in Classic architecture; but their use does not suggest mental ideas which are mutually exclusive. As has often been pointed out by our ablest writers on architecture, there may be good or bad logic in architectural design,—the use of external features, for instance, so as to imply an interior plan different from the actual one; but this is not the same kind of fault as a grammatical one; bad logic may be expressed in perfectly good grammar. As far as architecture in general is concerned, therefore, it may be said that there is no such thing as a grammar of it to be taught. But there is something like a grammar of separate styles of architecture, or perhaps we should rather say each has its own idiom. The best and most consistent styles of architecture that have existed depend for their consistency and harmony of effect on the observance of a variety of rather minute refinements of detail, of which mouldings are the most important and, it may be added, the least understood of the people.

These elements of refinement and consistency of style are capable of distinct illustration and definition, and can be taught as a branch of knowledge, giving people a correct perception of the characteristics of various styles, taken separately. To give instruction in architecture on this principle is

easy enough, if people are willing to be instructed, and those who know at all accurately the leading features of the principal architectural styles will no doubt develop a better taste and perception in regard to good and bad style in architecture than those who have had no such training; but the teaching of separate styles has the radical defect of confirming the public in the idea, which many architects never emerge from, that architecture means the designing of buildings in some special and pre-ordained "style"; an idea which starts the learner at the outset on a wrong track, leading him to put the secondary before the primary element in architecture.

In any attempt at general or primary instruction in architecture, therefore, a certain general instruction in what may be called elements of architectural design should precede the study of special styles. This is not quite so simple a matter as it appears at first sight, because though there are some broad elementary principles which are felt to be true by all real designers in architecture, they are not altogether susceptible of accurate definition; they cannot, for instance, be formulated into a series of necessary and undeniable axioms such as those which precede the problems of Euclid; their nature is æsthetic rather than scientific; and abstract æsthetic principles form a somewhat thin atmosphere for a beginner to inhale. The best basis for a primary instruction in architecture therefore appears to be, to regard the art from the outset as the expression of construction, and to teach the simple and fundamental principles of building construction in the first instance, as the basis of the whole. A study of the details of the leading styles of architecture, always with reference to their constructive basis, will then insensibly develop in the learner, along with the knowledge of the facts of a style, a perception of the manner in which architecture expresses construction, which the pupil may be afterwards able to apply for himself in a broader and more general sense; while the study of the details of the purest styles of the world forms at the same time a valuable training in the sense of architectural refinement and consistency of expression.

Elements of construction, then, followed by elements of leading styles, seems to be the only practical form which a primary instruction in architecture can take: and when and how can this instruction be conveyed? Mr. Aitken's suggestion, in which we in the main concur, is that "architecture should be recognised as one of the indirect branches of study in the tuition of the young." We do not know exactly what he means to imply by the term "indirect," unless it be that architecture should appear as what is called in a school syllabus an "extra." That perhaps may be unavoidable at the outset, and it may be well to get even that in as the thin end of the wedge, but it is rather of the essence of primary instruction that there should be no "extras," and that whatever subjects are desirable for laying the foundation of a good education should be a portion of the fixed routine of teaching. The simple kind of elementary teaching which we have advocated need not, in competent hands, take up any disproportionate amount of time and brainwork. Its adoption would probably, in the course of one generation, work a wonderful change for the better in the general level of architectural taste and perception in this country, besides tending to arouse an interest in the subject for its own sake, and putting an end to that "don't-care" attitude on part of the public towards architecture, which is perhaps the greatest of all obstacles to the general improvement of our standard of national architecture.

Mr. Aitken's paper contains some other excellent and practical suggestions for increasing the interest of the young in architecture, during the further progress of their education. He suggests, for example, that in connexion with the study of history, illustrations of the principal buildings of the cities or countries whose history is being read,

should be exhibited to the students, and their origin, uses, materials &c. should be described; we might add, that a word should be given by the teacher, or required from the more advanced classes of students, as to the style of such a building, its position in architectural history, its historical connexion with previous forms of architecture. He suggests that instruction in drawing might be made the opportunity for combining instruction in architecture, by giving the pupil pieces of good architectural detail to copy, with the saving clause (most necessary to bear in mind) that "no copy for imitation should be placed before the pupil which is not in itself a work of art," an injunction which cannot be too often and too strongly insisted on. And, to sum up the beneficial influences brought to bear on the pupil's architectural perceptions, "With all this systematic reference to the art of architecture in the lessons of the school, it is of course taken for granted that buildings in which that instruction is given are models of high quality in art. The school should not only be well planned, but also ably designed." This is a good deal to "take for granted;" but, as the writer of the paper admits, a certain number of well-designed schools have been built under recent influences; and we may add that even where the school building is notably deficient in architectural beauty or good taste, it might be possible still to turn it to a melancholy account in an educational sense, by adducing it as an example of deficiency or absurdity in architectural treatment.

In the first of the two papers we are referring to, by Mr. Douglas, something is said as to the value of books on architecture in promoting a more general knowledge of the subject. We fear this has not been hitherto a very important influence. Books on architecture are seldom read except by those who have already developed some interest in the subject; to the ordinary reader they are not attractive. An exception must be made, of course, in regard to the publications of Ruskin, which have the opposite fate; they have attracted general readers by the eloquence of their style, is much as they repel better informed people by the nonsense and clap-trap they contain. It is to be regretted that they should have been recommended at the Art Congress as a means of architectural education. Ruskin's writings in regard to architecture have had the effect of conveying to the popular mind, to a certain extent, the idea that architecture is a subject worth being enthusiastic about, and that is something; but their merit in this respect is more than counter-balanced by the false teaching they contain. A protest was made at the time against the recommendation of them as aids to architectural education, which may be repeated here. The "Seven Lamps" contains a certain amount of truth about architecture expressed in a vague rhapsodical manner, and intermingled with a great deal of idle though eloquent verbiage written purely for effect. "The Stones of Venice" is simply a huge, elaborate, and tumultuous rhapsody, containing isolated passages of splendid literary eloquence, but worse than useless, absolutely mischievous, as a guide to the study of architecture, being crammed with misrepresentations, false rhetoric, accidentals of architecture treated as essentials, corrupt varieties of style represented as central types &c., and marked by absolute ignorance of the constructive basis of architecture. Its value is purely and entirely literary and poetic, and has been a good deal over-estimated even in that respect. From an educational point of view it is one of the most mischievous and misleading books on architecture ever written.

TRAMWAY EXTENSION AT HUDDERSFIELD.—On Tuesday last Major-General Hutchinson, C.B., one of the Inspectors from the Board of Trade, paid a visit to Huddersfield to inspect an extension of the tram system from Moldgreen to Waterloo, on the Wakefield-road. The extension is a mile and 25 yards in length, and the line has been constructed under the superintendence of Mr. R. S. Dugdale, C.E., the Borough Surveyor.



## PUBLIC WORKS, IRELAND.

ACCORDING to the last report of the Commissioners of Public Works in Ireland, dated July, 1890, the large sum of 424,800*l.* was appropriated to the construction and maintenance of works for the amelioration of the conditions under which people live in that country, during the year ending March 31 last, consisting of the sum of 69,672*l.* for inland navigation, harbours, and labourers' dwellings under the Acts of 1866 and 1885; of 228,853*l.* for works under the Public Health Acts, Asylum Buildings, Labourers' Acts of 1883 and 1885, dispensary houses, &c.; of 90,582*l.* for river drainage and land improvements; and of 35,693*l.* for miscellaneous works. A larger amount was appropriated in the previous year, viz. 564,850*l.*

These annual amounts are loans from the Treasury. The Commissioners of Works in Ireland divide them into four classes—(1) Loans secured on undertakings, (2) Loans secured on rates, (3) Loans secured on lands, and (4) Miscellaneous loans. The advances on the security of the undertakings have been on a very limited scale during the last year, but they include 3,500*l.* to the Lagan Navigation Company, to enable them, in pursuance of the Act of 1888, with the sum of 7,000*l.* contributed from other sources, to restore the works of the Ulster Canal, and give a depth of 5 ft. of water from end to end, a length of forty-eight miles, which will improve the water communication between Belfast and the Lough Erne. The loans for harbour works comprise 18,000*l.* to the Waterford Harbour Commissioners.

Under the Labourers' Dwellings Act of 1866, the powers of which were enlarged by the Housing of the Working Classes Act of 1885 for a period of three years, and further extended for the three years terminating on December 31, 1891, the sum of 46,819*l.* was appropriated during the last year. In the previous year the sum was 53,753*l.* The loans for the purposes above named are secured on the undertakings. Those made during the last year which are secured on rates, were *six* advances for road works, *one* for an industrial school, *forty-eight* for sanitary purposes, *three* for repairing fishery-piers, *twelve* for improving the accommodation of county lunatic asylums, *two hundred and five* under the Labourers' Acts of 1883 and 1885, and *eleven* for building dispensary-houses. The forty-eight loans under the Public Health Act for sanitary purposes amounted to 57,300*l.* In the previous year the amount was 150,384*l.* The 57,300*l.* last year comprised 38,695*l.* for water-works, 8,720*l.* for sewerage, 2,110*l.* for burial-grounds, 4,375*l.* for footpaths, 2,900*l.* for municipal buildings, 4,500*l.* for public parks, and 1,000*l.* for a fever hospital.

In like manner the sum of 89,682*l.*, sanctioned last year under the Labourers' Acts, 1883 and 1885, was very much less than that of either of the two previous years, which was 463,261*l.* in the year ending March 31, 1888, and 188,742*l.* in that ending same date, 1889.

The number of dwellings, upon which the sum of 46,819*l.* was expended, is 603, being an average of 77*l.* each. The Commissioners say:—"To secure that the loans sanctioned shall be applied to the erection of such dwellings as come fairly within the scope of the Acts, and are in every respect suitable to the means and requirements of the labouring classes, it is made a condition with the borrower that the rents to be charged are not to exceed certain specified sums, such rents being fixed on consideration of the locality and the class of labourers for whom accommodation is required. This arrangement has had the effect of limiting the cost of the erection of dwellings built under the loans referred to, and thus securing, as far as practicable, their being permanently available for occupation by the labouring classes."

The sum of 90,582*l.* named as for land improvement, is chiefly for loans to tenants, the owners not now having much interest in the improvements.

Under the head of light railways, the tramways constructed under the authority of the Acts of 1860, 1861, and 1883 are included. The total mileage of projects guaranteed is 307 miles, of which 172 are opened to the public, 61 miles are in course of construction, and 74 are not commenced, although the Orders are still in existence. Under the Light Railways Act of 1889, for the development of fisheries and other industries, sixteen were scheduled in the *Dublin Gazette* in November and December last, but the money voted by Parliament will not be sufficient to construct all the lines scheduled.

## NOTES.



FURTHER contribution\* to the literature on "Building in Earthquake Countries" has recently been furnished by Professor John Milne, F.R.S. It contains much useful information on the subject, not only in respect of the construction of earthquake-proof buildings in Japan, with which the author is especially acquainted, but of the building regulations drawn up for Ischia, Mania, Norica, &c., by their respective Governments. Commencing with the methods of choosing a building site, he shows that this may often be determined by taking the results of experience as a guide. Earthquakes are more often noticed on high- than on low-lying ground; but, in spite of this fact, the low, soft ground is in general conducive to greater destruction. As a rule, hard, high ground is the best to build upon; very wet ground, and notably ground that is marshy, is as insecure against earthquakes as in ordinary cases. Earthquake action is extremely local in character. Amongst other things it was found, as the result of experiment at the late Imperial College of Engineering, at Tōkiō, that of two similar houses in the compound of that establishment, which were situated at a distance of less than 800 ft. apart, one of these houses might be destroyed by a given earthquake, and the other suffer little, if any, damage,—so clearly pronounced was the difference in motion on two sides of that piece of ground. There can be no question, therefore, of the utility of a detailed seismic survey of earthquake-stricken countries, and especially in the cities. One of the results of a general seismic survey of Japan shows that certain parts of that country are comparatively free from earth-movements,—a result of no little importance. Houses, naturally, should not be built near the edges of cliffs or scarps. Dealing with the value of the records of the seismograph, Prof. Milne says he is "of opinion that an earthquake with a 25-millimetre (0.984 in.) amplitude and an ordinary period would wreck the half of London." Great advantages might be gained by giving buildings deep foundations. The Ischian regulations state that buildings should be founded on solid ground; where this is impracticable, however, they provide that a platform of masonry or cement should be formed, the thickness of which varies with the height of the structure to be placed upon it. The author says that loose foundations might possibly be employed for small, light buildings erected on soft ground; but for ordinary dwelling-houses, and especially for heavy structures covering a considerable area, solid continuous foundations in the hardest ground, and, if possible, surrounded by a free area, are preferable. Arched construction, not being suitable to withstand horizontal stresses, is to be dispensed with as much as possible. In regard to the regulations made for Ischia and Norica, which state that doors, windows, or other openings should be placed vertically above each other, Professor Milne remarks that, in his opinion, they "ought not to be above each other, but so arranged that lines of openings when regarded

vertically should be as much broken as possible.<sup>b</sup> Constructors should avoid coupling together two parts of a building having different vibrational periods, or else couple them together so securely that they shall move *en masse*. Chimneys should be made short and thick, and not loaded with heavy coping stones. Naturally, roofs should be made as light as circumstances permit. When a building with a heavy roof is suddenly moved forward, the roof by its inertia tends to remain at rest, and destruction ensues. A case is cited where roofs of considerable span were built so that they rested freely on the supporting walls, and it is shown that, although having experienced many severe shakings, they remain uninjured. Walls ought to be built light and strong, and not loaded in their upper portions with copings and balustrades; whilst it is not desirable to carry any building higher than is absolutely necessary. The Ischian regulations give a limit of height of 32.8 ft. for ordinary buildings, and those of Liguria allow 49.2 ft. "The length of a wall should not exceed twice its height, unless supported by a buttress; its thickness must be one-fifth of its height." Balconies in any form are objectionable features in a house constructed to withstand earthquakes. It is also suggested that buildings should preferably be rectangular in plan, because when they have many wings, &c., the different parts of the structure do not vibrate in unison. The author then describes the construction of floors, ceilings, staircases, materials, &c., all of which might call for special comment. In dealing with types of construction, he says, "One of two systems. . . . can be followed, namely, either to give so much rigidity to a structure that it may be likened to a steel box; or to erect a light building which has so much flexibility that it may be compared to a wicker basket." Prof. Milne is certainly to be congratulated on the production of a paper which cannot fail to be exceedingly useful to all architects or engineers practising in, or designing structures for, countries visited by earthquakes. As a matter of practice it might often be found impossible to comply with all the rules laid down, for, if they were observed in their entirety, the earthquake-proof building of the future would not, apparently, possess much artistic charm. At the same time, the suggestions, founded as they are in the majority of instances on actual experience, and as a result of much painstaking observation, should certainly be borne in mind and applied wherever practicable.

IT is certain that one result of the present epidemic of strikes will be a great increase in labour-saving machinery and in machinery to economise working. There is an untold amount of mechanical ingenuity eagerly seeking after new inventions, and this stream of talent will be now diverted more especially towards discovering inventions by which the extra cost of labour will be minimised. We should be the first to welcome combination for purely legitimate purposes, but where it is used rather for the purpose of crushing capital and making labour supreme, we equally welcome any means which will enable capital to hold its own. The great mistake which the trade union leaders make is to suppose that either unreasonably high wages or arbitrarily shortening the hours of labour will, in the long run, permanently benefit the labouring classes. For example, if the price of coal is raised, then at once means are sought to economise its consumption, whereby the extra cost per ton shall be met by smaller quantities being consumed. When such a general economising becomes established, it is obvious that less coal is required, and that the volume of wages paid to coal-miners is diminished. Hence either wages must fall, or a certain number of men must drop out of that particular class of workers. In either view, the ultimate result of the rise is not more favourable to the workmen. But care must be taken not to

\* Min. Proc. Inst. C.E. vol. C (1890), "Selected Papers," p. 326 *et seq.*



suppose that such effects will result in a moment. As an example of coal-saving which recently came to our knowledge, we may mention the case of a tannery. In order to save the ever-increasing coal-bill, a furnace was devised in which the many tons of tan which had hitherto been practically wasted are now consumed, whereby a great saving in coal is effected. This is typical of what is going on slowly all over England. Mechanical teaching and thought has now brought modern brains to such perfection in this particular intellectual groove that there is hardly any limit to the increase of labour-saving appliances.

THE quinquennial valuation of London is naturally causing much dissatisfaction. The present revaluation was certain to do this. In most parts of the West End of London house property has fallen in value. The Assessment Committees have, however, very generally raised the rateable value of houses. In many cases it is probable that houses have been assessed below their value before, but the householder, when his property is less valuable than it was, is no better pleased at a higher valuation because the valuation was rather below the mark before. In many cases, however, the Assessment Committees have probably trusted to the general disinclination of the average householder to do more than grumble, and have screwed up the valuation beyond what the fall in value of property in West London would warrant. It seems very likely that many appeals will ensue, and we should not be surprised were considerable restrictions made in many valuations. While touching on the point of rates, it may be well to call attention to the ridiculous anachronism which exists under which notices as to valuations, rates, serving on juries, and so forth, are posted on church and chapel doors as the chief place of exhibition. There is no reason why they should not be exhibited there, in case they attract attention, but they should in villages be also placed on the village school, and, primarily, both in towns and villages, on public notice-boards erected for the purpose. Many churchyard gates are locked on week days, and over and over again valuations are raised and not objected to because they have not been seen, and so the time for objecting has lapsed. In France the public notice-board is seen in every village guarded by a wire screen. This is the proper system.

ON Sunday next, Sept. 28, the Turin Architectural Exhibition will be opened to the public. We have reason to believe that this exhibition will be a success, thanks, firstly, to the arduous work of the president of the committee in charge, and secondly, to the valuable assistance rendered by the Italian Government. According to the *Secolo*, of Milan, most of the foreign municipal authorities invited to exhibit have accepted the offer; so that, besides the numerous Italian towns represented (among which we may especially mention Rome, Naples, Milan, and Florence), quite an international collection of examples of municipal work will be on view; capitals such as Vienna, Berlin, Constantinople, Warsaw, Stockholm, Edinburgh, and London taking prominent positions among a host of provincial cities. As to Italy itself, we need only say that a complete collection of plans of the historical buildings of the country will be hung in the central hall of the exhibition buildings, where they have been arranged by order of the Ministry; and that Section IV. shows the plans of the underground ways of the more important towns. Of special interest will be the large number of specimen copies of publications, photographs, and photolithographs sent in from all parts of the world. The Minister of Education, Sig. Roselli, will open the exhibition in person.

IN Italy architectural gatherings, not unlike the biennial congresses held in Germany, have been known for many years, and we

hear that at the last one, held in Venice in 1887, Palermo was selected as a meeting-place for the congress which is to take place in the autumn of 1891. Owing to Palermo having the special attraction of an Italian National Exhibition on a large scale, it was decided to make the coming gathering an "international" one. The International "Congress" of Architects, as it is to be called, is intended as a serious business-like affair, combined, however, with some interesting sight-seeing and official banquets. The congress, which, according to the preliminary "programme," is to last not longer than twelve and not less than eight days, will have its seat in the university buildings of the town, and here the different sections (Architecture proper, Construction pertaining to military, factory, and Civil buildings, Sanitary Engineering, and Civil Engineering) will each have their own series of lectures, debates, &c., the subjects of which, still under consideration, are not only to include theoretical, but also practical items, special explanations (in some cases by the designers personally) being given of the larger monumental erections of the last decade. As to the sight-seeing part of the programme, systematic excursions, under able guidance, will be made inland, and great care will be taken that the visitors shall have easy access not only to the archaeological but to the natural points of interest on the island. Particulars will be published at a later date. The Duc di Verdura has accepted the hon. presidency of the local managing committee.

THE great and picturesque building which has given the name of Christ-Church to a small hamlet in Hampshire has long been in a serious and even dangerous state of decay in many places, and, as we noted recently, is being slowly repaired by little and little as funds can be procured, under the direction of a Bournemouth architect, Mr. Burton, with the concurrent advice of the vicar, Mr. Bush, who is very well acquainted with his church. Few people are probably aware of the great difficulty in the way of carrying out even the degree of repair necessary for the security of the edifice and its fitness for public worship. An edifice on the scale of a second-class cathedral, Christ-Church is worse off than many a small parish church, its permanent endowment representing in fact a *minus* quantity after the first ordinary expenses of carrying on the regular services have been discharged. A local committee has done all it can for a long time towards collecting funds and contributing out of the private means of its richer members, one or two individual members having undertaken each the cost of repairing the most dilapidated piers and giving them the solid concrete foundation necessary for their permanent security. The decayed roof over the north transept and that over the Lady chapel "loft" (the low compartment above the vault) have been replaced by substantial new oak roofs, and the roof of the choir resealed. The most pressing matter now is the nave roof. This was originally an elaborately-decorated open-timber roof, now concealed by the timber and plaster imitation vaulting put up in the early part of the century. The ancient roof principals are in a dangerous state of decay, and are being rendered safe for the time by the insertion of new collars strutted up from a point on the walls below the bearing of the old roof, and by strutting up again from these to the bearing of the purlins. Only a portion of this work, however, is yet done, and any hope of obtaining the funds for reconstructing the roof entirely and removing the timber vaulting seems adjourned *sine die*. The sham vaulting makes a dangerous mass of inflammable timber cradling, and the view between this and roof shows a state of things which ought to be put an end to as soon as possible. There is no desire for "restoration" as such, except for the reconstruction of work that is decayed beyond the possibility of being permanently retained. We recommend the matter to the

interest of any wealthy readers who can afford to contribute something substantial to arrest the threatened decay of a great and most interesting mediæval church.

IN connexion with the operations in constructing the Chambers Memorial Chapel in St. Giles' Cathedral, Edinburgh, the remains of a fine window in the Perpendicular style have been laid bare. The window is in the east wall of the north transept, and overlooks the small gallery above the north doorway. It is to be carefully restored, and will be retained in its position between the Memorial Chapel and the gallery. The jambs of the window have the large shallow mouldings of the style, with moulded bases and carved capitals. There is an elaborate battlemented transom which remains in a remarkably good state of preservation. Above the window, parts of the original corbelling supporting the roof parapet have been found, as also a lion's head and rosette, which are to be preserved and built into the responds of the arch between the Cathedral and the Memorial Chapel. From an archeological point of view, one of the most interesting discoveries is a Norman capital, which is the oldest piece of masonry yet found in the Cathedral.

A SHORT report on an outbreak of fever at Northport Hall, in the Holywell Rural Sanitary District, has been made to the Local Government Board by Mr. Spear. Northport Hall consists of three or four rows of cottages situated at wide intervals by the roadside, and is described by the Medical Officer of Health and Inspector of Nuisances as one of the most troublesome places in the neighbourhood in regard to the maintenance of cleanliness. The report, however, proceeds:—

"The inhabitants have, in fact, little opportunity of acquiring habits of decency and cleanliness. There are no proper means of drainage. Liquid sewage is allowed to flow for the most part into the roadside gutters, or collects in pools outside the dwellings; solid filth is deposited in dilapidated and foul privy-pits, which are rarely emptied, and the coverings from which are occasionally to be seen even on the surface. Water has often to be fetched by hand from quite unreasonable distances, and is only then procurable from dip-wells or roadside troughs, doubtless more or less liable to surface contamination."

The fact that water is only to be procured "from quite unreasonable distances" is a frequently recurring cause of evil mentioned in the Local Government Board reports. Unless people have a supply of good water brought within easy reach of them, it is idle to expect cleanliness. The result in this case was typhoid fever.

A CORRESPONDENT sends us an advertisement of the Awre Local Board for a "competent person" for the office of Working Surveyor and Inspector of Nuisances. We read that "the salary as Inspector of Nuisances will be 17*l.* per annum, and as Surveyor 16*l.* per week. The person appointed will be required to labour manually, devoting his whole time to the duties of the offices, which will be those prescribed by the Public Health Acts, the Highway Act, 1835, the Regulations of the Local Government Board, and the by-laws now or hereafter to be in force, and adopted by the Local Board. The population of the district of the Board is 1,179, the acreage 4,093, and the mileage of the roads over which the surveyor will have control is 10½." It is not surprising, when this is the way that such work is provided for, to read such frequent complaints as we do in the Local Government Board Reports as to the inefficient way in which sanitary inspection is carried on in many rural districts.

THE 1st of October will be memorable in railway history, for on that date the hitherto exclusive "Flying Dutchman" will succumb to the levelling influence of the bold policy initiated some eighteen years ago by the Midland Railway Company, and will be available for third-class passengers. The Great



Western management have had to break with the traditions of nearly half a century in thus catering for all sorts and conditions of men, and in taking this action they have no doubt been stimulated by the recent efforts on the part of the London and South-Western to improve their service to Exeter. The fact of the announcement being made a week or two beforehand furnished the *Times* with a text upon which to enlarge upon the unreasonableness of the delays which usually occur in letting the travelling public know of impending changes. A remark to the effect that railway authorities seem to take a delight in stealing a march upon the public by delaying the publication of their time-tables till the last moment brought Mr. Cook, of tourist fame, to the rescue, with an explanation. According to Mr. Cook, their real object is to steal a march upon their competitors, — a railway manager being bound, in the interests of his company, to keep competitive managers in the dark as long as possible when bringing out a fast or improved service. Certainly, this explanation appears a perfectly reasonable one, though it will hardly reconcile the aggrieved section of the travelling public to the late appearance of the time-tables. The shortcomings of railway companies is a proverbially favourite theme of correspondents to the *Times*, and these gentlemen have had a good innings lately, all the old grievances being well ventilated. A writer in last Tuesday's issue pertinently remarks:—"If it is a fraud for me, holding a third-class ticket, to travel in a first-class carriage for my convenience, it is equally a fraud on the part of the company to take my first-class fare and give me third-class companions." This is logical enough, and there is no doubt that the latter fraud is perpetrated systematically on many lines when there is anything like a crush.

A PAPER by Mr. G. N. Hooper, read before the Society of Arts, on "Carriage-building in England and France, and the Traffic of the Streets," has been republished. It gives a number of interesting details in regard to the progress of carriage-building, and the comparison between French and English work is especially valuable. Some of the remarks in connexion with the streets of London are, however, of more interest to our readers. It is curious to observe how one system sooner or later affects another. Thus the introduction of wood and asphalt pavement has produced the india-rubber tyre to the wheel,—a method which Mr. Hooper considers likely to increase. Again, too, it is important to bear in mind that bad roads mean extra wear and tear of vehicles, and thus when the householder grows too economical in regard to the taxes which are to be spent on roads and streets, he should remember that it is only by having good streets that street-locomotion can be made cheap. Low fares and great wear and tear of vehicles are incompatible. On another point we thoroughly agree with Mr. Hooper,—that there is unnecessary wear of the London streets by market traffic. Much vegetable and other material is carried to Covent Garden and Smithfield, only to be brought back to the suburbs. Several district markets are needed in London.

PROFESSOR ROGER SMITH announces as the subject of the usual public lecture with which he opens his courses at University College, "The Technical Education of Architects." The lecture is fixed for Thursday evening next, October 2, at 7.30 p.m. We understand that in the course of the lecture some remarks on the "Curriculum" now under consideration at the Architectural Association will be made.

A FIRM of tile manufacturers, whom we will not further advertise, are circulating a pattern-sheet of their tiles among architects, with the memorandum scrawled in blue pencil across it—"Fifteen per cent.

commission allowed to architects only." As these manufacturers are evidently very desirous to get their goods under the favourable notice of architects, they ought to be obliged to us for telling them that they have taken the wrong means of doing this by circulating among the profession an offer which the respectable members of it regard as a most improper one. We received on the same day several letters from architects enclosing this circular and requesting us to comment on it. The manufacturers who have sent it had better withdraw and apologise for their offer of a bribe to architects to use their tiles.

WE have received in a pamphlet form an illustration and description of the terracotta bas-relief placed over Mr. Heath's hat shop in Oxford-street. We have before noticed with commendation this work, which is no doubt a form of advertisement, but a form so far superior to most of those employed in the present day that we cannot but hope that it may constitute an example to be followed in other instances. The frieze is modelled by Mr. Benjamin Creswick, of Sutton Coldfield, and commences with a figure of St. Clement, who is said to be the patron saint of hatters. Other panels represent the granting of a Royal Charter by King James to the hat-making industry; the unloading of fur-wool from a ship; the old process of beaver and felt hat-making. After these follows the name of the firm, and the corresponding right-hand portion of the frieze is occupied by representations of the modern processes of hat-making. The groups are spirited in modelling; we do not know that we should have liked the realistic treatment employed had the work been life-size; but on the small scale adopted this passes off better in sculpture than on a life-size scale; and the whole thing is a credit to the tradesman who wished to illustrate his business in an artistic manner, and to the artist who carried out the idea.

IN reference to the view of the interior of Lower Brixham Church, as proposed to be rebuilt and enlarged, which was published in the last number of the *Builder*, the vicar (the Rev. Stewart Sim) writes that the rebuilding of the church was first undertaken as a memorial to the Rev. H. F. Lyte, the author of "Abide with Me," and of other hymns well-known in English churches. Mr. Lyte was the first incumbent of Lower Brixham, and was there for twenty-five years. The parish, the population of which consists almost entirely of fishermen, is a very poor one, and it is exceedingly difficult to collect funds for the completion of the church. The vicar hopes that some of the many thousands to whom Mr. Lyte's hymns have become almost as household words may be willing to contribute something towards the completion of the church in his former parish.

#### EXCAVATIONS AT TEL-EL-HESY.

WE have become accustomed as each autumn comes round to look, as to a fixed institution, for an exhibition of ancient relics gathered by Mr. Flinders Petrie in the East. These present to us year after year something eminently worthy of study, and always different. We are sure to find something not hitherto known which indicates how far back must be placed the matured works of human skill and industry. One year we have the results of unearthing an unknown town; another year, a cemetery containing painted portraits of the people interred; another, the discovery of an important Biblical site. These researches, carried on by a single enthusiastic man, are worked out with all the acumen that facile knowledge and love for the work can prompt, while the happy choice of sites to be operated upon is made in a spirit but little short of inspiration.

This year's exhibition, which will continue open at the Oxford Mansion, Oxford-circus, until October 11, is in no way of less interest than any of the previous displays. In some respects it exceeds them, for light at last has been thrown, by Mr. Petrie's excavations, upon the remote past history of one of the cities of

Judea. The collection fills three rooms, the two principal ones containing Egyptian works of great interest, to which we propose again to refer. The third room, of small dimensions, is filled with objects of a very varying class, the greatest bulk of them totally different from the Egyptian articles. They are the first relics that have been brought to light of the early inhabitants of Judea, and, although at first sight their aspect does not arrest attention, yet their importance is only equalled by that of the momentous events of which these feeble articles are mute but eloquent evidences.

It is many years since travellers in the border-land country of Palestine have reported the existence of many artificial-looking mounds, called "tels" by the Arab tribes inhabiting the country, and these have long been supposed with justice to represent the sites of fortresses or habitations of by-gone times. Strange to say, no systematic attempt has hitherto been made to investigate any one of these mounds, although the usual system of erection practised in the East is very encouraging to the explorer—for he knows that the Arab builder, at least of today, seldom or never clears away the remains of the structure which he would rebuild. He constructs his new work upon the old. The site of a town or village thus in time rises above the original level; and the explorer has the happy supposition, to encourage his work of research, that what is being done now, has most probably been done for generations upon almost every Eastern site. He will find old, and still older relics, buried beneath each stratum that he may be able to dig through.

Mr. Flinders Petrie has the credit of being the first systematic explorer of the first of these mounds of Judea, and, although the means placed at his disposal were very limited, both as regards time and expenditure, yet, coupled as these works have been by his usual happy choice of position, the results obtained, shown in the little room by permission of the Palestine Exploration Fund, are extremely encouraging.

One of the principal of the "tels" which dot the plains of Judea is that of Tel-el-Hesi. It is a conspicuous object in the open, rolling country, standing as it does on a range of the low-lying hills of the fertile district, now almost without any settled village, but which at some period must have been very populous. This is sufficiently attested by the existence of the mounds already referred to, and by other sites where ruins (Khūrbēh) still exist. The Arabs, to this day, place this word as a prefix to the names of the sites, and they are extremely numerous. Khūrbet Tannar, Khūrbet Hazzārah, and Khūrbet el Wahashiyyeh, are all within sight: while Khūrbet 'Ajlan, a large site, is only a mile and three-quarters away from it. The whole of these four places can be visited by a walk of less than three miles from Tel-el-Hesi to Kh. 'Ajlan. Others, apparently sites of importance, are within easy distance, of which Tel-en-Nejjleh must be mentioned, since it is a large mound, the site of a place of consequence, and but three miles and a half away to the south-east. No roads exist, but many trackways meet close to Tel-el-Hesi, and some of these doubtless mark the courses of ancient roadways. A fine Roman road has led northwards through Judea, and is still traceable, the nearest point to our Tel being at Beit Jibain (the ancient Eleutheropolis), which is about eleven miles distant as the crow flies. Two roads branch off westwards in the direction of the Tel, but come to an end four or five miles from it, and are only continued as trackways. One of these, at any rate, if not both, the road two miles to the south of Beit Jibain, is likely to be of Roman construction, since it branches off in a curved line, which appears to be part of the course of the main Roman trunk road from which it separates.

The questions naturally arise, What was the ancient name of the Tel, and if so, has the site played any part in ancient history? There have been many conjectures, but that which may best commend itself to us is briefly stated in the "Survey of Western Palestine," the well-known series of volumes which contain the admirable and painstaking labours of the Palestine Exploration Fund. "The name approaches that of Lachish, with the substitution of a guttural for the Hebrew Caf, as in the case of Michmash." The position, too, at the entering in of Judea would also agree well with the locality in which we might expect to find it. Lachish fell before the children of Israel, and

by Divine decree it was utterly destroyed B.C. 1451. Rehoboam, however, fortified it in as one of his cities of Defence, circa 975 B.C., and it was to Lachish that King Amaziah fled, and where he was killed, circa 825 B.C. It was here that Sennacherib stayed, after its capture, when he received messengers from King Hezekiah at Jerusalem in 713 B.C. This is, in brief, the history recorded in the site in later times, and we are at a loss to know from recorded history whether or not it continued to exist as a town after the time of the captivity.

The mound, which is 340 ft. above the level of the Mediterranean, measures about 200 ft. square, with a flat plateau on its summit, and it rises to a height of 120 ft. in its highest part above the level of a small stream, which runs along the south and east sides, and which in course of ages has completely undermined and laid bare the whole of the eastern side from base to summit.

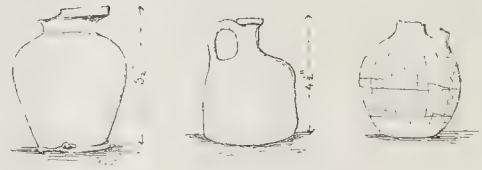
Mr. Petrie commenced his researches on a site not far distant, known as Umm el Lagis, which was supposed to contain the elements of the name Lachish, where he soon became aware that but little results would be obtained. Wishing to husband the resources at his command, he turned his attention to Tel-el-Hesi, where he at once happily turned to good account the overthrow of the side of the hill by the action of the stream. It gave him, in fact, a complete section of the mound without the labour of excavating it. Huge fragments of walls were seen projecting from its sides, although, being constructed entirely of sun-dried bricks, and covered with the deposits of similar material washed down the sides of the hill by the rains and storms of generations, it required a critical eye to trace which of the clay masses were constructional, and which was merely deposited, a task rendered all the more difficult by the decay of the facework. Finally, it was discovered that on a natural plateau, about 45 ft. above the existing level of the stream, existed a massive wall still more than 20 ft. high and about 30 ft. thick. This was traced for a considerable distance, and it is assumed, naturally enough, to be the earliest wall of enclosure. Above this wall is a second one, also built of sun-dried bricks and of somewhat less size, still about 10 ft. high. Remarkable to say, above this again, still slightly within the area, thus circumscribing the space enclosed, is a third thick wall.

These indications appear on the whole of the north side. But their continuity is attested by a few other evidences, on the south. But the topmost wall was traced along the remaining three sides and found to be of irregular figure, terminating in what was probably a tower at the north-west, with an entrance at the south-west, approached by a flight of steps arranged up the slope of the mound, enclosed by a curtain wall built along the slope, the base of which consists of masonry; the stones being worked with a draft around each, the central portions of the face being rough,—merely hammer-dressed, to use our modern term.

The irregular course of the upper wall was made out by Mr. Petrie under no small difficulties, for the crop covered it when it was first known to exist. Fortunately, the harvest was at hand, and as this was gathered trial holes were made from point to point rapidly, as soon as the ground was cleared by the reapers, the angles calculated, and the course of the wall determined.

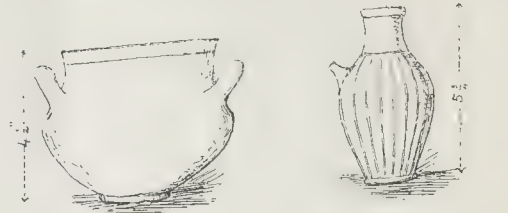
The interior of the mound proves to consist of the remains of town upon town. Of these the lowest ranges with the top of the lowest wall. Above this there is indication of the partial use of the site by some nomadic population, too ignorant to construct buildings systematically, for there is evidence that their houses were built of small stones gathered from the brook, and they now lie in a well-defined section across the mound. Then must have followed a time of entire abandonment of the site. This is proved in a curious manner. A layer of bush ashes is found covering it. These lay in some places thick enough to be measured, in others they show themselves only by a mere thin line, just as they were blown about hither and thither by the passing breeze. They are the ashes of shrub and plant burning for the extraction of the alkali, just as is practised by the Bedouin at the present day.

But a period of revival took place. This is attested by the existence of a rectangular building, which probably belongs to the period of the second wall, although it stands above it



ALABASTER

Aegean Pottery 1600 B.C.

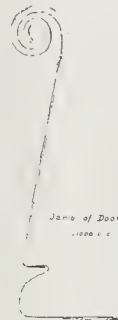


Phoenician Pottery. 1000 B.C.?



Sketches of Pottery and other objects from Mr. Flinders Petrie's Exhibition.

in level. Its walls are still about 8 ft. high, completely buried in the accumulated earth of the Tel. But this building itself bears evidences of reconstruction. Old material is found in it re-used. There is a curious scratched figure of an animal on a small slab of limestone. It has been taken from elsewhere, and is turned upside down. Several doorways have been traced, and several of the jambs of these are formed of limestone slabs, on which are worked curious spiral twists, one of which is sketched.

Jamb of Door  
1000 B.C.

These form the right-hand sides of the jambs, and mark the thickness of the walls. The left-hand sides are plain, having been covered presumably by the doors themselves when opened against them. Immediately above these ruined walls are others of a larger and more important building, which belong probably to the period

of the third wall. They are still about 14 ft. in height, and are, like the others, constructed of sun-dried bricks, and are adorned with a series of projecting pilasters at irregular intervals, but some of these are probably return walls. From the topmost level, doubtless, to that of the stream exists a well for the use of the garrison. It is placed in the tower-like building.

Such, in brief, are the results of the excavations, and for the first time we know the formation of the mound; and if this example may be taken as a specimen of others, as is probably the case, we are in possession of interesting information likely to be of more general application.

But valuable data are at hand to determine with a certain amount of exactitude the actual periods when the mound was peopled. This is by comparison of the pottery found at various levels, the precaution having been taken to mark all the specimens as they were met with. They are found to vary in style and in texture in the various strata dug through.

At the lowest level the pottery was blackish-brown in colour, fairly smooth and thin in texture, tooled over in some cases before firing to bring the surface to more even surface. It has not hitherto been observed, or certainly not in relation to what was found above it. We illustrate two examples. In no case was this found higher than the level of the first wall. This is succeeded by an entirely different class, but well known to observers as being of Phoenician manufacture.

We give several examples. Similar pottery has been found at Rhodes, by Major di Cesnola in Cyprus, by Mr. Petrie in several sites in Egypt, and, in fact, more or less in every ancient site along the Mediterranean. Its existence in so many places attests the commercial enter-





resemblance, as if the forms of the older pottery had been copied by later manufacturers, the workmanship not being so accurate. We illustrate several examples of this fluted ware which are new to observers, and, like the older class, its period seems to be incontestably proved by its position. It may readily be considered as of later date than the Phoenician examples found beneath it.

We have thus, in this interesting mound, distinct traces of at least three active periods of building work, and regarding these in the light of the recorded history there is remarkable agreement. We may assign the lowest wall and its pottery to the time of the Amorites, whose cities, we know, were "great, fenced up to heaven." The period of decay, after the destruction of the city, or of use only by roving herdsmen, is eloquently pointed to by the traces of their bush burnings. The second wall appears to be that erected by Rehoboam, during which time, and later, the Phoenician pottery was used, followed by a re-erection of the walls and the use of the third class of pottery up to a later Jewish time. The upper walls may be, therefore, and most probably are, those of the fortress taken by Sennacherib. Traces of reconstruction and repair are observable in all the walls. A few fragments of painted Greek pottery, about 500 to 330 B.C., and some of Roman times, indicate that the site continued to be occupied until after the Christian era, probably to no great extent.

Be this the site of Lachish or not, it must be borne in mind that what occurred to the former city, ensued equally to at least the most important of its neighbours. All were alike taken by the children of Israel. Rehoboam constructed several strong places in its immediate vicinity, and Sennacherib would doubtless have overcome all the places of strength in the locality of Lachish.

The consideration of these momentous events, connected so intimately as they are with the land and the history of the Chosen People, points in a very practical manner to what should be done further to elucidate them. If a few excavations, skilfully performed, but which have not caused a very great amount of the site to be turned over, have produced such interesting results, what may not be expected from more extensive ones? Surely these discoveries point to what should be the future of Palestine exploration. The pick and the spade will bring to light what is safely hidden until the time comes. Almost every ancient site, it may be presumed, contains town upon town, one built above the other, with all the varying works of each period still remaining. We have already referred to the Eastern practice, and this, in the light of what has been proved at Tel-el-Hesi, should be sufficient to stimulate many an explorer to enter upon this new field of enterprise. The Society which encouraged Mr. Petrie to enter upon his work has many a claim by its years of good service already accomplished, and it may be congratulated upon at last entering upon a new departure. We urge it strongly to continue this work, which has been too long delayed, and to consider that the exploration of the future must be that which the excavator alone can accomplish.

There is a rich harvest to be reaped in these buried mounds, untold as they are in number, throughout the length and breadth of the Holy Land, and the public will wait with impatience for further indications of the treasures of the past which they contain.

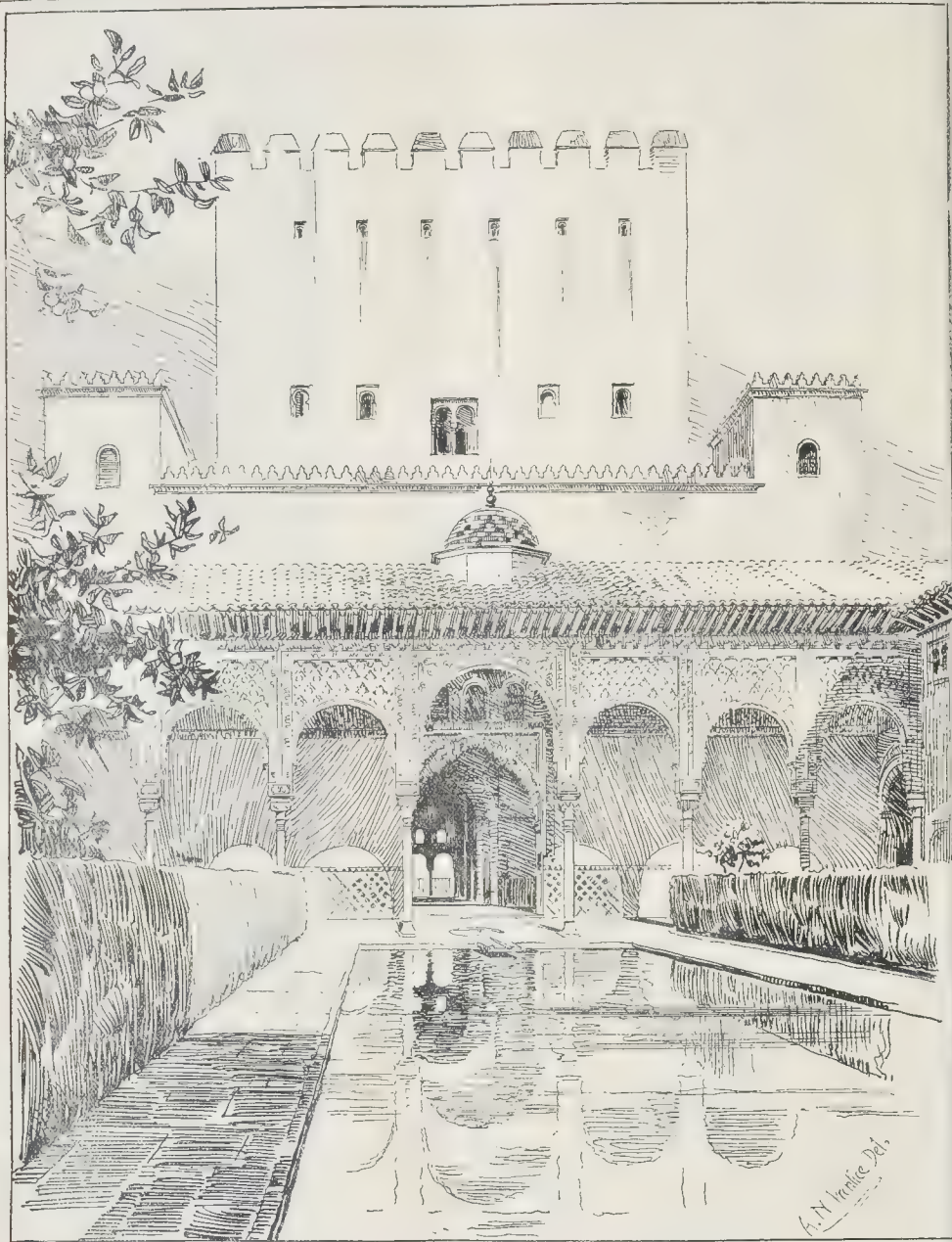
The map which the Palestine Exploration Fund has published is an important addition to human knowledge, since by its aid we can see at a glance the surroundings of every site. But it only raises our anxiety to know the histories of the many important and unknown sites which are shown upon its sheets in such remarkable profusion.

**MOULDING AND PLANING MACHINE.**—Messrs. J. Sagar & Co., of Halifax, have just brought out a new pattern moulding and planing machine, which should prove useful to those who require a single machine for general purposes. The machine, in addition to moulding and planing, can be used for tonguing and grooving, both in hard wood and soft. It will cut on all four sides of the work at one time, having top and bottom and also side cutter blocks; the latter being after the top cutter. The bottom rollers adjust vertically, and the bottom cutter block works in a carriage, so that the cutters may be easily withdrawn for sharpening. The table in front of the bottom cutters will adjust vertically to vary the thickness of cut, the space being opened and closed as required. The frame is composed of a single casting, and phosphor bronze is used for bearings.

prise of the remarkable but little known people who produced it. The lowest example found in the mound was at a level of 305 ft. above the Mediterranean, the highest 325 ft., extending thus above the level of the third wall. The date of this pottery can be ascertained with fair certainty from Mr. Petrie's former Egyptian discoveries, where it is known by other articles, the dates of which have been ascertained by

their hieroglyphics, &c., not to be older than about 1,000 B.C. This is important in relation to the history of the mound, since it gives the age of its central portion, leaving us readily to conclude that the articles found at the lower level are earlier, and the upper ones later. The upper ones consist of a different class so far as regards texture of material, and to some extent of form, although there is a certain

Sketches of Pottery and other objects from Mr. Flinders Petrie's Exhibition.



View in the Patio Alberca of the Alhambra, Granada: looking towards the Sala de la Barca and the Hall of the Ambassadors.

#### THE ALHAMBRA, GRANADA.

LAST week we gave a short notice concerning the recent unfortunate fire at the Alhambra. To-day we supplement it with a sketch of the interior of the Court of the Alberca, otherwise called the Court of the Myrtles, looking towards the Hall of the Ambassadors, which rises in the background. The view is taken from the south end of the Court, and shows the colonnade and entrance to the Sala de la Barca, which is a long, narrow hall about 70 ft. by 15 ft., and occupies the space between the two small pavilion towers (see sketch). The Torre de

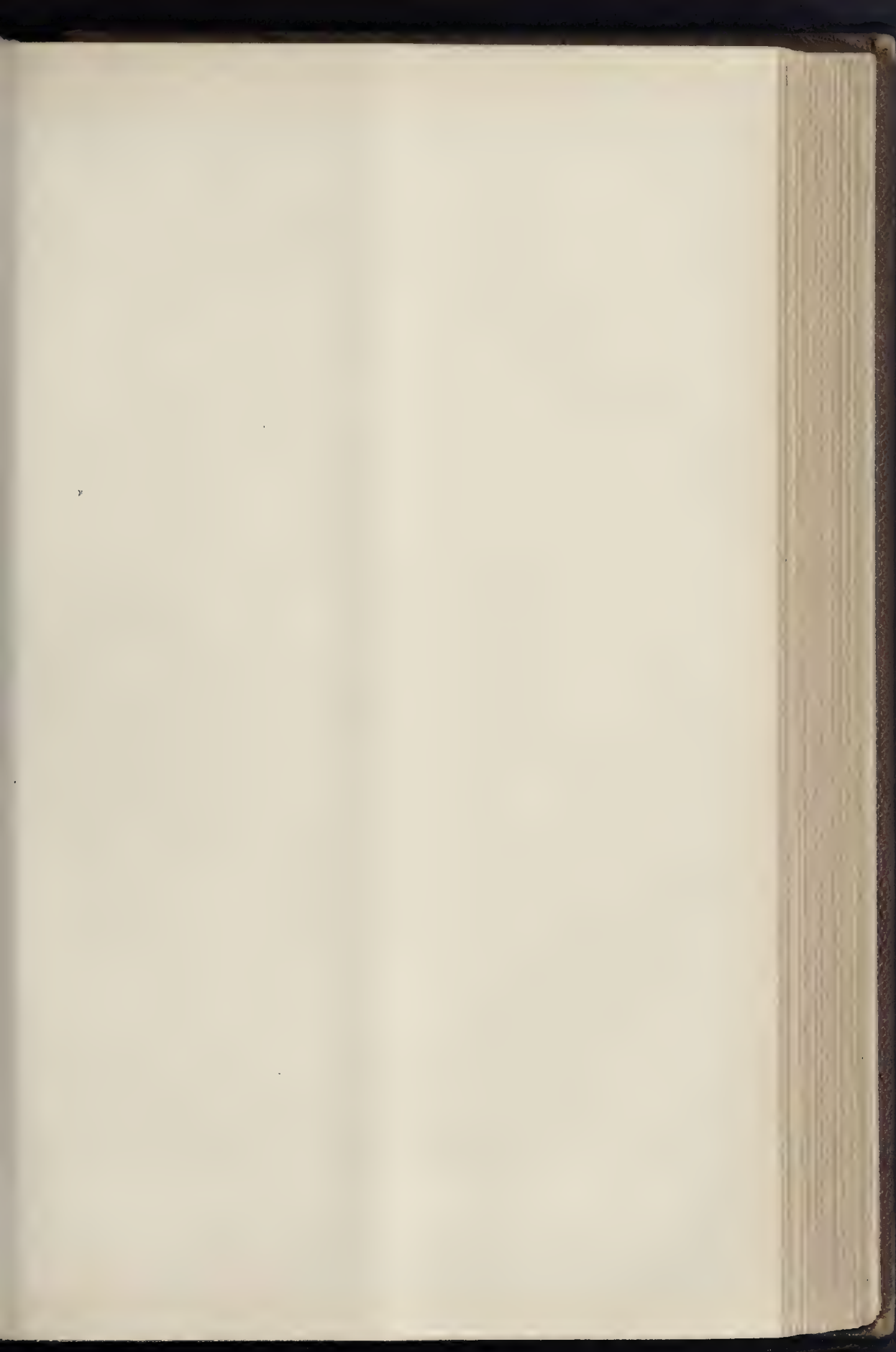
Comares rises immediately behind and contains the Hall of the Ambassadors, 37 ft. square and 75 ft. high, so that the Sala de la Barca really forms an ante-hall to the great hall beyond. The pillars and capitals of the colonnade are of white transparent marble, the upper portion being of very fine stucco work with a surface like ivory. The general tone is a pinky-cream colour. The original colours are only to be found in parts protected from the weather and high up on the ceilings of the halls. Unfortunately the roof of the Sala de la Barca was one of the best-preserved examples of this kind of work, and was in the shape of a boat turned upside down, hence the name Barca (boat).

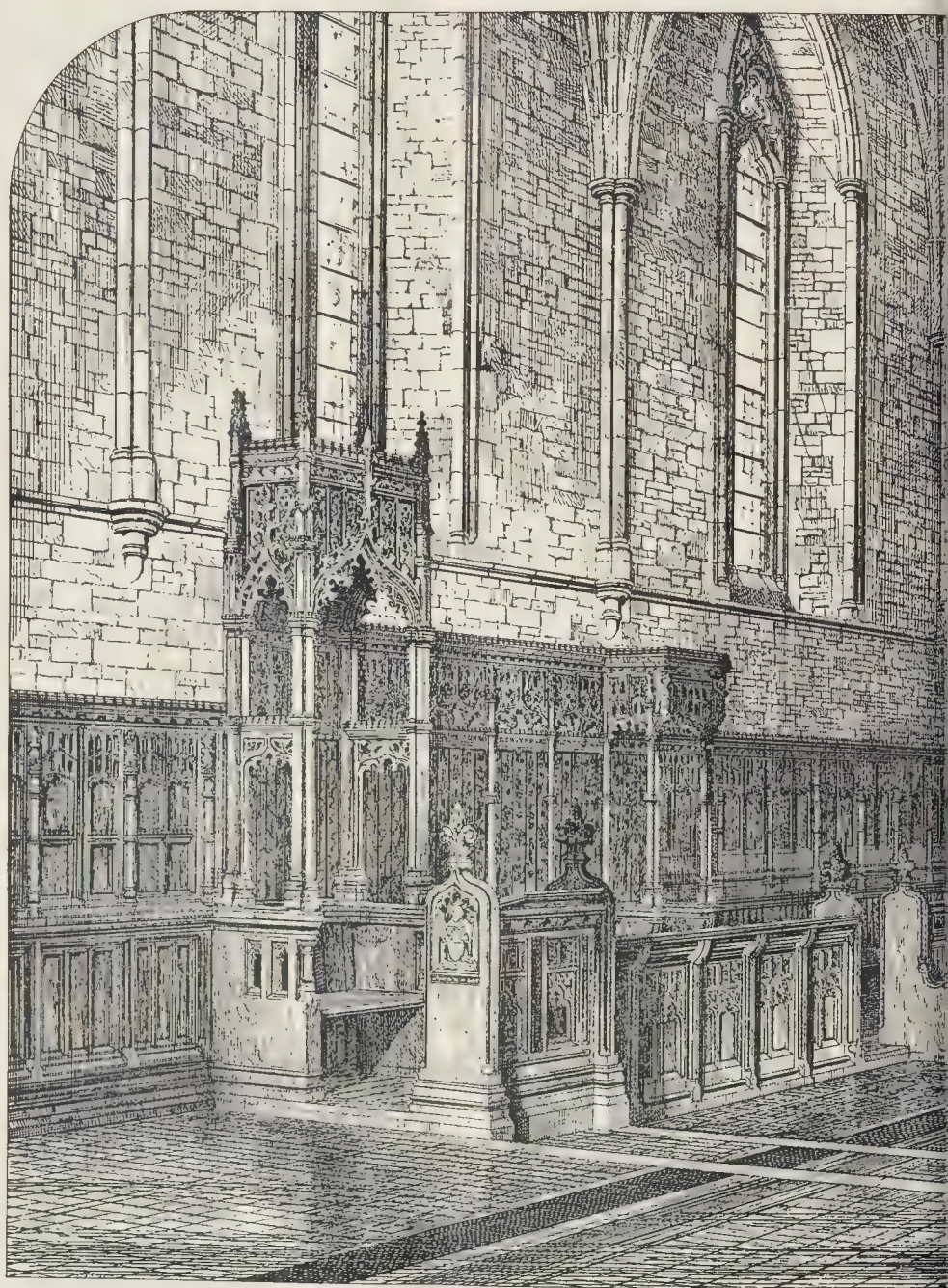
The courtyard is paved with white marble and the halls with Moorish tiles. The famous Court of the Lions is situated to the right of the sketch. (See sketch-plan on opposite page). We give a detail of one of the columns from the Alberca Court, and also a small sketch-plan, in which the portions burnt are shown black.

The following extract from a letter written on the 18th inst. by Mr. Henry Stanier, the British Vice-Consul at Granada, which appeared in the *Times* of the 23rd inst., may be taken as giving an authentic account of the extent of the damage done:—

"It appears that the fire was discovered about half-past 10 o'clock on the night of Monday, the







ARMAGH CATHEDRAL · INTERIOR, SHEWING REF.

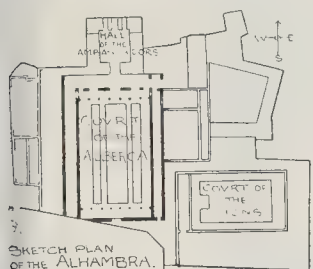




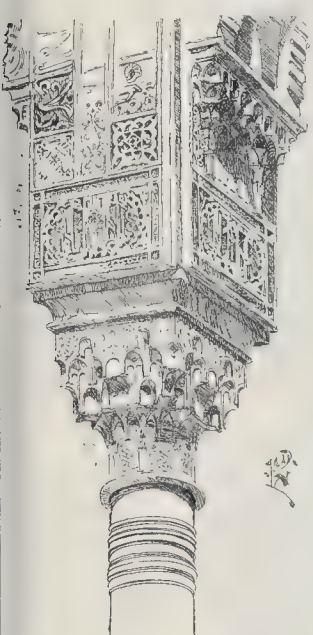




15th inst., but, being asleep in bed, I did not hear the alarm of fire until nearly twelve o'clock. When I entered the palace the fire was raging furiously, and it seemed the whole of the palace was doomed. It appeared to be on fire in three distinct places, which made one feel certain that



some criminal hand had been the cause of it. By some judicious cutting in the roofs the fire was prevented from extending to the Court of Lions and the Hall of Ambassadors, and was confined to the Court of the Alhambra, and this court, having a large tank of water in the centre, enabled



Capital in Court of the Alhambra, Alhambra.

the fire-engine to have an abundant supply, and everybody who could helped with a will, and by two o'clock the fire was localised to the Court of the Alhambra and the Sala de la Barca. The roof of this hall has been entirely burnt, but its walls are intact, although calcined, and the beautiful colouring is preserved. The gallery at one end of the Court of the Alhambra has also had its roof entirely destroyed. This and some rooms extending all on one side of this court form the total of the parts burnt. The Court of the Lions and all the other courts and halls are intact, and have not suffered in the slightest degree. The opinion is that the fire was intentional, but nothing has been found out, and all is a mystery. Inquiries are being made, but I expect it will never be discovered who did it. It is a miracle how anything escaped, for the fire was most intense, but the immense thickness of the walls of the Tower of Comares prevented the fire extending to the Court of Ambassadors, and the cutting away of the roof prevented its extending to the Court of Lions. When I left at four o'clock the fire was almost out, merely smouldering a little here and there. I, as well as many others, helped by carrying buckets of water and doing all we could to assist in keeping down the fire. Nothing was heard but lamentations and imprecations on the dastardly villain who had caused its cause. Granada and the entire world have

to be thankful that one of the most beautiful and wondrous works of art ever made by man is still in existence, and that what has been burnt can all be restored, except the ceiling of the Sala de la Barca and the beautiful colouring on its walls. Men are at work now, day and night, clearing away the rubbish, and the damage will soon be put to rights."

### ARCHITECTURAL ASSOCIATION VACATION VISITS: HAM HOUSE.

THE seventh and last vacation visit of the year took place on Saturday last, when a large party of members of the Architectural Association visited this extremely interesting seventeenth-century house. By the kindness of Lord Dysart and Lady Huntingtower, who met the party, the visitors were shown over the whole of the house, without restriction, and thus enjoying to the full the many treasures to be found, they felt, one and all, that the last vacation visit was most certainly the best of the year.

Ham House was erected, in 1610, by Sir Thomas Vavasor, and from the fact that he was Marshal of the Household to James I. has probably arisen the tradition recorded by Lysons and Neale that it was intended for the residence of Henry, Prince of Wales; a tradition, however, which appears to lack sufficient foundation, as the Prince does not seem to have resided there, and Sir Thomas certainly did so until he transferred the property to John Ramsay, Earl of Holderness, by whom, or by his heirs, it was sold to William Murray, who was created first Earl of Dysart by Charles I. The first Earl left five daughters but no male issue, and the property thus by marriage came into the possession of the Tollemaches, William Murray's eldest daughter having married Sir Lionel Tollemache, from whom the present Earl and possessor is descended.

Ham House is delightfully situated near the banks of the Thames, and is especially noted for its fine avenues of elms, one of which, Ham Walk, presented itself to the view of some of the visitors, who, however, were unable to pass along it to the house, as the gates have been closed for centuries, and they were, therefore, obliged to take a more circuitous route, after admiring the wrought iron work, erected in the reign of Charles II., by the Duke of Lauderdale, whose arms: quarterly, first and fourth, a fret for Tollemache, second and third, an imperial crown between three mullets, within a double tressure, flory counter flory for Murray, surmount the gates.

The house was considerably enlarged in the time of Charles II., the garden front having been then erected by the Duke of Lauderdale, by whom the house was sumptuously furnished, and in whose time Ham was the centre of political activity, the notorious Cabal Ministry in particular meeting there in what is still known as the Cabal room.

Ham House is rich not only in Carolean furniture but also in remarkably fine examples of the work of Vandeyck, Sir Peter Lely, Sir Godfrey Kneller, and Sir Joshua Reynolds, among which may be especially mentioned the portraits of James Stuart, Duke of Richmond and Lennox, by Vandeyck, of Lady Huntingtower, by Sir Godfrey Kneller, of Charlotte, Countess of Lionel, Fourth Earl of Dysart, by Sir Joshua Reynolds, and of Jane Savage, the first wife of the fifth Marquis of Winchester, who so gallantly defended Basing House against the Parliament on behalf of Charles I. Milton composed the epitaph of the Marchioness, which runs thus:—

"This rich marble doth enter  
The honour'd Wife of Winchester;  
Summers three times eight save one  
She had told; alas! too soon,  
After so short time of health,  
To house with darkness, and with death:  
Yet had the number of her days  
Been as complete as was her praise,  
Nature and Fate had had no strife  
In giving limit to her life."

Other famous and remarkable pictures are found in the great gallery, 92 ft. long, amongst them the portrait of Sir Lionel Tollemache, second Earl of Dysart, by Vandeyck, and a portrait of Charles II., specially painted for the Earl of Dysart by Sir Peter Lely.

In addition to the pictures and furniture are some good specimens of tapestry, some of which were possibly worked at Mordlake, where Sir Francis Crane established a factory. That in

the Cabal Chamber, designed by Watteau, well illustrates the feature of fashionable life known as a *fête champêtre*. The elaborate inlaid floor, with the cypher of the Countess Elizabeth, is also worthy of notice in this and the adjoining room.

The restoration of the silk hangings in the miniature-room deprived the visitors of the pleasure of seeing the famous collection which has its place on the walls of this apartment, but the elaborate ceiling and cove, painted—as were several others in the house—by Verrio, were fortunately in evidence.

Other features of the house that should be remembered were the central hall, with its open gallery on the first floor; and the remarkably handsome principal staircase, carved in walnut wood to represent warlike trophies.

An especial favour was granted to the visitors by the opportunity of inspecting the famous library, so rich in priceless Caxtons and Court Rolls of the seventeenth century.

Mention should be made of the decoration of the river front, the older portion of the house, by the curious series of busts, cast in lead, although painted stone colour, and ensconced in niches on the wall face.

After revelling among the numerous relics of the historic past, an equally vivid though entirely different interest was experienced by the inspection of the laundry, the first example, we believe, of electrically-driven machinery applied to this purpose in England. The engine and dynamo, supplying the motive-power for this establishment, also furnish the electric lighting for the house.

A glance at the stables and cow-houses completed a most pleasant and enjoyable afternoon in one of the most famous and interesting old mansions in the neighbourhood of London.

### Illustrations.

#### ARMAGH CATHEDRAL.

THE drawing shows the re-arrangement and refitting of the choir with new stallwork, together with the opening-out of the nave for the use of the congregation. These works have now been completed, but since the drawing was prepared canopies and other additions are being made to the chapter-stalls and throne.

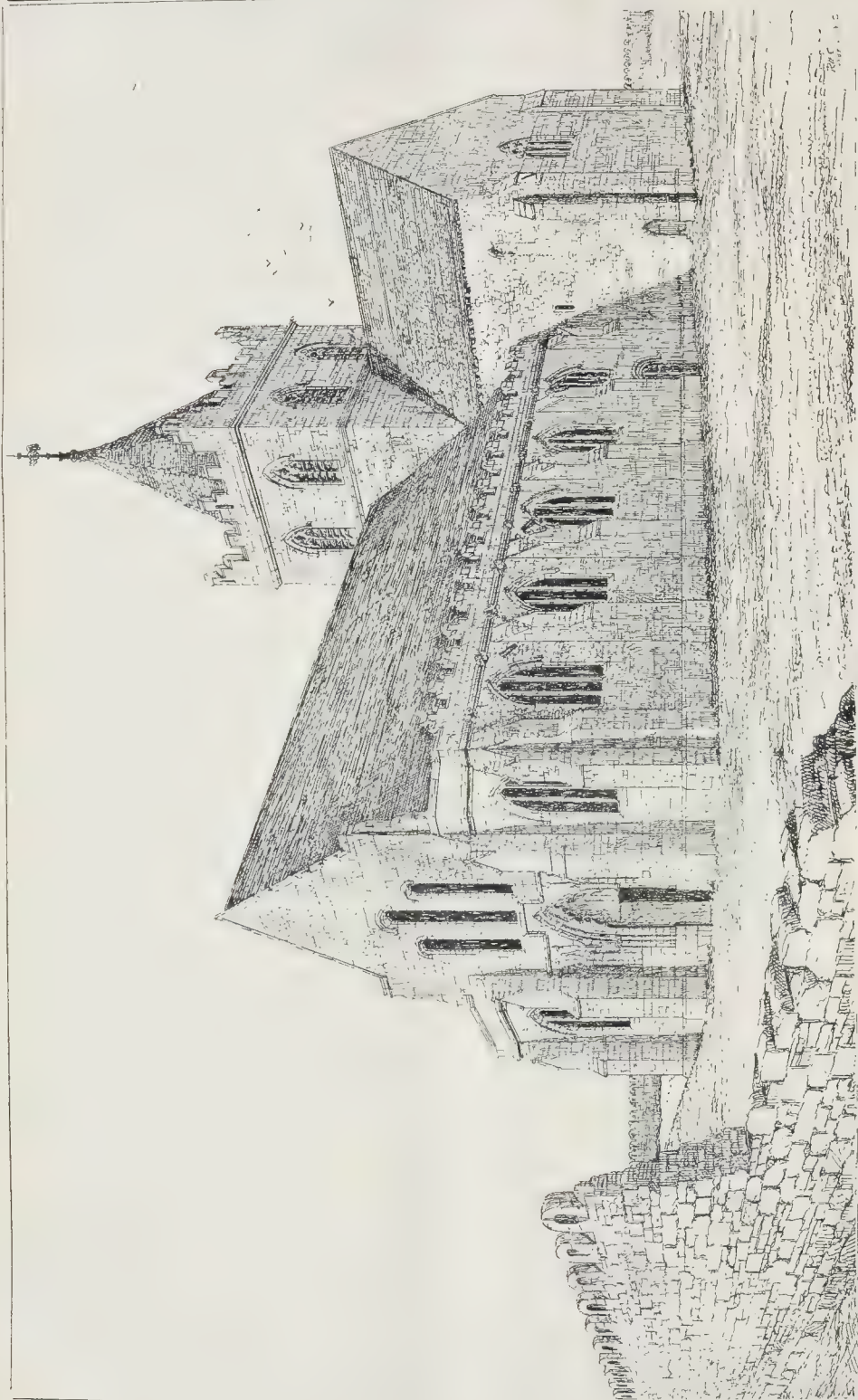
Certain structural works have also been carried out, such as a new roof to the south transept, and the careful repair and strengthening of that of the choir, and others yet remain to be done, as the existing roofs of the nave and north transept are but plaster imitations of massive woodwork, and the arcades and walls are thickly encrusted with "compo" and rotten lath and plaster.

Before these alterations, carried out under Mr. R. Herbert Carpenter and Mr. B. Ingelow, the choir and one bay of the nave and the area of the towers were alone used for services, the alterations of 1834, under Cottingham, having been an attempt to squeeze both choir and congregation into this wholly inadequate space, following the precedent then usual in the case of much larger English cathedrals, and cutting off the nave by a solid stone screen, and using it but as a vestibule to the choir.

The history of the Cathedral, though deeply interesting and intimately associated as it is with the religious and civil life of Ireland, is so voluminous that it can only be touched on so far as it relates to some of the changes and alterations in the structure in both ancient and modern times. Founded by St. Patrick, and known in Celtic times as the "Damhliag Mor" or "great stone church," the Cathedral of Armagh, though much altered and modernised by Cottingham in 1834, yet retains in some of its details and in its general plan the design of its mediæval rebuilders.

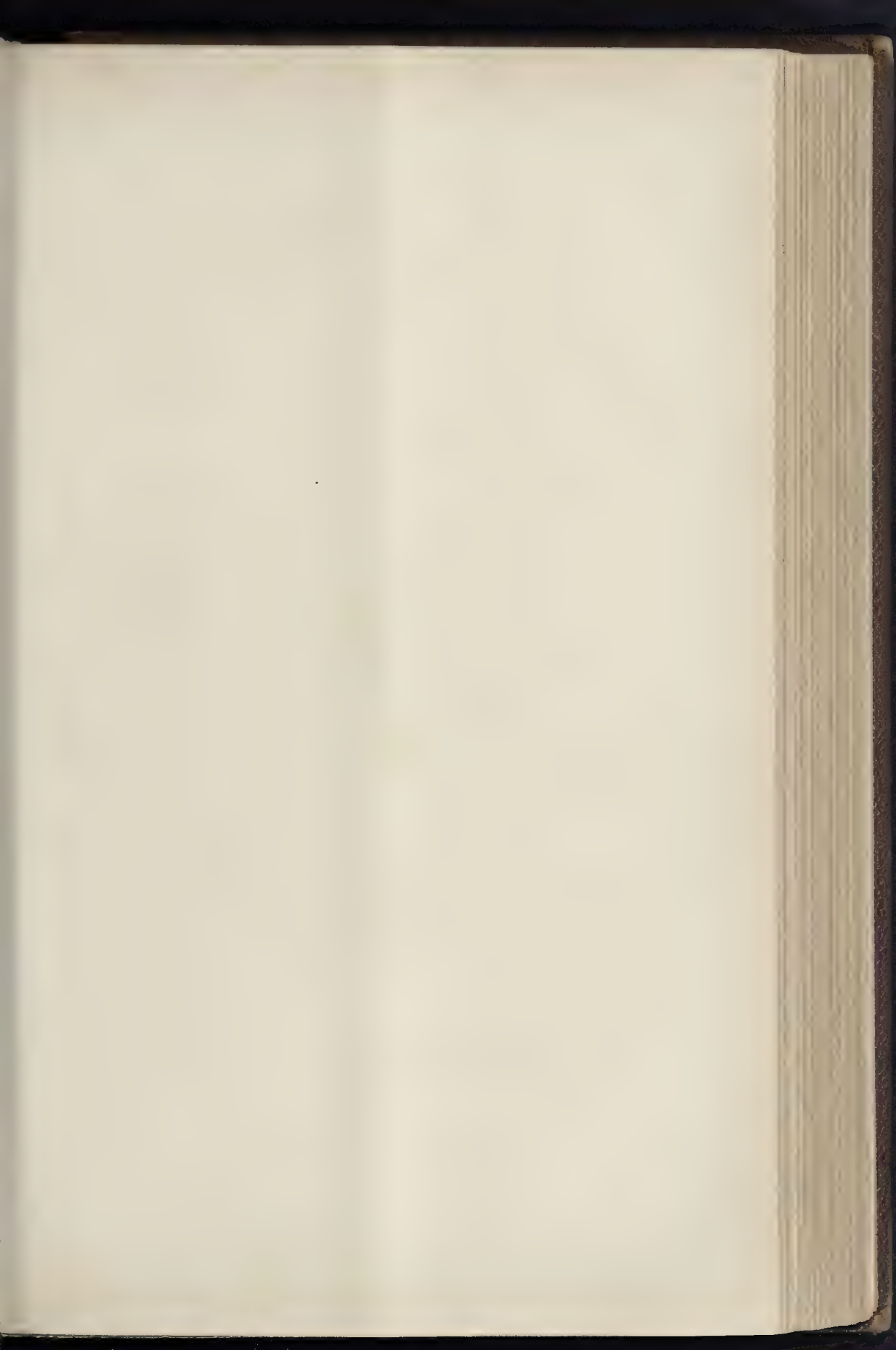
From Cottingham's measurements and drawings (fortunately preserved) we learn that there then existed much of the work of Primate O'Scanlain (1261) and of Primate Sweteman (1365), modified and altered by the repairs and partial rebuildings of the fifteenth, sixteenth, and succeeding centuries; while on the church itself and around it were the fortifications carried out by the orders of the Earl of Sussex to resist the attack of Shane O'Neill—in effectual, however, as the church was captured and burned by the rebels.

Cottingham's first sketch designs, prepared for Primate Lord J. G. Beresford, show that he was anxious to carry out a "conservative resto-



Armagh Cathedral: View Showing the Cathedral and Fortified Wall before Cottingham's Restoration.  
Compiled from Cottingham's drawings and other sources by Mr. R. H. Carpenter.







HATCHFORD, SURREY. VIEW OF GARDEN FRONT.

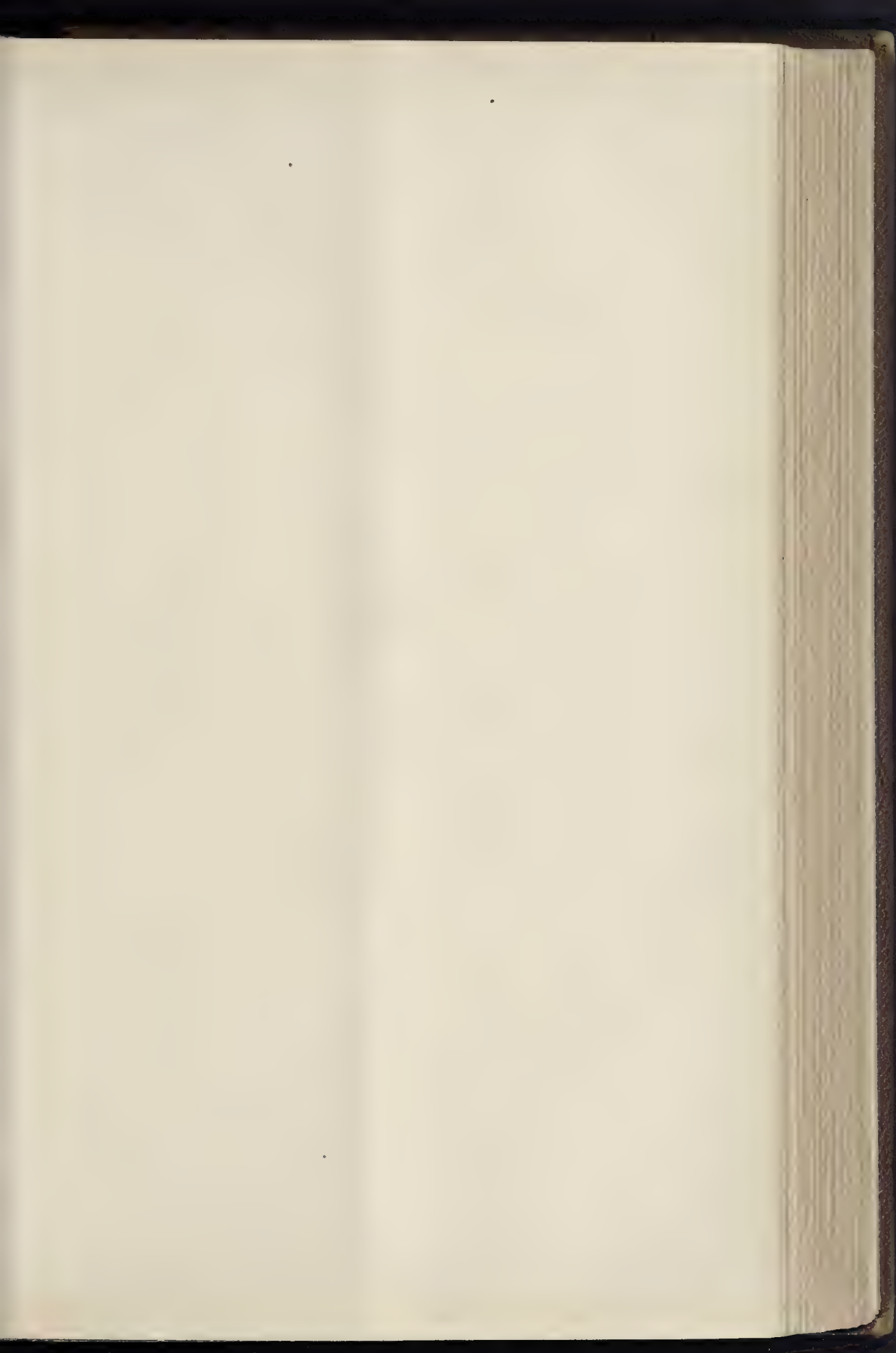




LDING.—MR. ROWLAND PLUMBE, F.R.I.B.A., ARCHITECT.







THE RUINER SEPTEMBER 27 1840







PHOTOGRAPH BY MR. J. H. B. GARDNER, LONDON

CAVENDISH COLLEGE, CAMBRIDGE.—MESSRS. GILES, GOUGH, & TROLLOPE, ARCHITECTS.

Academy Exhibition, 1890.









HATFIELD, SURREY. VIEW OF ENTRANCE FRONT.

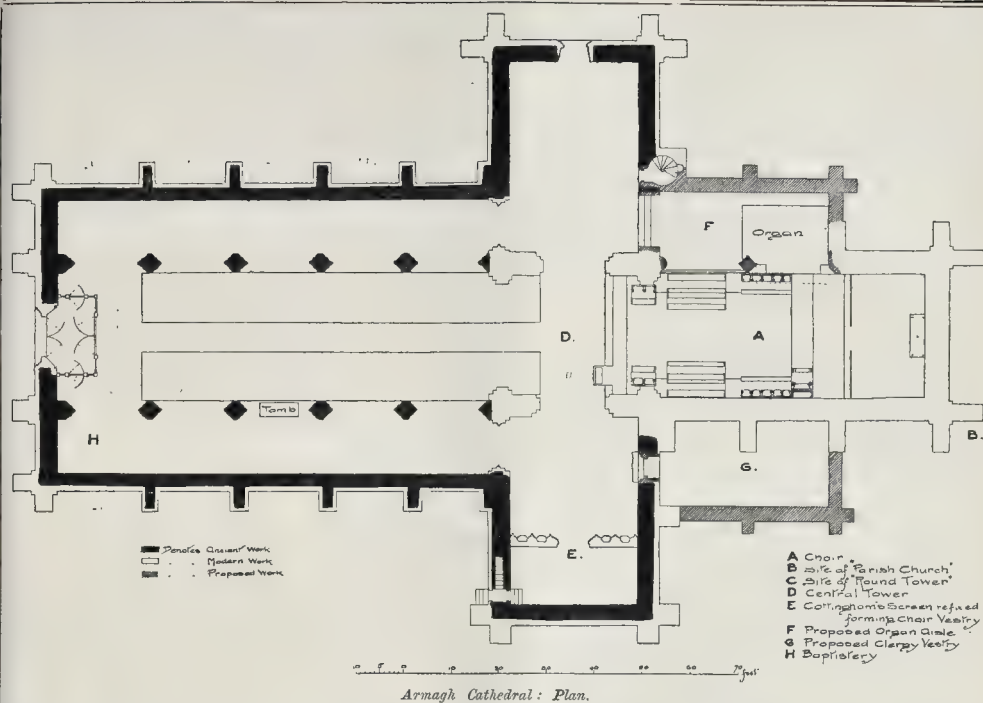




DING.—MR ROWLAND PLUMBE, F.R.I.B.A., ARCHITECT







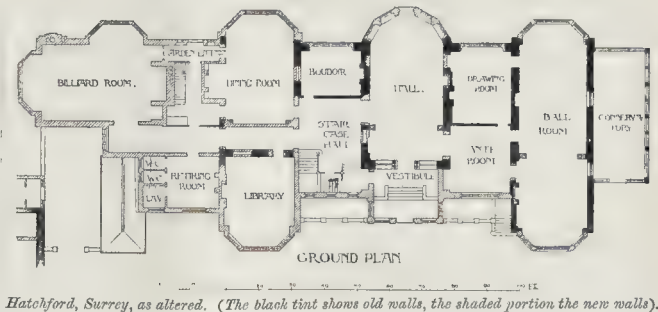
ration," but, unfortunately, he either changed his mind or was overruled, and the whole of the exterior and much of the interior shows by its modern design how little the spirit of Gothic architecture was then understood, even by so accomplished an architect.

In 1802 the altar had been placed at the west end, the choir disused, and, together with the transept cut off from the nave. Cottingham's task was, therefore, to bring into use again as much as possible of the ancient area of the church. He rebuilt the choir on designs of his own, together with the tower arches, and he reinstated the dilapidated nave, or rather a portion only of it, replaced the whole of the exterior, and refitted the interior.

The choir has now been brought back to its original use, but is adapted to the now reduced number of the Chapter, for whom five stalls on either side are provided. Seats westwards of them accommodate the choir men and boys, while under the eastern arch of the tower are stalls for the vicars choral. The new archiepiscopal throne, a memorial by some of his friends to the late Mr. Beresford Hope, and a gift to the Primate, stands in its proper relative position.

At present the organ, originally erected by Cottingham at the southern end of the south transept, stands in the northern one, immediately under and beyond the lower arch, thus interfering with the proper performance of the services, and rendering the choir almost inaudible; but it is intended, as soon as possible, to remove it to a position, eastward of the singers, in an aisle opening into the choir. A cruciform church, with large central piers, must always be a difficult problem to solve as to the acoustics, and this arrangement is felt to be, on the whole, the best to meet the case.

The throne and stall work have been carried out by Mr. Bowater, of Shrewsbury, aided by Messrs. Collen, of Belfast, the general contractors. The latter firm have reconstructed and adapted Cottingham's oak stalls and seats for the use of the congregation, and have erected the new roof to the transept, and executed the various structural works. The brass and wrought iron gas-fittings are by Messrs. Singer and by Mr. Gawthorpe; the tiles by Messrs. Minton; and the heating by Messrs. Musgrave & Co. Mr. F. E. Smith superintended the completion of the work, after the resignation of the first clerk of works appointed. The drawing of the remodelled in-



terior, from which the principal illustration is taken, was exhibited at the Royal Academy this year. We give also a reproduction of a drawing by Mr. Carpenter, compiled from Cottingham's drawings and other sources, showing the exterior of the cathedral previous to Cottingham's "restoration."

#### HATCHFORD PARK, NEAR COBBHAM, SURREY.

This house was probably built late in the last century. The principal rooms were to the west, a kitchen wing, with nurseries over, to the east, and beyond the latter were situated the stables. The late owner, some years back, altered the outbuildings, and built a bowling-alley and billiard-room at the back of the stables, but as these were on the basement-floor and approached through the nursery wing, down a staircase and along passages, about 200 ft. away from the dining-room, the present owner decided, on the advice of his architect, to pull down the nursery wing and large range of outbuildings, together with the billiard-room, &c., and to convert the old west wing into a more conveniently-arranged modern residence, re-arranging the whole, and building the billiard-room with retiring-rooms, &c., on the same floor, and immediately adjoining the new dining-room. The old west wing of the house had small entrance and staircase halls, with dining-room behind the former; narrow pas-

sages led to the boudoir, library, drawing and ball rooms on either side. The old dining-room has been turned into a spacious hall, two floors high, with gallery all round same. Stone mullioned bay-windows have been built to the various rooms, and the narrow passages have been built out into spacious ante-rooms and staircase-halls, all as shown on the plan. The first-floor has been heightened throughout and a new second-floor rebuilt and arranged in the wide span main roof with gables running into the latter. The old house had a plain painted stucco front of low elevation, with a parapet concealing the roof all round. Additions have been arranged so that the old house is mostly concealed by the new building, but where it does come to the front it is encased with red brickwork on the outside, on basement and ground-floors, and is tile-hung on first-floor. The roof and gables forming the second-floor are entirely new, and show oak half timbered work and barge boards to gables, and Broseley tile-roofs. The stables adjacent to the house are being altered and added to in character with the house. Messrs. Laing, Wharton, & Down are fitting up the whole of the premises with electric light. Mr. J. Boulting is executing the hot-water heating and sanitary work throughout, and Messrs. Forster & Dicksee, of London and Rugby, are the contractors. The whole is being executed from the designs and under the superintendence of Mr. Rowland Plumble, architect.

## BABLAGE BOYS' SCHOOL, COVENTRY.

These Schools, recently completed, afford accommodation for three hundred boys, a hotel for forty boarders, and a head-master's house.

On the ground-floor is the principal entrance in the centre of the south front, leading to hall and staircase; right and left runs a corridor leading to the class-rooms; on the left an under-masters' common room, and the boys' dining-hall, 55 ft. by 23 ft., capable of dining one hundred boys, with sewing-room, pantry, &c., adjoining, attached to the kitchen.

From the entrance-hall the great hall is entered. This hall is 85 ft. by 38 ft., lighted on both sides and end. Beyond this, and approached by corridors on either side, are the workshops, laboratory, and boys' cloak-room and lavatories,—the two latter entered from the playground.

On the upper floor are the boys' dormitories and masters' rooms, &c., approached by a wide stone staircase leading from entrance-hall.

The whole of the buildings are of red brick, with stone dressings, and were carried out by the contractors, Messrs. Thomas & Sons, of Burton-on-Trent, from the designs, and under the superintendence, of Messrs. Giles, Gough, & Trollope, architects, of London.

## CAVENDISH COLLEGE, CAMBRIDGE.

This centre portion consists of entrance hall and porter's lodge, communicating with the several blocks by a colonnade of open-pointed arches, with a court to the left, bounded on the other side by the hall. At the end of this, and at right angles to it, runs a passage into which opens, on the left, the hall, on the right, the kitchens, &c. The hall, 81 ft. by 43 ft., is of red brick, interior and exterior. The floor is of wood blocks with a dais at the south end, and the walls to a height of 6 ft. are panelled with American walnut. The roof is an open one, and of pitch-pine, with an open fêche. At the north end, and of the whole width of the hall, is a gallery. Opening out of the hall is the combination-room, which again opens into a court corresponding on the other side to the court on the left of the entrance colonnade. At the rear are the kitchen, buttery, larders, scullery and store-rooms, and servants' hall. The hall will seat 250. The buildings are of red brick with stone dressings, corresponding to the older existing portions, and were, together with the aforesaid older portions, designed and superintended by Messrs. Giles, Gough, & Trollope. The contractors were Messrs. Claridge & Bloxam, of Banbury.

## ARCHITECTURAL COMPETITIONS IN GERMANY.

IN the course of the year we have several times referred to the results of the more important of the architectural competitions held in the German Empire, and as we now have some statistics compiled by Professor Stier (Hanover) for his paper on "Results of the German Competitions of the last Twenty-two Years" read at the recent Congress of Architects and Engineers at Hanover, it may be of interest to give an extract from the somewhat formidable rows of figures contained therein.

According to the learned Professor (who, by the way, intends at a date not far hence to publish a volume on the subject) the number of competitions held in Germany since 1868 (the year of the first five opened in that country) is 258; and for these 258 competitions no less than 11,256 designs have been submitted, showing hence an average of forty-four designs, a number which in some cases is, however, far exceeded; as, for instance, the Houses of Parliament work of 1882 alone attracted 182 candidates. In the 258 competitions, 751 awards (with a total value of 930,000 marks) have been given away, and of these awards one "first prize" has fallen to every forty-nine designs. In 216 out of the 258 cases the final result of the competition has been ascertained, but only in 109 instances has the "First Prizeman" had the erection of the edifice; whilst in thirty-one cases the erection fell to the second or third prizeman. In thirty-one other cases the erection has taken place according to the designs, but not under the superintendence, of a successful candidate; and in forty-three cases no building resulted from the competition. Altogether 171 buildings have been erected for 214 competitions with 9,981 designs, or, in

plainer words, our German friends have been working at their competition designs with a 1½ per cent. chance of an erection,—a percentage far below all reason.

We see how many candidates have, according to Professor Stier's interesting statistics, spent their valuable time on the competitions of the last twenty-two years, and what a small percentage have obtained the much-desired erection according to their ideas; yet if one sifts the matter, the state of these competitive affairs abroad has not been as bad as it looks. Any one who may have visited an exhibition of competition designs in Germany will have noticed the large amount of work absolutely unfit for a place on the walls,—work which has been sent in by young and inexperienced members of the profession, students who, although at the same time not adverse to the possibility of gaining a prize, take advantage of the competition for their own instruction, thereby learning to adapt themselves to fixed requirements; and if we were to subtract the number of these designs from the number of competitive designs proper, the figures throughout would certainly have a far more favourable aspect.

We must take into consideration also that the German competitions, as a rule, are exceedingly well managed, and that this fact certainly encourages candidates to try their strength and hence greatly influences the statistics. When in 1868 the system of having competitions was fairly started, the deputies of the amalgamated architectural societies at once saw that the mode in which these competitions were to be held must be regulated to some extent, and hence we find that at their meeting of the same year, and later again in 1879 and 1883, resolutions were passed and some paragraphs of advice published for the benefit of authorities or private people likely some day to indulge members of the profession in the privilege of competing for the designs of their buildings. On the whole, the advice given in these paragraphs has been followed, and whatever may have been the special faults noticeable at some of the competitions, the candidates but seldom had reason to complain of unfairness in the management. The "appointed assessor" is an unknown personage in Germany; a jury takes his place, and in this jury the majority of members are architects, or, at least, competent judges of the artistic as well as of the practical sides of the question, whilst to the minority belong the laymen, such as mayor, schoolmaster, or museum director, just as the case may be. The possibility of a single person's prejudice against or in favour of a certain class of design playing a prominent part in the judgment is hence minimised; the personal opinion of the competent jurymen has the right of making itself heard, but it can be disputed; the vote of the majority decides, and, excepting in one or two stray cases, the decision has found approval both among the unsuccessful competitors and among the public in general. The names of the members of the jury are mostly given on the "competition programme," which has been compiled either under the superintendence, or at least with the sanction, of the jurymen, and hence the competitor not only knows who will judge his design, and can abstain from competing if he does not consider the judgment to be in competent hands, but he has also some guarantee that those who have opened the competition have had some competent advice, and are not likely to ask for what is unreasonable or impossible. The "programme" generally gives the candidate a clear insight into the requirements; it lays stress on the special idea preferable, mentions the material to be used, and often the style to be adopted, gives approximate measurements of the rooms, &c., required, and in most cases a good plan of the site. Only as to one point, *i.e.*, cost, do we continually hear of misunderstandings, as, excepting when very clearly marked, some of the competitors are liable to take the sum as approximate, whilst others take it as the boundary not to be exceeded; the promoters of the competition having been themselves sometimes rather uncertain in their minds as to what they really intended to spend.

As to the draughtsmanship of the designs, the scale (mostly 1/100 or 1/200) for the drawings is always mentioned, the mode of treatment left open; a mounting in a rather decorative fashion is customary. On the whole the competition work shows good line work, done in a sketchy form and touched up with shading in water-colours, mostly monochrome (seldom

hatched); the great thing apparently being to let both elevations and plans appear as "pretty pictures."

It would lead too far to go into the details of the statistics, or to mention all the rules and regulations occurring in the German competition system. The foregoing brief notes may give the reader some idea how these matters are managed in the Fatherland, up to the present time at all events; but in some classes of competitions the previous state of things is likely to be considerably changed under the present régime, when the Emperor has an eye for everything, and has gone so far as to appear at an architectural jury-sitting, and there to hold forth his ideas on the subject under discussion, and has even annulled the decision given by competent judges by opening a second competition on his own account; so that the competitions for monumental erections are now liable to become the prey of despotism; a change to be deprecated on every ground. If followed on the old lines, and if the larger competitions be left uninfluenced by "authorities," the system in Germany is likely to do some good to architecture in general, and is certainly popular, and as usually managed causes the least possible amount of dissatisfaction and petty vexations to unsuccessful candidates.

## Correspondence.

To the Editor of THE BUILDER.

## THE NEW CODE BUILDING REGULATIONS.

SIR,—Your remarks on the above-named touch very lightly on the subject. If the new "Rules to be observed in planning Public Elementary Schools" are in the main like former documents from the same source, they deserve much more energetic condemnation than you have meted out to them. The language employed is sometimes obscure, if it have not more academic defects. We are gravely informed, for instance, that the "accommodation of each room depends not merely on its area, but also on its shape"—of which Lord Burghley-like sentence the meaning appears to be simply that the accommodation allotted to depends upon dimensions of length and width suitable for the reception of the necessary furniture. The area is only a complication introduced by the department for the computation of claims for grants, and, although useful as a standard of comparison, the statement of it has only been available for the purpose of cramming the space. Again, in describing the details required by the department to be submitted to them, "at least four elevations" are stipulated for; one wonders how many the department would like to have, how many buildings have more than four sides? The rule that "No school-room lighted from one side only can be approved" is of one that apparently is made, upon the rules of the Government departments, only to be broken—for nearly all the successful plans lately published have class-rooms all along the length of one wall, and some have other class-rooms at the ends. Attempts to observe this rule are only attended by discomfiture, for plans restricted by it meet with no acceptance from boards, and the rules of the department. These are some of the points which decorate the first page (the bottom right-hand corner of which is very quaintly marked "over")—but I will not go beyond this, as the whole thing may be superseded by the last Code.

The Oldham School Board bought copies of these rules at threepence,\* and generously supplied them to intending or would-be competitors, most of them already in possession of the publication at half-a-crown. As the new Code has come out in the interval,—namely, that between the announcement of the competition and the date for sending in designs,—there is likely to be a curious complication.

F. B. P.

## AN "EMPLOYERS' UNION."

SIR,—I was glad to see the letter in the *Builder* of the current week under title "An Employers' Union."

The course proposed is, in my opinion, the only one that will efficiently check the existing state of affairs, brought about by the agitators in the name of trade unionism.

As an employer, both in the building trade and also brickmaking, I should be glad to help to form an Employers' Union, and to be a member of the same.

In my opinion every member should pay an amount based on the number of men employed, or wages paid; for we want the small as well as the large employer. But all these details must be carefully considered, and the thing must be done well if at all.

J. J.

\* We were guilty of an oversight in referring to these rules in our article as "new"; they have been drawn up and in circulation for some time back, but are now issued afresh as part of the New Code.—ED.



### "A SANITARY NOTE FROM GREENOCK."

STR.—The letter signed "X. Y." in the *Builder* of the 20th clearly shows that the writer does not properly understand the subject of house-drainage. His notion that the side fresh air inlet to a disconnecting trap, two yards from the trap, "would give that much greater volume of sewerage air to eject on to the street," is simply the height of absurdity. There is nothing in these two yards of piping to raise a smell. For fifty-five minutes out of every sixty, fresh air will be passing into the drain through them, and should this be stopped for a few seconds by the discharge of a closet, &c., the fresh air that has been entering, and filled the piping, has to be first pushed out at the grating before any badly-smelling air can get out.

By the time the badly-smelling air can get the length of the grating, the closet has ceased running, whereupon the bad air turns back the drain and goes up the soil-pipe and out above the roof. This is especially the case when the soil-pipe is inside of the house, as it is in thousands of cases in Glasgow, &c.

I do not remember of a single complaint of smell from a side grating put in as I have indicated.

"If in some particular case the discharge of a closet, &c., did cause a smell to come out of this grating, that could be easily cured by putting in an automatic valve below it."

If sewerage air has anything to do with the high death-rate of Glasgow children it is not from the gratings of proper disconnecting traps, but from leaking drains and soil-pipes, which leaks "X. Y." ideas would only make more dangerous.

There is also in Glasgow and other places the bad air from the sewers that comes up the gutter gratings at the edge of the pavements to blame for hurting the children. I have for long insisted on these being trapped, as I have often seen the children sitting over them, and have often felt foul sewer air blowing up them.

"X. Y.," like Mr. van Putten, thinks the houses would be safer by allowing the air from the public sewers to pass into the house-drains and up the soil-pipes. They both forget that this would also be letting in the sewer-rats into our houses, and the majority of people would not look upon this as an improvement.

I do not believe Mr. van Putten, "M.Inst.C.E.," when he asserts that the air in our public sewers is less dangerous than that in our house drains. The drainage of many houses has been so much improved of late years, that to do away with their ventilating disconnecting syphon-traps, and let in the sewer-air into their drains and soil-pipes—rats included—would be anything but an improvement.

When fever breaks out in one house or tenement, the disconnecting traps on the other tenements prevent them being contaminated from this fever-house.

Mr. van Putten, as an engineer, ought to know better than to write thus, supposing the high-level inlet to a drain is as high, or nearly so, as the outlet, that therefore the air currents "at a complete standstill." He forgets the effects of difference of temperature and of a good cowl on one of the ends.

As to "X. Y.'s" story of bottled-up gases in side-filled sewers forcing the disconnecting traps of houses and also of the sinks and closets in them, that is drawing the long bow. The rain-pipes and the ventilating-pipe of the soil-pipe should relieve these; and if it be really true that no ventilation has been provided by the public authorities for the sewers he refers to, such should be provided, altogether independent of the house drainage. For people to spoil their private drains, and let rats into them, in order to benefit the public sewers, would simply be equivalent to committing suicide.

W. P. BUCHAN.

### "SKY-SIGNS."

STR.—As I am sure many of your readers are interested in the above subject, I should like to ask, supposing a sky-sign is erected on premises adjoining my own, and a fire occurs, which causes the sign to topple over and crush my roof, to whom should I look for compensation? If I am insured, I should naturally ask the Insurance Companies to pay; but will they do it? There is nothing in my policy to lead me to believe they will.

J. C. MERRYWEATHER.

### DAINGEROUS ADVERTISEMENTS.

STR.—While the question of "sky-signs" is before your readers, may I call attention to another form of advertisement which, though not so common, is as dangerous and objectionable? It consists in covering the walls of a house with boarding, on which paper advertisements are pasted, on a larger scale than can be attained on the ordinary boarding, thus setting the Building Act at defiance, and facilitating the spread of fire in the best possible way.

There is a building in King William-street, near London Bridge, which has been covered in this manner from the first-floor to the parapet, for several years. Last week the boards were all removed, and it looked as if the law had been vindicated; but no—they have all been replaced, and

will, no doubt, be soon covered with pictures more glaring and irritating than ever.

In Mr. Barnister Fletcher's book on the Metropolitan Building Acts, a case is quoted in which this very proceeding was condemned by a magistrate, as clearly contrary to the Act, and rendering it nugatory. One would like to know if this decision has ever been overruled, and, if not, why it is not acted upon.

AN ARCHITECT.

### THE COLONIAL ARCHITECT, NEW SOUTH WALES.

STR.—Will you kindly correct an error which exists in the note from New South Wales in your issue of the 13th inst., where my old friend, Mr. W. L. Vernon, is stated to have formerly practised in London and Brighton? For the latter town, Hastings should be substituted. He never practised in Brighton.

RICHARD A. HILL, F.R.I.B.A.

### The Student's Column.

#### HOT-WATER SUPPLY.—XIII.

COVERING PIPES AND RESERVOIRS FOR THE CONSERVATION OF HEAT.

HERE is no branch subject in connexion with hot-water work deserving so much attention as this. It is no exaggeration to say that very shortly no apparatus for hot-water supply will be considered complete or finished if the whole system is not insulated, so to speak, so that almost every particle of heat absorbed by the water in the boiler will be obtainable from the taps, instead of nearly 50 per cent. of it being radiated from exposed surfaces, and worse than wasted.

There are at this moment hundreds, if not thousands, of hot-water systems that, by being carefully covered, would be converted from miserably inefficient to highly satisfactory appliances,—this in particular with the tank-system, when the tank is so commonly fixed in a cold, draughty roof.

An interesting instance of the success attending the covering of pipes occurred quite recently, in which a residence was fitted with a complete system of hot-water supply pipes on a scale sufficiently large for a good boiler in a 5 ft. kitchen range, but owing to a delay experienced in obtaining the range in question, another of a smaller size, 3 ft., was fitted up and connected to the chimney and circulating-pipes for temporary cooking and hot-water supply. It was not supposed that this little range with its boiler would do much in the way of water-heating, but to the astonishment of everyone it gave a really abundant supply of very hot water in every part of the house as quickly in the morning and altogether as satisfactorily as a larger range would be expected to do.

This desirable result was wholly brought about by the pipes and cylinder being everywhere carefully covered with a sufficient thickness of felt, so that however hot the water was within the pipes, no heat could be felt outside the covering, a sure indication that no heat was being dissipated.

It really does seem opposed to all reasonable and workmanlike principles to allow such abundant opportunity for heat to be thrown away, while labour and fuel is being expended in the kitchen apparently for this object. If a fitter or maker of steam-engines and appliances did not attend to the subject of this paper in a thorough and workmanlike manner he would be considered to have hardly mastered the rudiments of his business. The waste of heat is not always the only ill-result experienced, as in many instances the warmed air is very objectionable, and if a hot-water pipe is carried alongside a soil-pipe it is possible for a very unpleasant feature to introduce itself. It is a very customary practice for a hot-water fitter to carry his pipes up in the casing that is from the bottom to the top of the house, this casing containing all the different pipes of the house, such as the cold service from the main, the cold service down from cistern, the w.-c. cold-water services, and, very commonly, the soil-pipe. There is no objection to his making use of this casing if it is large enough to hold a few more pipes, and it is often used of necessity, as to carry pipes openly through well-decorated rooms is out of the question; but to carry hot-water pipes up this case without felting them is an exceedingly bad practice, as they are not only brought into contact with very cold surfaces (they have frequently been found

wired on to cold pipes, four or five pipes in a bundle), but the heat radiated causes a draught or current of air to set in, as we find in a chimney.

When a casing contains pipes that radiate heat, that casing, within a few moments after the heat is felt within it, is converted into a flue, as by applying heat to air it can be made to circulate to all intents and purposes like water. Air that is brought in contact with heated surfaces becomes heated and rarefied, and, being thus made lighter than the surrounding air, rises, and cold particles immediately flow in to take its place, they becoming heated and following the first particles, and so on, so that it resolves itself into a stream of warmed air, flowing out of the upper part of the casing, and cold air flowing in in corresponding volume below. This may be excellent in practice when hot-water pipes are used for effecting ventilation; but it is fatal to hot-water services which are particularly required to keep the heat within them; in many instances they are cooled at about the same speed as they would be if placed outdoors when a strong wind was blowing.

It may be argued, that if the casing is stopped off at its two extremities, the trouble will be obviated, and so it would be if the casing was perfectly air-tight everywhere, and had no cold pipes within it; but this is never the case, there are always numbers of crevices and apertures which permit of a tolerably free ingress and egress of air.

The best material for covering these pipes and also the reservoirs is hair-felt; hair is a natural poor conductor of heat, and nothing surpasses it for this purpose, especially as it is so easy of application. This felt, which is readily obtainable in sheets, is usually cut up in strips for pipe-work; the strips are wound upon the pipe spirally, being secured here and there with cord or wire, but where spiral winding is impossible it can be tied on in lengths, which answers equally well but has not such a good appearance.

The best and most complete arrangement for pipe-work, but which entails a little greater expense, is to have the felt wound on spirally in one direction, say from left to right, and secured with cord; then cover this with good canvas, also wound on, but in the opposite direction, and this secured with wire.

It is most necessary, to secure the best results, to have the felt thick enough; hair felt is sold in great quantities about  $\frac{1}{4}$  in. thick, but this is not thick enough for good work. If possible have it  $\frac{1}{2}$  in. thick, and a marked benefit will be had by using even thicker than this, or, say, two thicknesses of  $\frac{1}{4}$  in.

In felting cylinders, it is the best plan to take sufficient sheets of felt, and then sew the edges together to form one sheet large enough to go all round the reservoir. This sheet can then best be secured by bands of hoop-iron or brass passed round at top and bottom, and around the middle; these bands being tightened up by having a bolt to draw the two ends together, as fig. 27. After this circular pieces can be cut for top and bottom; these pieces being sewed on to the top and bottom edges of the large sheet. Tanks can be covered in exactly the same way.

Sometimes it is desired to encase the tank or cylinder with woodwork. This makes by far the neatest job, though more expensive, and it causes a little trouble should it be necessary to open the reservoir under some circumstances. If it is decided to have a casing it is very important that the space between the woodwork and the reservoir be well filled-in with some poor conductor of heat, such as cow hair (plasterers' hair), slag wool, or even dry sawdust answers very well when the casing can be filled from the top. If the casing is not "packed" with something it would be much better to be without it, as it would have a current of cold air passing up through it the same as explained with the general pipe casing just referred to.

If the hot-water service-pipes are carried up through the house without entering the general pipe casing mentioned, and it is proposed to encase them for the sake of appearance, this casing must also be packed for the reasons explained, but this is frequently neglected with the worst results, as the casing of pipes is frequently done for appearance sake only, the question of radiation not being considered.

Occasionally it is found practically impossible to carry the pipes up inside the house, in which



case it becomes necessary to carry them outside. This is very objectionable, but where it cannot possibly be avoided the objections do not avail, but they must be guarded against. In the first place, the pipes must be encased, and the casing ought to be of fair size, so that 1½ in. of packing can be filled in between the woodwork and any of the pipes. The packing must fill the case tightly, and it is imperative that the casing be well and tightly secured to the wall, as should it get loose the woodwork and the packing will come away from the pipes, and leave them exposed.

When pipes are carried outside, the packing is not only needed to prevent great waste of heat, but there is a danger to be guarded against in cold weather, when the pipes are liable to be frozen and an explosion possibly ensue, as the only outlet for any steam that may be generated in the boiler is at the upper extremity of the expansion pipe, unless a safety-valve is provided.

#### OBITUARY.

**MR. JOHN MOSSMAN, SCULPTOR.**—The *Glasgow Herald* announces the death of Mr. John Mossman, sculptor, which took place on Monday morning last, at Port-Bannatyne. Mr. Mossman was in his 74th year. He was born in London in 1817, his father at that time being in the employment of Chantrey. While John was still young his father removed to Scotland, and established himself in business in Leith. Young Mossman assisted his father and became his right-hand man, doing excellent work and much of it. He was, however, anxious to rise in his profession, and in order to further his art-training, he studied for some time under Baron Marochetti. His progress was steady and thorough, and when thus fairly equipped he came to Glasgow, and, with his brother George, established the monumental works still carried on in Mason-street. Mr. George Mossman died about fifteen years ago. In George-square, Glasgow, the statues of Sir Robert Peel, Dr. Livingstone, and Thomas Campbell, the poet, were executed by him; and in Cathedral-square, he put up the statues of the late Rev. Dr. Norman Macleod and Mr. Lumsden. Several years ago Mr. Mossman was elected H.R.S.A.

**THE REV. CHARLES ROGERS, D.D., LL.D.**, died at his residence in Edinburgh on the 18th inst., at the age of sixty-five. The deceased was indefatigable in his endeavour to perpetuate the memory of eminent Scotsmen. His work was mainly literary, but his name was most prominently brought before the public in connection with the movement for the erection of the Wallace Monument on the Abbey Craig, near Stirling. This memorial cost £14,000, and was inaugurated on September 12, 1889, and is in the form of a peel tower, surmounted by an open crown. The tower contains a "Hall of Heroes," where are the busts of several eminent Scotsmen, which are from time to time being added to. Dr. Rogers also took the leading part in the erection of the statue of Robert the Bruce on the esplanade of Stirling Castle, which was completed in 1877, and he took a similar part in the erection of the statue of Hogg, the Ettrick Shepherd, at St. Mary's Loch.

**MR. THOMAS NELSON.**—The death is announced of Mr. Thomas Nelson, who was for many years engaged in business in Carlisle as a builder and railway contractor. Mr. Nelson made a valuable collection of Burns's manuscripts and other relics.

#### GENERAL BUILDING NEWS.

**THE VICTORIA LAW COURTS, BIRMINGHAM.**—The *Birmingham Gazette* reports that the internal fitting of the new Law Courts in Corporation-street is being pushed forward as rapidly as possible, but it is not expected that, under even the most favourable conditions for the work which yet remains to be done, they will be ready for occupation before the end of March next. The panelling of the three police courts, the coroner's court, and the two assize courts, is now practically finished. The floors in the principal corridors and of the courts are of oak, the remainder in pine. All the oak used has been fumigated, to destroy the louse and preserve the wood, and the whole of the carving has been executed in the workshops of Mr. John Bowen, the contractor for the erection of the courts. Now that the buildings are nearing completion, it is seen (says the *Gazette*) that the plan of the six courts, the three police courts and the coroner's court, is better adapted to the great hall, and the two assize courts in the rear, is as convenient as it could possibly be, and so far as can be judged, the internal accommodation will be both sufficient and satisfactory. The police block fronting to Steelhouse-lane is practically ready for occupation, and the administrative departments in connexion with the courts are ample and convenient. The electric light will be used through the entire block, and the change from the original contemplation, which was to use gas, has caused considerable delay in the completion of the courts. The architects of these buildings are Messrs. Aston Webb and E. Ingress Bell. We gave

a view and plan of their design in the *Builder* for July 31, 1886. We also illustrated the sculptural treatment of one of the gables of the building in our number for Dec. 21, 1889.

**RUARDEN CHURCH, GLOUCESTERSHIRE.** was reopened on the 23rd inst., the work of restoration being nearly complete. This work has been carried out from the designs and under the direction of Messrs. Warrall & Sons, architects, Gloucester, at a cost of 2,000, the builder being Mr. H. J. Smith, of Wolverley, Kidderminster. The north and south walls of the chancel, the south-east wall of the aisle, and the entire north wall of the nave, have been repaired. The oak roof of the chancel has been repaired. The roofs of the nave and south aisle have been replaced by new roofs of pitch-pine.

**THE NEW MUNICIPAL BUILDINGS, NEWCASTLE-UNDER-LYME.**—On the 23rd inst. a public inquiry was held at the Town Hall by Mr. Thomas Coddington, M.Inst.C.E., as to an application by the Corporation for sanction to a loan of 8,500, for sewage and street improvement work. There was also conjoint an investigation as to the Town Council's expenditure upon the public buildings. A mass of evidence was taken, and the Commissioner will make his report in the usual course.

**MESSRS. HUDSON BROTHERS' NEW PREMISES ON LUDGATE-HILL** have now been completed and opened for business. They have been built from the designs and under the supervision of Messrs. J. W. and R. F. Beaumont, architects, the lower part of the frontage being of grey and red granite, supplied by Messrs. Whitehead & Sons, of Aberdeen. The upper part is faced with Bracknell red bricks and Mansfield stone dressings. The premises, of course, look all the better now that Messrs. Hudson have been so well-advised as to take down their "sky-sign."

**THE PRINTERS' ALMSHOUSES AT WOOD-GREEN.**—A movement is on foot for extending these buildings by covering part of the asylum grounds now vacant, and so providing residences for four additional inmates. It is estimated that 5,000, will be required for the purpose, and a permanent endowment the whole building. To this end liberal contributions are urgently solicited.

**NURSES' HOME, ROYAL INFIRMARY, EDINBURGH.**—On the 22nd inst. a conference took place between the members of the Edinburgh Dean of Guild Court and the Infirmary managers with reference to the nurses' home which the managers propose to build on the grounds. There being a greater want of accommodation in the Infirmary for the nursing staff, the managers some time ago placed a commission for plans in the hands of Mr. Sydney Mitchell, architect. The site selected was the open space between the two westernmost pavilions of the surgical and medical sides of the hospital—that is to say, the ground to the north of the westernmost medical wards and south of the westernmost surgical wards. Mr. Sydney Mitchell's plan shows a two-story building occupying a square of about 120 ft. The buildings (according to the *Scotsman*) are grouped on four sides of this square, leaving a square of 60 ft. across in the centre. It provides 140 small bedrooms for the nurses, and a dining-hall. When the Dean of Guild Court proceeded about three weeks ago to consider the plans, they found that without warrant the managers had put in the foundations of the new building. The Court, however, apart from this, asked time to consider the plans, as the members were strongly adverse to seeing the only remaining open space of the Infirmary grounds built over. They argue, and apparently with justice, that this is a departure from the original pavilion scheme on which the hospital was built, which was specially adopted to secure the maximum of light and air; and objection is also taken to the plan of the building, enclosing, as it does, a hollow square, which is prejudicial to the free circulation of air. For a building which is to be used both day and night for sleeping purposes, it is contended that a plan of this nature is not the best that could be adopted. No decision was come to, but the general feeling appeared to be that the Dean of Guild Court was really powerless in the matter, and that the building would have to proceed.

**ALDBROUGH CHURCH, in the North Riding of Yorkshire,** which has been built at the expense of the Dowager Duchess of Northumberland, at a cost of 1,500, was consecrated on the 23rd inst., by the Bishop of Ripon. It will seat 120. It is in the Early English style. The architect is Mr. W. T. Hicks, of Newcastle, and the work has been carried out by two denizens of the village, Messrs. Ivison & Brown, who contracted for it.

**PUBLIC BATHS AND CENTRAL POLICE STATION FOR LINCOLN.**—At the meeting of the Lincoln Town Council on the 17th inst., a general combined scheme for the erection of public baths and wash-houses and a new central police station, was adopted. The cost of the scheme is not to exceed 15,000.

**NEW SPINNING MILLS IN THE BOLTON DISTRICT.**—According to the *Leeds Mercury*, several new spinning mills are about to be erected in the Bolton and the spindle power increased by at least half a million spindles, bringing the aggregate to close upon seven millions.

**THE NEW MARKET HALL AT SANDRACH, CHESHIRE,** built on a site given by Lord Grosvenor, has also renounced his claims in the future to the market tolls, is rapidly approaching completion. The cost of the building is about 4,500.

**LABOURERS' DWELLINGS, CASTLEFORD, YORKS.**—On Tuesday evening last Colonel John Old Hasted, R.E., held a Local Government Board inquiry, at the Local Board offices, Castleford, relative to a proposed scheme for new dwellings for persons of the labouring classes submitted to the Local Government Board, in lieu of those the North-Eastern Railway Company propose to destroy in constructing a new branch of railway in Whitwood Mere. Mr. Gibb, the solicitor to the North-Eastern Railway Company, opened the case on their behalf, and said that the North-Eastern Railway Act of 1859 gave them power to provide a branch line in the parish of Whitwood Mere. They had found it necessary to purchase thirty-three houses, and they required to destroy twenty-six of them. Their scheme to the Local Government Board was to build thirty-six new houses within half a mile of the old ones.

#### SANITARY AND ENGINEERING NEWS.

**HOOLE, NEAR CHESTER.**—On the 12th inst., Mr. T. Coddington, C.E., Local Government Board Inspector, sat at All Saints' Schools, Hoole, Chester, to inquire into the proposal of the Hoole Local Board to borrow 1,000, for the purpose of certain street improvements in the district. The Clerk to the Board (Mr. J. P. Cartwright), in explaining the position of the district, said that a large proportion of the railway men and industrial classes amongst the residents had complained of the bad condition of Philip-street and Walken-street. The Board considered those streets ought to be renewed, and had decided to do so to the extent of which they had already given notice to the owners and frontagers. Since 1855 the Board had borrowed, with the sanction of the Local Government Board, a total of 6,350, and 4,000, was repaid of that sum.

**PROPOSED NEW HARBOUR AT WHITEHILLS, BANFFSHIRE.**—The papers state that Messrs. D. & T. Stevenson, the civil engineers of the Fishery Board, have finished their marine survey of the bay in which it is proposed to construct a new harbour at Whitehills, about a couple of miles to the west of Banff. At low water the present harbour is entirely dry, and it extends to only 0.35 acre, according to the plan prepared by the engineers, the whole area of the proposed new harbour would extend to about 0.60 acre, and at high water to 1.6 acre. The engineers estimate the cost at about 9,000. The depth of water in the new harbour will allow the largest boats to come in practically at all states of the tide and discharge their fish.

**ASTON AND TRETON WATER SUPPLY.**—On the 11th inst., the work undertaken by the Rochester Rural Sanitary Authority in connexion with the supply of water to the districts of Aston, Catfild, Olgreave, and Treton was completed. The cost of the undertaking has been about 5,000.

**WATER SUPPLY AT UTOXETER.**—At the monthly meeting of the Utoxeter Sanitary Authority, on the 10th inst., the Medical Officer of Health reported, with reference to the intermittent water supply, that the reservoir at Utoxeter, when built, was possibly large enough to contain a supply sufficient for the bare necessities of the inhabitants, but was now found quite inadequate to meet the demands, and the question must now be grappled with by the Sanitary Authority. The reservoir, when full, held about 66,000 gallons, which, as an ordinary computation would not be considered sufficient for one day's supply. The matter was referred to a committee for consideration.

**THE SANITARY CONDITION OF THIRSK.**—On Monday last, at a meeting of the Local Sanitary Authority, the Vicar of the Parish, Rev. W. Teesdale Mackintosh, appeared, and complained of the unsanitary condition of the town, pointing out that it had not been free from fever for a long time. The Vicar submitted a number of propositions for putting the town into a good sanitary condition, but the Authority seemed to think (judging by the report in the *Leeds Mercury*) that the 10,000, or 15,000, necessary to carry them out was too great a price to pay for the improved health of the town.

#### FOREIGN AND COLONIAL.

**FRANCE.**—The municipal authorities of Calais propose to inaugurate next month a monumental group, designed by M. HOLLIN, to the memory of Eustache de St. Pierre.—In the course of the cutting and embankment works for the new railway line from Mantes to Argenteuil, a well-preserved Gallo-Roman burying-ground has been discovered near Andresy. More than 150 sepulchres have already been found, containing numerous objects, such as coins, jewels, and pottery, which will be preserved in the museum of St. Germain.—The required documents in regard to the scheme for a ship canal between Paris and Rouen have just been deposited at the Hôtel de Ville, Paris. The project has the support of the Minister of Public Works, but is unfavorably regarded by the "Corps des Ponts et Chaussées." The cost is estimated at 135



## MISCELLANEOUS.

**THE ALEXANDER THOMSON MEMORIAL.**—A meeting of the Trustees, held in Glasgow on Thursday, the 18th inst., Mr. John Gordon, President of the Glasgow Institute of Architects, in the chair, the prize (value £50) of the Travelling Studentship for the best set of drawings of a hall with side rooms was awarded to Mr. Chas. R. McIntosh, of Dennistown, Glasgow. The drawings sent in competition were exhibited in the Corporation Galleries.

**REQUESTS IN AID OF ARTISTS.**—By the will of the late Mr. Patrick Allan-Fraser, of Hospitalfield, Arbroath, there is to be put in operation a scheme for the assistance and encouragement of young men desirous of following out the professions of painting, sculpture, architecture, carving, or engraving. Funds are also to be bestowed to provide for the comfortable maintenance of aged or infirm professional men, painters, sculptors, or literary men. Various other benevolent bequests, and a large number of legacies and annuities, are also specified. Mr. Allan-Fraser, who was the last of his race, was a painter and an honorary member of the Royal Scottish Academy. He designed and carried out an elaborate and costly mortuary chapel for the reception of the remains of his late wife, and is the author of various publications.

**THE FAN-MAKERS' COMPANY.**—The prizes awarded by this Company to the successful competitors in the recent annual design competition held at the Royal Albert Hall were on Tuesday afternoon presented by the Lady Mayoresse, in the Egyptian Hall of the Mansion House. Mr. Homewood Crawford, Senior Past Master of the Company of Fan-Makers, at the request of the Lord Mayor, made a brief statement of the objects and results of the exhibition, remarking that the art of fan-making in this country had not been cultivated to any great extent in this country during the present century; but he was happy to say that the efforts of the Company had had the effect of so stimulating the industry that fans of the most beautiful and complex workmanship—hitherto supposed to be incapable of complete production in England—had been manufactured in this country without recourse to foreign aid.

**THE ENGINEER TO THE CITY COMMISSION OF SEWERS.**—We regret to hear of the somewhat serious illness of Colonel Haywood, the Engineer to the City Commission of Sewers. At the meeting of the Commissioners on Tuesday last, the Chairman (Mr. Deputy Green) expressed his deep regret at the receipt of a letter from Colonel Haywood, stating that his health was very far from what he must from necessity desire himself, or that which the members of the Court desired. He had sought the healing influences of Carlsbad, but he had to return home, where he was transacting the business of the Commission, which fell to his department, and he was well informed of everything that went on. For the moment, therefore, he asked that he might be excused from attending before the Commission or before the Committees. This request was unanimously granted.

**PROPOSED MEMORIAL TO THE LATE DEAN OF MANCHESTER.**—The Manchester Committee, of which the committee who have under their consideration the proposal to establish a memorial to the late Dean of Manchester have unanimously decided that the memorial shall take the form of a pulpit in the nave of the cathedral.

**TECHNICAL CLASSES AND LECTURES.**—With the approach of the winter months the many technical classes and courses of lectures are about to commence. The Birkbeck Literary and Scientific Institution, Bream's-buildings, Chancery-lane, commences its sixty-eighth session on Wednesday next. Among the classes and lectures there we may mention those in Quantity Surveying, conducted by Mr. H. Bushell, F.A.S.I., and on Building Construction, conducted by Mr. W. H. Martin. At this Institution, also, Mr. G. F. Harris, F.G.S., is commencing a course of lectures on "Applied Geology," with special reference to the requirements of architectural and engineering students.—The Working Men's College, Great Ormond-street, Bloomsbury, founded by the late F. D. Maurice, re-opens its thirty-seventh session on October 6. The classes announced include as usual, all the subjects which may be regarded as necessary for a liberal education; and at a price which places them within the reach of the poorest working man.—The City of London College, White-street, Moorfields, announces that its forty-third session commences on Wednesday next. The Secretary sends us the syllabus of lectures in the Engineering Department, by Professor Henry Adams.—The winter session of the Charterhouse Science and Art Schools and Literary Institution, one of the largest Science and Art Schools in the United Kingdom and a school which has trained some thousands of teachers for the offices of science lecturers, commences this Saturday, September 27.—The Bow and Bromley Institute, which is doing very good work, has just commenced its first half of the winter session.

**THE NINETEENTH CENTURY ART SOCIETY.**—Monday, October 8, has been appointed for the reception of Works of Art intended for the Autumn Exhibition (the Twenty-second) of the Nineteenth Century Art Society at the Conduit-street Galleries.

**THE ENGLISH IRON TRADE.**—The English iron market is in a rather disturbed condition, owing to the dispute between the Scotch ironmasters and the blast-furnace men. The Glasgow warrant market has been greatly excited thereby, and prices have been going up all the week, while makers' quotations are rather unsettled, but they are nearly all higher. The condition of affairs has influenced prices in the North of England, Cleveland pig No. 3 having risen 2s. 3d. per ton. The effect of the Scotch dispute has made itself less felt in the southern markets, but prices there are stiffer. There is greater activity in hematites, which have gone up 1s. 6d. per ton. Early owing to the rise in pig, finished iron and steel have been pushed up; but there is a good demand as well. Ship-builders are more busy in consequence of the orders they have recently booked, and engineers are also doing better.—Iron.

**LABOUR DISPUTES.**—The Dundee Masons' strike has ended by the men accepting the masters' offer of an advance of 4d. an hour. The men came out for 3d. advance. The strike has lasted fully six weeks. The wages to April 1 next will now be—7 1/2d. per hour to hewers, and 7 1/2d. to builders.—On Tuesday evening last a meeting was held at the Memorial Hall, Farringdon-street, convened by and in support of the National Union of Stone-Grate Workers, which, as the outcome of a strike at Rotherham in the early part of this year, has already, it is said, 2,000 members, and a footing in eight provincial towns—Mr. Tom Mann, president of the Dock, Wharf, Riverside, and General Labourers' Union, who occupied the chair, remarked that the main object of that meeting was the strengthening of the London branch of the National Union of Stone-Grate Workers. There were 15,000 of these workers in the various branches of the trade in the metropolis, who laboured during excessive hours for too low pay. Mr. Clements moved a resolution pledging the meeting to support the workmen of Messrs. H. & C. Davis, of Camberwell (who are out on strike), by joining the union and by using every legal means to "prevent anyone taking a job there so long as the dispute lasts." The resolution was adopted.

**THE SOUTH WALES ART SOCIETY AND SKETCHING CLUB** announce that their third annual exhibition will be opened in the Public Hall, Queen-street, Cardiff, on or about November 15 next. The Committee announce that they are prepared to receive the following for exhibition:—Recently-executed pictures, drawings and sketches in all mediums, and on all materials ordinarily in use, sculpture and modelling, carving in wood, stone, and other materials efficient for the purpose; metal-work, inlaying and mosaic in panels; and small articles of furniture or fittings, &c., which display artistic design or workmanship. The hon. sec. is Mr. J. A. Sant.

**PROPOSED "PEOPLE'S TEMPLE" FOR LONDON.**—There is a project on foot in London (says the London correspondent of the *Manchester Guardian*) to build a "People's Temple" by covering a space wherein at least 100,000 persons could assemble for the discussion of topics of public interest. The idea is that by roofing an area as large as Russell and Bedford squares there would be an end to such dissatisfaction as has attended the loss of Trafalgar-square for meetings, and that such a temple would square for meetings, and that such a temple would be free from the disadvantages of Hyde Park. The People's Temple is to be beautiful, and subdivisible when required, so that discussion on many subjects could be going on at the same time. So far the London correspondent. When the funds and the site for the proposed building have been procured it will be time enough to think of solving the problem which this probably imaginary scheme would involve.

**A CLERGYMAN WORKING AS A MASON.**—What is described as "a novelty in church restoration" affords material for a paragraph in all the newspapers. It is stated that the restoration of the parish church of Marsworth, a village near Tring, has been accomplished under extraordinary circumstances. The Rev. F. W. Ragg was appointed to the vicarage in 1880, when, notwithstanding some partial works which had been executed, he found the principal parts of the church—the windows, walls, buttresses, roof, and tower itself—in a very unsound state. About 2000l. was subscribed towards the restoration; but, although this was altogether inadequate, Mr. Ragg set to work himself as an ordinary mason, and with the aid of one worker in stone, and a few farm-labourers, who voluntarily assisted, he accomplished all that could under the conditions be done. With this help alone he restored the windows, took down the dangerous buttresses and rebuilt them, aligned the south wall, and with the aid of a carpenter raised the roof of the nave. He then had no funds left wherewith to pay the mason and carpenter for further services, but he kept on with the work, completing buttresses and walls, building a parapet, refacing the tower, cutting and erecting a chancel arch, &c. Then an attack of rheumatic fever, due to exposure when working, disabled the energetic clergyman, but on his recovery he put in several windows and completed other work." If our memory serves us, this is not the first instance of the kind during the last fifty years.

million francs, and the probable time of transit for vessels between Rouen and Paris at seventeen hours.

It appears that the new bridge over the Saône, built with the funds left by the late Madame Boucicaut, has already shown signs of failure, and the engineers commissioned to report on its condition consider that immediate operations will be necessary to strengthen the foundations.—A new line of railway, entirely strategic in character, is contemplated between Belfort and Les Vosges, on the recommendation of the War Department. It will be carried out by the Compagnie des Chemins-de-fer de l'Est.—The Municipality of Besançon has voted a subvention of 100,000 francs for the erection of a large hydropathic establishment there, to be carried out on the most complete system.—A committee has been formed at Bordeaux to organise an artistic, industrial, and agricultural exhibition in that town in 1891, when it is proposed to repeat or reproduce some of the principal attractions of the Paris exhibition of 1889. The exhibition is to be held on a large estate outside the town and connected with it by a Decauville railway.—In the Department of the Eure the works necessary for carrying the water of the Avre to Paris were commenced some weeks ago. The water will be conveyed to Paris by way of St. Cloud, where a large reservoir is to be made. The "Moulin Jacob," on the route from Burgues to Dunkerque, and well known to antiquaries as probably the oldest mill in France, is about to be pulled down.—A group of architects, former pupils of the École des Beaux Arts, are endeavouring to establish a professional association at Limoges.—The official inquiry held on the Metropolitan railway scheme for Paris submitted by the Eiffel Company, has resulted in a majority of votes against the concession to that Company.—The City authorities of Paris are about to commence the formation of a new public gymnasium, for which the iron structure erected in the Court of the Tuilleries, for the temporary accommodation of the Postal Service, will be utilised.—The Paris "Ceinture" Railway Company has commenced the reconstruction of the Pont de Flandres at the end of the street of that name.—A new bridge is to be proceeded with at Conflans, between Ivry and Charenton. The proposed bridge will run to 200 metres in length, and will be 16 metres in width. The cost is estimated at over a million francs.

**FLORENCE.**—According to *La Construction Moderne*, a museum is to be established at Florence in which will be collected everything relative to the history and design of the Cathedral, under the title of Museum "dell'Opera del Duomo." The same journal states that a number of architectural drawings by Sansovino, Peruzzi, Bramante, and San Gallo, at present hidden away in the Uffizi galleries, are to be framed and exhibited as a portion of the Uffizi collection.

**THE NORTH-SEA AND ALBERT CANAL.**—According to a paper read by Gen. Ober-Bach at Barmah (Berlin), the construction of this canal has been progressing favourably this summer, and the work is likely to be complete by the autumn of 1895, if unforeseen difficulties are not encountered. The canal will have a length of 88·6 kilometres, 62 of which are in a straight line, whilst the rest are on curves, with radii varying between 5,000 and 1,000 metres (1,000 metres being the smallest radius considered advisable for easy passage of modern ironclads or merchant vessels of great tonnage). In working out the sections, the measurement, "22 metres bottom, 53 metres surface, 8½ metres depth of water" taken as a minimum suitable for men-of-war passing at low water. Every 12 kilometres, extra width has been given for siding purposes, such sidings having 60 metres bottom to a length of 450 metres. The cubic metres of ground to be moved have been calculated at 78,000,000 (see *Builder* of May 17) to 80,000,000, of which 15,000,000 have been moved up to date; and for this enormous piece of work there are employed 6,670 workmen, aided by 27 land- and 24 floating-dredges, 4 elevators, 97 engines, 2,700 trucks, 15 steamers, 51 dredge-boats, and 37 steam-pumps, representing a capital of some 12,000,000 marks, or nearly 600,000l. At either end of the canal twin-locks have been planned, each of these four structures having a length of 216 metres; and seawards of these, outer and inner harbours (the latter with some 500 metres quay frontage each) have been designed. Of other structures of importance on the line of the canal, we may mention the lock connecting the new waterway with the old waterway at Calais. Land traffic on the new canal will be worked by five swing-bridges, a fixed bridge, and several ferries; the swing-bridges, when open, permitting a free passage of 36 metres width, the fixed bridge permitting the passage of vessels with mast-heads forty-two metres above water.

**MEMORIAL TO THE AUTHORS OF "JOHN HALIFAX."**—Soon after the death of Dinah Maria Mulock (Mrs. Craik), in 1887, a scheme for the erection of a suitable memorial of her work was started by some of those who prized that work. It was decided that the memorial should take the form of a marble medallion in Tewkesbury Abbey. The memorial has now been placed in the Abbey. It is the work of Mr. H. H. Armistead, R.A.



## COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITION.

Nature of Work.	By whom Advertised.	Prize.	Designs to be delivered.
*Plans for New Cemetery . . . . .	Milton Mowbray L. B.	50 and 10 guineas.	Jan. 30/91

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Three Residences, Ebbw Vale . . . . .	Newell, Abbot, U. R. & A.	R. E. Hughes	Sept. 29
Three Houses, Cardiff . . . . .	Trustees of Welsh Presbyterian Church	Samuel Pagar	Sept. 29
Cottage at New Llandow, Ebbw Vale . . . . .	Philips (Newcastle-on-Tyne) Local Board	Chas. Rice	do.
Disputary Buildings, Flint Road Metal, Hove, Brighton . . . . .	Belstaff Union	Young & Mackenzie	do.
Cast-iron Pipes and Castings (400 tons) . . . . .	St. George's (Bristol) Trustees	J. & A. Leslie & Read	do.
Roadmaking, &c. . . . .	W. S. A. New Malden Ld. Bd.	Official	do.
Road Metal . . . . .	Bromley Local Board	Official	do.
Additional, &c. to Model Lodging House . . . . .	Glasgow Imp't. Trust	Official	do.
Turnip to Houses, Elliot Town New Tredegar . . . . .	Powell Duffryn Co.	Official	Oct. 1
Kerbing and Channeling . . . . .	Shirley and Prestons Local Board.	H. J. Weston	do.
House, Shop, Carriage Shade, &c. Southampton . . . . .	J. Bettridge	Leaman & Bland	do.
Repairing Groynes . . . . .	Hove Commissioners.	Official	do.
Two Detached Villas, Ashburton, Devon . . . . .	Ashturton Building Co. (Lim.)	W. Rowe	Oct. 2
Road Improvement Works . . . . .	Halifax Corporation.	E. R. S. Esott	do.
New Street and Egyptian Bazaar Houses, Halifax . . . . .	Bethnal Green Vestry	Jackson & Fox	do.
*Paving Carriageway . . . . .	Shedfield Sewerage Co. Committee	P. W. Barrett	do.
Entrance Lodge to Recreation Ground . . . . .	(Tyne) Local Board	Official	Oct. 3
Main Brick and Pipe Sewers . . . . .	Sheffield Sewerage Co. Committee	G. Alcock	do.
*Making up Roads and Paving Crossings . . . . .	Erigen Barnett Ld. Bd.	Borough Engineer	Oct. 4
Re-building Destructor, Burntcliffe, Leeds . . . . .	Official	do.	do.
Cottage and Garden Walls, Trehan, near Balaish . . . . .	Ban Commun Ld. Bd.	Mr. W. H. R.	do.
Providing and Fixing Kitchens (2,000 feet) . . . . .	Trinity House Corp.	Official	do.
Two Storey Bell House . . . . .	do.	do.	do.
Alterations and Additions to Property, Grutlows, N.B. . . . .	do.	Geo. Sutherland	do.

Those marked with an Asterisk (\*) are advertised in this Number.

## CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Steam Boiler . . . . .	Bernumsey Vestry	Official	Oct. 6
Supply of Edge Corning . . . . .	do.	do.	do.
Leveling, Metalling, Draining, &c. Roads . . . . .	Winder R.S.A.	Wm. Manley	Oct. 6
*Sorting Office, South Woodford . . . . .	Com. of H.M. Works	Official	do.
*New Road . . . . .	Brantford Local Board	J. H. Strachan	do.
*Four Cottages, Basingstoke Station . . . . .	G.W.R. Co.	Official	Oct. 9
*Rebuilding "Plough Inn," Coventry . . . . .	J. Eadie, Esq.	H.W. Chattaway	do.
*Repainting Chimney Stacks and Shaft . . . . .	Shoreditch Guardians	F. J. Smith	do.
*Six Tanks and Buildings for Sewage Treatment . . . . .	do.	do.	do.
New House Schools and Master's House . . . . .	Crowther, S.A.	Official	Oct. 9
Cemetery Chapel . . . . .	do.	do.	do.
Refrigerating and Fencing . . . . .	do.	do.	do.
Sewerage, Pipe Laying, &c. . . . .	Swindon School Board	B. Bayard	do.
*Section of School . . . . .	do.	do.	do.
*Machinery for Sewage Disposal Works . . . . .	Tolington Local Bd.	Official	Oct. 13
*Sewerage, &c. . . . .	West Sussex C.C.	Official	do.
Drainage and Water Supply to Workhouse . . . . .	Union Union	Official	Oct. 14
*New Police Court, Warrimoor . . . . .	Com. of H.M. Works	Official	Oct. 15
New Church, Waterdale, Doncaster . . . . .	do.	do.	do.
Sinking Pit Shaft (30 fathoms) . . . . .	do.	do.	do.
Additions and Alterations to Workhouse . . . . .	do.	do.	do.
Postoffice . . . . .	Castle Ward Union	W. Lister Newcombe	do.
Catholic Infant School, Wallendene, Northampton . . . . .	do.	C. Walker	do.
Seven Houses, Rother House, Chisney, & Bramley, Leeds . . . . .	do.	do.	do.
*Surveyor, Inspector of Nuisances . . . . .	do.	do.	do.
New Board School . . . . .	do.	do.	do.
Masonry and Excavating Barton Manor House . . . . .	do.	do.	do.
House and Draining, Edithburgh . . . . .	do.	do.	do.
House and Three Cottages, Cowbridge . . . . .	do.	do.	do.
*Superstructure of New Offices, Leeds . . . . .	do.	do.	do.

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Surveyor, Assistant . . . . .	Batting Town Comm.	29 5s.	Sept. 29
*Surveyor, Inspector of Nuisances . . . . .	do.	100	do.
*Clerk of the Works . . . . .	Bernumsey P. L. Com.	40	Oct. 7
*Clerk to the Board . . . . .	Bernumsey Local Board	4000	Oct. 13
*Two Foremen of Works, Gold Coast . . . . .	Crown Colonies Agents	250	Oct. 15

Those marked with an Asterisk (\*) are advertised in this Number. Competition, p. iv. Contracts, pp. iv., and v. Public Appointments, p. xvi. and xvii.

## LEGAL.

## LIVERPOOL CONSISTORY COURT:

## FACILITIES FOR NEW WORKS.

A SITTING of the Consistory Court for the Diocese of Liverpool was held on Tuesday afternoon at St. Nicholas's parish church, before the Rev. Canon Stewart, surrogate to the Chancellor. The following report of the proceedings is from the *Liverpool Post*:

An application was made by the Rev. Canon M. Neale, of St. Paul's Church, Prince's Park, for a faculty to erect a carved oak reredos by the east window of the chancel, having in it a copy of "The Last Supper," of Leonardo da Vinci. The reredos is to be erected at the expense of Mr. and Mrs. W. Nicol, of St. Michael's Hamlet.

The faculty was decreed by the Court, as was also one asked by the Rev. G. Howell, of Christ Church, Everton, for the re-flooring of the chancel with white and red marble, at the expense of Mr. R. G. Dalgleish.

A faculty was granted for the insertion in the east window of the parish church, Farworth, of stained glass, the central subject of which is to be the Saviour on the Cross. The Rev. J. R. Jones, who made the application, explained that the window—which would cost from 300l. to 400l.—was being erected by Mr. Moss Horsfall in memory of his great grandfather, the Rev. Thomas Moss, who was for forty-seven years vicar of the parish, and who died and was buried in the district 100 years ago.

An application by the Ven. Archdeacon Clarke for a faculty to insert in one of the side windows of Christ Church, Southport, a stained-glass window, with the subject, Christ, the Good Shepherd, in memory of the late Mr. Pearman—once curate of the church, but who died last October—was granted.

**PARTNERSHIPS.**—Mr. W. J. Gant, architect, Hastings, has taken into partnership Mr. C. H. Slater, of Nottingham. The style of the firm will be "Gant & Slater." Mr. John H. Fraser (late in partnership with his brother, Mr. G. C. Fraser, as Fraser & Fraser, at Bromley-by-Bow), has now, we understand, taken works at Millwall, which are being fitted with the newest machinery and plant for the production of boilers, bridges, tanks, &c. He has taken into partnership his son, Mr. Harry J. Fraser, who has a practical knowledge of the trade, and the firm will be known as John Fraser & Son.

**FAILURES IN THE BUILDING TRADES.**—According to *Kemp's Mercantile Gazette*, the number of failures in the building and timber trades gazetted in England and Wales during the week ending September 20 was only seven, as compared with 13 in the corresponding week of 1889, and 10 in the corresponding week of 1888.

## MEETINGS.

## SATURDAY, SEPTEMBER 27.

Association of Public Sanitary Inspectors of Great Britain.—Visit to the Crematorium at Woking. Train from Waterloo Station at 2.17 p.m.

THURSDAY, OCTOBER 2.  
University College.—Professor Roger Smith on "The Technical Education of Architects." 7.30 p.m.

FRIDAY, OCTOBER 3.  
Sanitary Institute (Lectures for Sanitary Officers).—St. Douglas Galton on "Ventilation, Warming, and Lighting." 8 p.m.

## RECENT PATENTS:

## ABSTRACTS OF SPECIFICATIONS.

15,713.—VENTILATING ROOFS, &c. T. W. Helliswell.—The object of this invention is to ventilate the roof of a building in such a manner that, whilst allowing for the entrance and egress of atmospheric air, snow, rain, &c., is prevented from entering. This is claimed to be effected by curving the struts upwards, and by the use of louvers also curved, so as to overlap each other, keeping out the rain but admitting air.

1,308.—ROUGH-GLAZED AND COLOURED FACINGS.—A. Bond.—According to this invention, the facings-stones are made under pressure in moulds. The stones are rubbed with a scraper, and, where necessary, are coloured with a weather-resisting mixture or facing. Glazing is applied in a manner similar to the water-glaze process.

3,827.—GUARD OR SHIELD FOR PAINT-BRUSHES. J. E. Pepper.—By this patent a guard or shield is fitted to the brush. This guard is of tubular shape, with one end closed, and is screwed into the handle of each brush, the open end enclosing the brush so as to have only as much of it projecting as may be required. As the brush wears by use the shield is screwed up the shank, so as to leave sufficient protection for the brush. The guard or shield may also be enlarged by making a flange on the closed end, which will give it sufficient buoyancy to float in the water.

4,399.—MORTISING MACHINES: T. R. Lees.—The machines which are the subject of this patent have a revolving shaft and crank, and a combination of adjustable levers and balance-weight, giving a variable and reciprocating motion to the chisel operating upon the lever.

4,935.—WOOD-BLOCK FLOORING: C. J. Longley.—According to this invention, a tapered groove runs along the side of the blocks to receive the tapered ends of the lower portion of the blocks. The upper portions of the blocks are cut square, but the lower portions are a little longer at each end to fit the grooves referred to.

5,878.—WATER-CLOSETS: W. Macanema.—This invention consists of a box of a size and shape to enable a person to sit comfortably, and so constructed as to swing outwards through a frame in the back wall of the closet over the pan when in use, and inwards so as to expose the pan when not in use. The inward movement causes a flushing of the closet, and the outward the refilling of a cistern. The door of the closet cannot be opened until the box is drawn inward.

## NEW APPLICATIONS FOR PATENTS.

September 8.—14,071, W. Sanday, Hand-planing and Surfacing Apparatus for Wood, &c.  
September 9.—14,139, A. E. and J. Tannahill, Joints or Connections for Pipes, &c.—14,129, E. Willford, Unions or Couplings for Pipes.—14,139, J. Taylor and others,

Fireplaces or Grates.—14,143, P. Koch, Planing-machines.—14,153, J. Macdonald, Ventilating Sash-bars or Astragals.—14,162, J. Bots, Circular Saws.—14,181, J. Sears, Ventilators.—14,188, H. Balbian, Pipe Couplings.—14,201, R. Grimaldi, Moulds for the Production of Solid Designs on Tiles.  
September 10.—14,212, J. Adams, Door-springs.—14,224, E. Osborne, Paved Streets or Roads.—14,226, J. Bullen and E. Cooke, Slating, Lowering, and Balancing.  
September 11.—14,239, F. Smith, Ventilating.—14,294, E. Eden and W. Day, Glaziers' Spring-cutters.—14,309, W. Morrison, Wall Ventilators.—14,312, J. Gibbins, Automatic Door-fastening.—14,325, W. Laycock, Window-lifts and Draught-excluders.—14,328, H. Bonnycastle and T. Rymer Jones, Refractory and Non-conducting Bricks.—14,340, E. Oroyd, Warming and Ventilating Hospital Wards, &c.—14,351, J. Bass, Securing Door-handles to their Spindles.—14,359, L. Fargue, Stained or Ceramic Transparent Glass Windows.—14,362, A. Hogan, Machine for Cutting Laths.  
September 12.—14,388, C. Forell, Manufacturing from Roman Cement a Composition similar to Portland Cement.—14,406, J. Jones, Ventilation of Drains.  
September 13.—14,427, E. McKenna and G. Anderson, Chimney-tops.—14,439, J. and T. Clemenson, Portland Cement.—14,460, E. Edwards, Electric Bells.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

7,342, W. Cox, Ventilators.—11,771, W. Morrison, Door-closing Apparatus.—11,893, S. and J. Filton, Windows.—12,753, E. Urry and G. Farini, Closing of Doors.—13,579, E. Hindle, Drain-pipes.—13,596, G. Farini, Spring-door Hinges.—13,620, A. Cashin, Securing Knobs or Handles to Door-locks, Latches, Door-knob Roses, &c.—13,390, J. Wilson, Stench-traps.—13,438, C. Brook, Carpenters' Squares, &c.—13,476, W. Downing, Weather-bars or Draught Excluders.—13,602, E. Hanworth, Draught and Rain Excluder for Outer Doors of Buildings.—13,625, J. Brailwood and C. Gauntlett, Fireproof Construction of Buildings.—15,647, G. Tunks, Chimney-cowl.

## COMPLETE SPECIFICATIONS ACCEPTED.

## Open to Opposition for Two Months.

14,310, J. Newnam, Registering Mortice Lock.—17,422, F. Podany, Clearing Timber of Sap.—17,768, H. J. Bassett, Building Material for architectural and other purposes.—729, W. Thompson, Sash-locks or Window-fasteners.—8,402, E. Frame and C. Neff, Water-closet Fittings.—8,606, S. Bryan, Treatment of Slag for Building Blocks, &c.—9,010, J. McPhun, Morticing-machine.—10,917, V. and J. Green, Locks for Doors, &c.—11,444, W. Thompson, Spiral Stairway.—11,447, W. Brennan, Seals for Bolts, &c.—12,621, R. Crane, Detecting Leakages in Soil-pipes, &c.

## CONTEMPLATED IMPROVEMENTS AT GOOLE.

An adjourned meeting of the Local Board at Goole on the 9th inst., Mr. H. B. Thorp presiding, an important report of the Surveyor (Mr. E. C. B. Tudor) was taken into consideration. It was in reference to the expenditure of between 3,000l. and 4,000l. in street improvements, &c., which have been rendered necessary by the growth of the town. The consideration of the matter was adjourned to allow of time for a reply from the Local Government Board as to the conditions of a loan for defraying the cost of the improvement.



LONDON.—For erecting gymnasium at the People's Palace, Mile End-road, for the Worshipful Company of Drapers. Mr. Charles Reilly, architect, 23, St. Swithin's Lane, E.C. :—

[Communications for insertion under this heading must reach us *not later than 12 noon on Thursdays.*]

BECKENHAM (Kent).—For the erection of Parish Room, for St. Michael's and All Angels, Beckenham, Kent. Mr. P. Brown, architect, Anerley:—  
Caplen & Redgrave, Croydon\* ..... £732 0 0  
\* Accepted.

CATERHAM.—For erecting four pairs of cottages, for Mr. Walter Smith. Mr. Fredk. Eliff, architect, Caterham Valley.

Ward .....	£1,618	0	0
Waddington & Co., Limited .....	1,600	0	0
Harman .....	1,536	0	0
Scrivener .....	1,321	0	0

CONISTON (Lancs.).—For building billiard-room, conservatory, &c., at Holywath, Coniston, for Mr. Barratt, P. Messrs. Settle & Farmer, architects, Ulverston :—  
Bell & Usher, Coniston (accepted) .. £983 0 0

EDINBURGH.—For erecting parapet wall and railing, paving out, &c., a plot of ground and forming new footpath at Edinburgh, for the Magistrates and Council. Mr. John Cooper, Burgh Engineer, 1, Parliament-square.

William Wilson .....	£285	9	9
P. Bell & Son .....	265	0	0
William Gerard .....	260	0	0
John Lowrie .....	233	0	0
John Petrie & Co. ....	230	0	0
Wm. Cowie & Son .....	205	0	0
James Young & Sons (accepted) ..	205	0	0
John Menzies & Son .....	204	0	0
[All of Edinburgh.]			

LONDON.—For making-up and paving new streets in the Parish of Fulham. Mr. W. Sykes, New Street-Surveyor.

<u>Killingback</u> .....	£1,400	0	0
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Nash .....	1,373	0	0
Greenham .....	1,350	0	0
Neave & Son .....	1,205	0	0
Rogers .....	1,179	0	0
Nowell & Robson .....	1,175	0	0
Tomes & Wimpey .....	1,059	0	0
Mears .....	1,035	0	0

<i>Barons Court-road, Section 3.</i>	
Neave & Son .....	802 0 0

Naah .....	593	0	0
Killingback .....	600	0	0
Rogers .....	575	0	0
Greenham .....	573	0	0
Nowell & Robson .....	527	0	0
Mears .....	515	0	0
Tomes & Wimpey .....	512	0	0

<i>Barons Court-road, Section 4.</i>			
Killingback .....	400	0	0

Neave & Son .....	360	0	0
Rogers .....	360	0	0
Nash .....	353	0	0
Greenham .....	345	0	0
Nowell & Robson .....	335	0	0
Tomes & Wimpey .....	329	0	0
Mears .....	310	0	0

<i>Lillie-road, Section 4.</i>		
Neave & Son .....	483	0 0

Nash .....	459	0	0
Greenham .....	446	0	0
Rogers .....	400	0	0
Nowell & Robson .....	389	0	0
Tomes & Wimpey .....	379	0	0
Killingback .....	330	0	0

<i>Perham-road, Section 2.</i>			
Neave & Son.....	386	0	0
Killingback.....	370	0	0

Rogers .....	376	0	0
Nash .....	343	0	0
Nowell & Robson .....	335	0	0
Greenham .....	320	0	0
Mears .....	300	0	0
Tomes & Wimpey .....	272	0	0

		<i>Lurgan-avenue.</i>	
Nash .....	1,411	0	0
Fillingback .....	3,222	0	0

King's Daughters .....	1,090	0	0
Neave & Son .....	1,012	0	0
Tomes & Wimpey .....	1,005	0	0
Nowell & Robson .....	969	0	0
(Greyhound-road, Section 4.			
Neave & Son .....	176	0	0
Nash .....	160	0	0

Greenham .....	150	0	0
Nowell & Robson .....	132	0	0

Tonnes & Impney .....	129	10	0
Killingback .....	125	0	0
<i>Peterborough-villas.</i>			
Nash .....	225	0	0
Greenham .....	215	0	0
Killingback .....	205	0	0
Boars .....	200	0	0

Nowell & Robson .....	200	0	0
Neave & Son .....	188	0	0

Tomes & Limpey ..... 188 0 0

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LONDON.—For the erection of new warehouse, Dockstreet, E., for Messrs. Thos. Bear & Sons. Mr. E. A. B. Crockett, architect:—

Holland & Hannen.....	£5,015	0	0
Ashby & Horner.....	4,427	0	0

Nightingale .....	4,390	0	0
Jas. Greenwood & Son (accepted) ..	4,382	0	0
Onthwaite .....	4,324	0	0

LONDON.—For alterations to the "Duke of Cambridge," Kilburn. Mr. W. T. Farthing, architect, 46, Strand:—  
G. Godson & Sons, Kilburn (accepted) £386 0 0

LONDON.—For alterations, decorative and sanitary works to house and stables, at 55, Westbourne-terrace, Hyde Park, W. Mr. J. Ems, architect, 151, Ebury-street, S.W. :—  
M. B. Cranstone, 35, Spring-street, Paddington (accepted)..... £700 0 0

LONDON.—For rebuilding No. 63, Moscow-road, Paymaster for the Metropolitan Railway Surplus Lands Committee. Mr. John E. Still, architect, 50, Finsbury-square, E.C. :—  
Langridge..... £820 0 0  
Brower..... 600 0 0  
Castle & Sons..... 475 0 0  
Roffey, Putney..... 455 0 0

LONDON.—For new top story, and contingent works, at 49, Eaton-terrace, S.W. Mr. J. Ems, architect, 151, Ebury-street, S.W. :—  
C. Bowden & Co., 79, Elizabeth-street, Eaton-square (accepted) .. £240 0 0

MARDY (Mon).—For the erection of twenty-eight cottages, at Mardy, Rhondda Fach, Monmouthshire. Mr. Wm. Thomas, architect, Mining Offices, Bryn-Awel, Aberdare :—  
Edward David & Son, Treherbert .. £3,971 0 0

MORTLAKE.—For building cottages, stabling, &c., at the pumping station, Mortlake. Mr. J. C. Mellis, engineer, 235, Gresham House, Old Broad-street, E.C. :—  
Abraham Kellett..... £3,500 0 0  
S. Polden..... 3,237 0 0  
Socle & Son..... 2,750 0 0  
George Wade, Chelsea (accepted) 2,117 0 0  
Alway Bros..... 1,975 0 0

NEWARK (Notts).—For the erection of cellars, cash-sheds, and engine-houses, for Messrs. Warick & Richardson, brewers, Northgate. Mr. George Shepherd, architect. Quantities supplied :—

Wright & Sons.....	£2,878 0 0
Orter & Broughton.....	2,822 0 0
Woodsend.....	2,350 0 0
S. & W. Pattinson.....	2,800 0 0
H. S. & W. Close.....	2,248 0 0
Vickers.....	2,905 0 0
Corham.....	2,200 0 0
Baines.....	2,163 0 0
Smith & Lunn.....	2,105 0 0
Brown & Sons.....	2,102 0 0
Wheatley & Maule.....	2,085 0 0
Mackenzie & Sons, Nottingham* ..	2,080 0 0

\* Accepted.

PAIGNTON.—For the erection of stabling, &c., for Mr. Washington Singer. Mr. W. G. Coudrey, architect :—

J. Mudge.....	£613 4 0
H. Webber.....	565 18 0
C. & R. E. Drew.....	558 0 0
Rabblch & Brown (accepted).....	536 5 0

SOUTHAMPTON.—For alterations and additions to "Windsor Brewery," Southampton, for Messrs. Hine Bros. Mr. W. H. Mitchell, architect, Southampton :—  
Dyer & Sons..... £1,050 0 0  
Jukes, T. J..... 1,089 10 0  
Bull, Sons, & Co..... 1,016 0 0  
H. Stevens & Co..... 899 0 0  
Morgan, Ised, and Morgan..... 978 0 0  
J. Crook & Son, Northam, Southampton (accepted)..... 977 10 0

TOTTENHAM.—For erecting swimming-bath and gymnasium, at the Tottenham High School for Girls. Mr. Charles Kelly, architect, 23, St. Swintha's-lane, E.C. :—

Norton & Son.....	£4,288 0 0
Colls & Son.....	4,230 0 0
Ashby & Horner.....	4,157 0 0
Ashby Bros.....	4,100 0 0
Williams & Son.....	4,077 0 0
W. Downs.....	4,020 0 0
Dove Bros.....	3,945 0 0
S. & J. Gerrard.....	3,839 0 0
John Woodward.....	3,779 0 0
Brown, Son, & Blomfield.....	3,662 0 0
Humphreys & Son.....	3,650 0 0

TOTTENHAM.—For alterations and repairs at the "Enterprise" Club, Tottenham. Mr. John Pinder, architect, Tottenham :—

H. Duffell, Stamford-hill.....	£173 0 0
T. Bruce, Tottenham.....	150 0 0
J. Linzel, Tottenham.....	149 0 0

TOTTENHAM.—For works at the "Duke of Cambridge," West Green, Tottenham. Messrs. Fletcher & Migott, architects :—

Ogden.....	£969 0 0
Voller.....	369 0 0
Collins.....	336 0 0
Salt (accepted).....	329 0 0

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#### TO CORRESPONDENTS.

W & H.—L. R.—H. T. H. O. W. (on space this week).—J. T. M. O. F. H.—C. & Sons, we could not print such a statement except as an extract from a published report of the case before a magistrate. —A. H. B.—P. & F. C. (entirely out of the scope of this paper).—W. D. (amounts should be sent).—C. & Son (one of the lists appeared last week).—J. J. (amount of accepted tender should have been sent). —T. L. (too small in amount).—M. & K. (ditto).—Dalston (no sender's name).—C. F. K.—W. P. B. (next week).  
All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication. We are compelled to decline pointing out books and giving addresses. —Nora.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications. Letters or communications (beyond mere news items) which have been duplicated for other journals, are NOT DESIRED. All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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# The Builder.

Vol. LIX. No. 2487

SATURDAY, OCT. 4, 1890.

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Bullers Wood, Chislehurst.—Mr. Ernest Newton, Architect . . . . . *Single-Page Photo-Litho.*  
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### The Sharqi Architecture of Jaunpūr.



THE finely illustrated volume issued under this title\* forms the first of a new series of reports, begun after the reorganisation of the Archaeological Survey in Upper India in 1885; and if the work is to be continued on the same scale and with the same thoroughness of illustration, we may look to see at last something like an adequate illustration of a considerable portion at least of the immense and multifarious architectural remains of the Indian Peninsula. This volume, with its seventy-four plates, illustrates a small section of this vast object, the architecture of one period of a limited district, which occupies only a chapter of half-a-dozen pages in Fergusson's great work on Indian architecture. According to Dr. Burgess's preface, the former class of archaeological reports consisted "chiefly of cursory notes on places visited on a flying tour, with rough drawings and photographs of the more notable buildings and sculptures met with, and speculations on matters on which the surveyor did not possess the materials for anything better than a mere hypothesis more curious than scientific"; and the result of this hasty though well-intended work has been that while Dr. Burgess had hoped to utilise much of the material in the shape of drawings executed on surveys previous to 1885, it was found that those drawings, though well-executed, were exceedingly inaccurate as to details, which had not been conscientiously measured or drawn with the requisite care, and it was necessary to re-measure and re-draw the whole of the monuments. The object under the new system has been, we are told, to avoid speculative criticism as to history or style, and to make it the main object to give the ascertainable facts correctly in illustration. The illustrative work has been carried out, for

the district under consideration, by Mr. E. W. Smith, in a manner which fully proves his ability and capacity for taking pains. The illustrations have been reproduced at the Survey of India Office in Calcutta, mainly from measured drawings, and in part from photographs, and form a very fine collection of architectural illustrations. Dr. Fuhrer has contributed a short history of the district and of the dynasty of the Mahomedan kings under whom these buildings were carried out.

Anglo-Indian writers are not prone to trouble themselves much about the fact that names and expressions which are familiar to them are as Hebrew to the majority of readers in England; and it is not very easy for the English reader to extract the historical facts from pages bristling with unfamiliar and uncouth-looking words; but we gather that the epithet "Sharqi" applied to the class of monuments treated of here was a kind of dynastic title or affix of the kings who ruled the province, commencing with one Khwāja Jahān, the first independent prince of Jaunpūr, and who received the title of "Malik-as-Sharq," the affix of "Sharq" or "Sharqi" reappearing in connexion with the names of sundry of his successors. The architecture produced under these rulers, therefore, is Sharqi architecture in pretty much the same sense that the architecture produced in England under the four Georges is called Georgian architecture.

A map of the district dealt with would have been a convenient addition to the volume, and we may suggest that this should form a feature in future volumes of the archaeological survey. Jaunpūr is near the centre of the northern portion of the peninsula, about fifty or sixty miles in a north-westerly direction from Benares, and situated on the river Gōmti, a tributary of the Ganges. One of its finest monuments is a grand stone bridge, a view of which, reproduced from a photograph, forms the frontispiece to the volume. This, however, is a later work than the monuments which form the main subject of the volume, having been built in 1564-8, under the rule of Akbar, who made Jaunpūr and Chunar alternately his headquarters, and by the governor appointed under him, Munim Khān; and therefore does not properly come under the subject of Sharqi architecture. There is an interesting story related as to the origin of this bridge, to the effect that Akbar, who

was fond of water excursions, heard one evening a poor woman lamenting that she could not get ferried across; whereupon he took her across, but subsequently remarked to Munim Khān on the advantage of building a bridge there, and spoke rather contemptuously of the former kings for their preference for building mosques rather than such useful works as bridges. There is a trait of the practical-minded soldier about this which rather reminds one of Napoleon. The advice seems to have been acted on with the readiness which might have been expected from a subordinate governor. The bridge has massive piers, and arches of the peculiar pointed shape characteristic of Saracenic architecture, sharply curved at the springing and nearly straight-lined above, and is decorated with four kiosks, two on each of the piers flanking the centre arch.

The masjids, which form the most important architectural remains of Jaunpūr during the period of the Sharqi rulers, present some architectural characteristics peculiar to themselves. The three special peculiarities are the use of a propylon entrance façade with a large dome immediately in the rear of it; the frequent use of outward slope or batter to the walls; and the combination of Saracenic general idea and style with some Hindū details. The most notable point is the propylon façade to the principal entrances, masking or partially masking a dome in the rear of it. The section through the north gateway of the Atala Masjid, of which we give a reduced reproduction from one of the plates in the book (fig. 1), gives an idea of the combination of dome and propylon, and shows the sloping sides and very Egyptian-like character of the latter. The general arrangement of the front elevation is such as we have indicated in the small sketch (fig. 2), consisting, as will be seen, of a square tower on each side with a screen wall under an arch between the two, and connected together by a horizontal cornice at the crown. In some instances, however, the angle towers rise a few feet above the cornice level and thus assert themselves more distinctly as towers, but always retaining the same arrangement below of a more or less ornamental screen-wall between the towers. The section given in fig. 1, however, though it shows the usual relative proportions of dome and propylon, does not represent the arrangement in the case of the principal

\* "The Sharqi Architecture of Jaunpūr": with notes on Zafarabad, Sahet-Mahet and other places in the north-western provinces and Oudh. By A. Fuhrer, h.b., of the Archaeological Survey. With drawings and architectural descriptions by E. W. Smith, architectural assistant. Edited by Jas. Burgess, LL.D., C.I.E., Director-general of the Archaeological Survey of India. London: Thacker, Spink, & Co.; Bombay: Thacker & Co.; London: Trubner & Co., and W. H. Allen & Co. 1889.

dome and centre propylon of the principal façade, as in this case the dome is always jammed close up against the rear of the propylon. If the reader imagines the intermediate portion between the propylon and the dome in fig. 1 removed, the propylon pushed back on to the dome, and the scale enlarged about one-third, it will then represent the proportionate arrangement of the principal dome and propylon in the same building and in others of its class. This rather peculiar and (we may add) very clumsy architectural combination, a large dome with a gate façade immediately against it which almost hides it from view externally, is the occasion of some speculation in the notes on the plates, in spite of what we are told in the preface as to the wholesome regulation forbidding the members of the Archeological Survey to "speculate." As the book is, "like Cerberus, three gentlemen at once," we do not know clearly to which of the three authors we are to credit the passage in question:—

"The special characteristic of the Jaunpūr style is the lofty propylon with sloping walls hiding a single dome, and it would be well to have some idea of the causes which led at this place to the adoption of this plan, so original, so quickly perfected and hardly imitated elsewhere.\* Did we know, as we never can hope to know, which was called forth first, the dome or the propylon, we should be able to guess the object each was to answer. For while the dome is undoubtedly the most imposing covering for a single chamber, it seems, at least when seen from without, to overpower a room whose walls are not proportionately lofty, and it is hard to fancy how the effect of any building could be pleasing

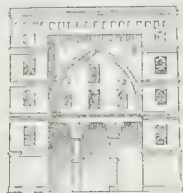


Fig. 2.

when a dome covered the centre of a simple oblong. If, for the sake of an imposing internal roof to a central chamber, the founder wished to build a dome, and if with his desire to utilise material existing in abundance at hand, he was somewhat cramped in his choice of the height of his building, no great ingenuity would be wanted to make him think of proportionally elevating the central portion of his façade, turning his minarets, if he had planned any, into abutments, and filling the intervening arch with a rich screen which should conceal the dome. This seems the true theory. For the idea of the dome must surely have come first. The bold façade standing alone can have been satisfactory only when viewed directly in front; from every other point it would have seemed purposeless, from behind worse than purposeless. Yet, though it had been possible to view it only in the most advantageous way, from the direct front, few would dream of building a façade 75 ft. high and only 55 ft. wide at the base. And so we would claim for the Pāthan architects of Jaunpūr the honour of being the first in India to make domes and their adjuncts an imposing part of a range of buildings."

We have given this passage in full as the critical opinion of one of the producers of the book in regard to a peculiar point in the architecture illustrated; at the same time we think it presents a remarkable confirmation of the wisdom of the Indian Surveys Department in forbidding surveyors to "speculate." The result of this piece of speculation is the discovery of a kind of architectural mare's nest, a new combination in regard to which we only require to know whether the dome or the propylon came first, which, says the writer, "we never can know," though a few lines further down he says that the dome "must surely have come first." If he had considered what the plan has to tell him, he might have spared his con-

\* Kergusson gives a rather different impression: observing, "the peculiarities of this style are by no means confined to the capital. They prevail at Gasepore, and as far north as Canouge, while at Benares the examples are frequent."—*Indian and Eastern Architecture*, p. 235.

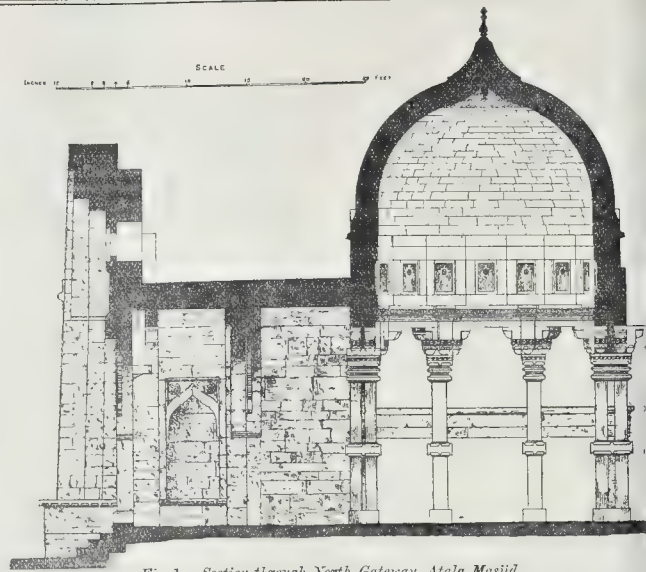


Fig. 1.—Section through North Gateway, Atala Masjid.

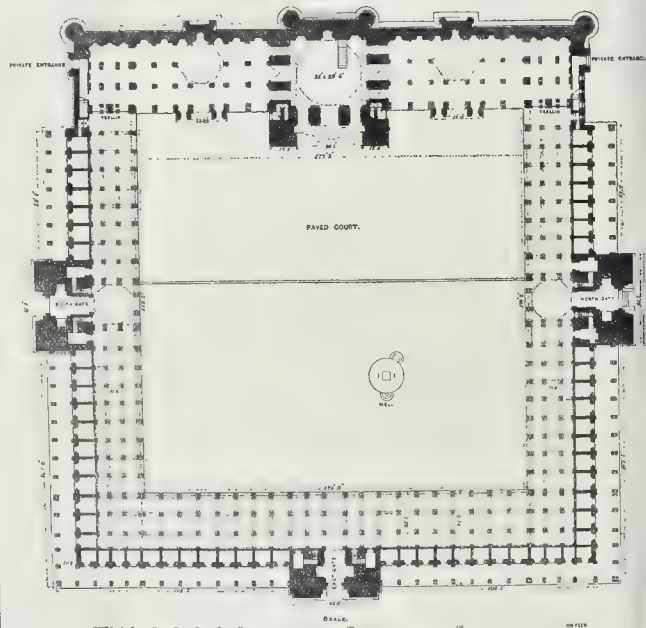


Fig. 3.—Plan of Atala Masjid, Jaunpūr.

jectures, and we should have missed the above-quoted eloquent but hardly convincing passage. True that "few would dream of building a façade 75 ft. high and 55 ft. wide at the base," but the propylon is not a façade in the usual sense, it is a central feature to give dignity to the entrances, a grand gateway in fact. Take the reduced plan of the Atala Masjid (fig. 3); the pylons occur with about the same projection on each façade; where there is no dome, or only a small inner one, opposite the entrance, the dome and propylon do not interfere. On the west side, where it is desired to have a grand central apartment, the dome fills the whole width of the building, and consequently must abut against the propylon. There need be no question of which arose first; the

propylon was the accepted form of gateway; the dome the accepted manner of roofing an important apartment; and when the argument to be domed occupied the whole width of the plan, it had to be got in as best could, crowding up on the propylon. True that in the Jāmi Masjid the small domes are crowded against the propylon well as the larger ones. But this was hundred years later, and only shows that this as in other cases in architectural history a feature first brought about by accident necessity got repeated and adopted by others. But the origin of it was only a "fluke" and two features have no architectural relation to each other, and are merely the result of makeshift. The fine writing about it is therefore all thrown away.



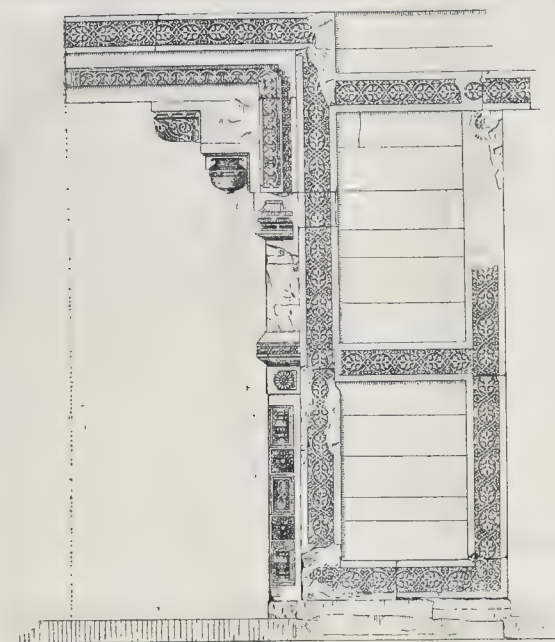


Fig. 4.—Principal doorway, Jami Masjid.

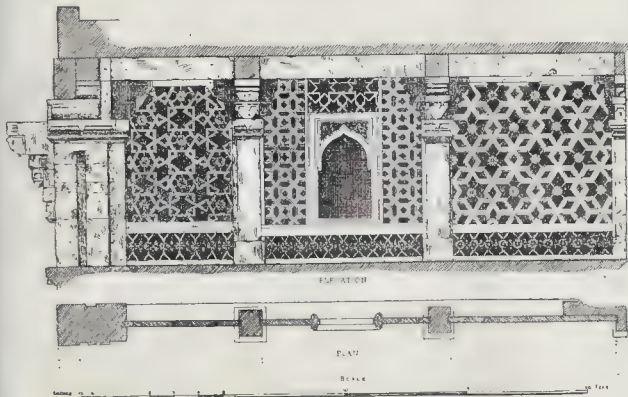


Fig. 5.—Screen-work, Atala Masjid.



Fig. 6.—Masons' Marks, Atala Masjid.

tion on the Lal Darwāza Masjid, "Visadru's son Kamal, the architect," which seems to settle the matter as to that building at any rate, and suggests every probability of the same cause producing the same result in other cases. The doorway of the central entrance to the Mosque, Jami Masjid\* (fig. 4) is a curious mixture of Saracenic general feeling in the enrichments (though with an admixture of floral forms a little at variance with the pure faith) and Hindū detail in the pilasters and brackets. In some places the Saracenic pointed arch is found, foliated with growths of conventionalised lotus flowers; and in the pierced screen from the Atala Masjid (fig. 5) we see the mingling of Saracenic geometrical tracery with the flower-like ornaments beloved by the Hindū artist, especially in the delicate work in the lower range of ornament below the transverse bar. Among the large and interesting collection of masons' marks from Jaunpūr, which fill two plates of the book, we find the same mixture of geometric with more flowing and flower-like designs. We give (fig. 6) a small selection from these. One of them, it will be observed, is a purely natural leaf spray, two others are rude imitations of birds. Neither of these can be supposed to have been used by Saracenic masons.

Nothing perhaps is more striking in this group of buildings than the bold treatment of the outer walls of the Jami Masjid, of which a photograph of one angle is given (plate xlv.). The solid mass of the walls, thickening from the top to the bottom, relieved by occasional lines of delicate surface ornament and a very effective plinth moulding, and strengthened at the angles by the circular turrets also increased in diameter towards the base, combine in a remarkable degree an appearance of fortress-like strength with refined architectural expression. All the details of these buildings, except the diaper or superficial ornament, are however more or less clumsy and barbaric; such details as capitals and columns; and as to mouldings, they do not seem to exist, in our sense of the word; nothing but square sinkings; an infallible mark of architectural incompleteness of style and genius. Among the other buildings illustrated the Lal Darwāza Masjid has considerable interest. It is described as constructed with stone and brick with cement, but principally of stone; externally as well as internally all the walls are of ashlar masonry neatly tooled with fine joints which are so beautifully worked that they hardly exceed a knife-blade in thickness. The writer sarcastically remarks that "churchwardens are the same all the world over," and that the stonework of part of the interior was not long ago treated to a coat of whitewash. He adds another caution which we hope will be attended to in future. Portions of the building, which is in a very dilapidated state, have been repaired, "but in such bad form that one almost wishes such restoration had not been attempted. Such work should clearly be conducted only by officers who have received a special training in architecture." Verily; but how many are there of such in the service? It is curious to observe that in references to this building we are told that "from the evidence of the stones lying about, which have fallen in the lapse of time, it is evident that the stones of this, like all the other masjids of Jaunpūr, had been before used in Hindū or Buddhist buildings." We do not know whether the writer of these words is the same who says elsewhere in the volume that the Hindū element in the buildings is the result of the employment of Hindū workmen who were converts to Mahomedanism; but at any rate the two statements are quite contradictory.

The literary part of the volume, in fact, except the historical sketch, is the least valuable; and in future volumes it would be

\* This, it should be explained, is the building hitherto known to students of architecture as the Jumma Masjid. In five years there will probably be another way of spelling it invented. Even in this book it is given in some places "Jami Masjid" and in others "Jami' Masjid."

The resemblance of the plan of the surrounding colonnades to Hindū architecture, and the fact that no arches are employed, led Fergusson to half suspect at one time that this was a Buddhist monastery, with the domes and gatepieces inserted by the Mahomedan conqueror; an opinion positively entertained by some other less learned theorists. Fergusson was led on consideration to relinquish this idea, and to come to the conclusion that at all events the majority of the trabeated architecture in this and other mosques had been made at the time it was required for the places it now occupies. His suggestion that much of it was executed by Hindū converts to Mahomedanism, who could not shake off their old style and manner of working, receives additional confirmation in the present volume, especially in the inscrip-



better to cut the remarks down to the statement of actual facts, and leave theorising out of the question. But the collection of illustrations is of the highest value, and as we presume that the volume, though an official publication, can be purchased through the London publishers named on the title-page, we may recommend it to the attention of all students of architecture as a book worth possessing, containing some of the best illustrations of Indian architecture that have yet appeared. It is to be hoped that similar volumes, illustrating other branches of the architectural remains of India, will appear in due course.

#### THE NORTHERN EXTENSION OF THE METROPOLITAN RAILWAY.

**T**HE extension of the Metropolitan Railway into the country is an interesting piece of railway enterprise. Speaking generally, the period of railway expansion in England has come to an end. The most important works of the present day consist rather in improvements of existing systems than in new and large enterprises. The Forth Bridge and the Severn Tunnel, for example, are simply, though very important works in themselves, improvements in railway systems which are already in existence. But the expansion of the Metropolitan Railway is not a mere improvement, it is the creation of a new system which will add another northern trunk line to the English railway system. When this new work is completed, it will always be regarded as a signal instance of what can be done by a railway magnate whose diplomatic powers are only equalled by his perseverance. The records of many half-yearly meetings of the Metropolitan Railway Company can be produced to show how Sir Edward Watkin, while in his own mind he had fully matured a large scheme of railway extension, was able to persuade his shareholders that he was only going to construct a few miles of line to the north of London for the purpose of feeding the metropolitan line within the metropolis. Now, however, the northern extension has for some time been opened to Chesham, and steady work is in progress on the portion of the system between Chalfont Junction (where the Chesham branch leaves the main line) and Aylesbury. At Aylesbury the Metropolitan unites with that miserable starveling, the Aylesbury and Buckingham railway. There are also intentions of uniting Oxford and London by this line. At the present time, therefore, it is an interesting trip to drive from Rickmansworth to Aylesbury, to see what manner of country it is through which the new line will pass, and to attempt to estimate the probabilities of the future. We take our start, then, from Rickmansworth, where at present the new line does not appear to have produced any kind of development. This is not surprising, for that little town—if town it can be called—which to George Elliot was a kind of permanent curiosity on account of its many public-houses, is handicapped by its situation. On the one side it is shut in by water-meadows which prevent its expansion, and on the other by Rickmansworth Park. It is equally clear, also, that the train service is not yet sufficiently quick to enable Rickmansworth to be the habitation of the clerk class. An excellent road starts from the Metropolitan station along the western brow of a valley of considerable beauty, through which the river Chess may be seen winding down to join the Colne. For a couple of miles Charleywood Common is skirted, where there is a station in a deep bottom, approached by dangerous roads. A few very good houses border the side of the high road, but, practically, the place is yet free from the builder. It is equally clear, however, that Charleywood has, from a speculative builder's point of view, should property come into the market,—large future possibilities. But, on the other hand, it is equally clear that a considerable sum must be spent on making one

or more roads across the common. We very soon come in sight of Chesham,—which it is well for the tourist, if we may call him so, to rest at awhile. There is not a more picturesque spot in England, and the church contains the chapel of the Russells, where most of that memorable family are buried. It is fortunate that it has had its story told by so great a literary master as Mr. Froude, since no inferior writer will be well advised to attempt to say again what he has told us in his essay on "Chesham and the House of Russell." All that we shall remark here is that the chapel is no longer open as of old to any passing person, and that orders to view the monuments must now be obtained from the Bedford Estate Office in London.

Leaving Chesham, the road presently is crossed by the railway, which is now on our right hand. Chalfont-road station is perceived, and almost a mile beyond the Chesham line branches to the right, and the main line bears away to the left towards Amersham and the Midsbury Valley. It keeps along the eastern side of this valley, the station at Amersham being a little distance from this quiet old place. Amersham has an old-world look. It is not difficult to recall the times when Waller, two centuries ago, represented it in Parliament. It is one of those long, broad streets, with an old gable here and a bit of sober red brick there, which take us back into the end of the last century, into the age of stage-coaches. The fine woodlands which thickly clothe the large parts of the valley heights are much more noticeable here, more especially opposite Sharnolds, where the railway passes on the verge of Pipers Wood, to which Cobbett, in his "Rural Rides," gives a passing word. The scenery is now somewhat marred by the enormous and unsightly embankment, which will carry the line over the grassy dip at the bottom of this wood. But in due time some of the beauty of the place may be regained by judicious planting, though the converging lines of wood and grass cannot be regained. The line begins to approach nearer to the road, and there are already signs up a lane of what some day will be Little Missenden Station. Before Great Missenden is reached, the line crosses the road, and takes the left or eastern side of the valley. It is in reality, however, running here almost in the bottom of the valley; here the line is in quite an elemental stage. Where it crosses the road the pier of the bridge is erected, but the concrete foundations of the other side are only being laid, and the line itself is nothing more than pieces of unjoined embankments. As we proceed along the road opposite to Missenden Abbey there is nothing to be seen of the line; it is lost behind the houses of Great Missenden, a village in character absolutely similar to Amersham, but distinctly less picturesque. Just at the upper end of the village a conspicuous sign-post informs us that we are still nine miles from Aylesbury, and that the road to the left will bring us in three miles to Hampden. About a hundred yards up this latter road the railway is again observed, but up the broad bit of valley beyond its future track is only marked by the wire fencing which indicates the land which will be taken for the purpose of the line. The wooded summits of the Chilterns around Hampden tempt us for a while from the direct route, and we are able, by a visit to Hampden Church and House, to picture to ourselves the country in which the patriot lived and died. It is as quiet and undisturbed a bit of England as can be found throughout the land, and no one who would clothe the dry bones of history with personal and local interest should neglect to visit Hampden's home.

We regain the bifurcation of these roads in due time, and trot onward to Wendover. The imperceptible rise of the valley has now brought us to the verge of the Chilterns, and on either side headlands of smooth grass rise and protrude into the vale beyond. We feel that almost insensibly we have reached the climax of the valley, which begins to rise from Uxbridge, and this is more apparent when the houses of Wendover are perceived

nestled on the hill side below us. The railway will here have to pass through a cutting and as we get beyond the little town this white chalk embankment which will carry it into the vale of Aylesbury pushes its unfinished length into the great vale plain, like a long quay into the sea. It is the last we see of the railway, for we proceed by a gentle and well executed descent more into the valley. A conspicuous house on the right reminds us we are now in the land of Rothschilds, for it is Mr. Alfred de Rothschild's country-house, at Hailton, which stands just on the edge of the plain. If it were clear we should see Waddesdon Manor, in the direction of Bicester and Thame, the chateau of Baron Ferdinand, and most of us have travelled enough on the London and North-Western line to know that the great house of Mentmore lies some ten miles to our right, beyond the wide green pastures, over which the evening haze is hanging.

We have driven some twenty-two miles, and that is sufficient for the day. The county through which we have passed has many charms; it is naturally picturesque, it is as quiet as any part of England, and it has an air of the past about its villages and its secluded homesteads. It is clear that it is a district thoroughly in need of a railway for purposes of convenience,—of that there cannot be a possibility of doubt; but it is equally clear that it is a very naked land from the traffic manager's point of view. By no possibility can it either the passenger or the goods traffic be large, and as soon as the line touches Aylesbury, it enters into competition with the two great systems, the London and North-Western and the Great-Western. It lies between these two; will it bear the squeeze of these two flourishing lines? The North-Western Company has already built a new station at Aylesbury, and will be able, it is obvious, to carry goods to or from Aylesbury at less cost than the new and struggling line. New and struggling it must be, for it is a line which only manages to pay three per cent. on its present capital, and to compete as a long-distance line much capital has yet to be expended. Baker-street Station must be converted into a large and roomy terminus, at a great expenditure of money. The line from Harrow to Baker-street must be doubled also, at a large cost, and considerable masses of new rolling-stock must be procured. Sir Edward Watkin's policy in "getting over" his shareholders was clever, but it may be doubted whether a bolder and franker line would not have really been best for the interests of the Company. To make a trunk line without a terminus must hamper its development for a long time, without any corresponding advantage. The line will be a useful and important one for a part of Buckinghamshire, a very poor agricultural county, but one well suited in the future for residential purposes, not too far from London to become thickly populated. But it requires a sanguine mind to believe in the extension being a financial success, so far, at least, as regards the portion of it from Rickmansworth to Buckingham. A poor but picturesque agricultural county is not likely, in this generation, to feed a new line richly, nor can the fine pastures and hayfields between Aylesbury and Buckingham, served as they will be by these lines, be considered a hopeful district.

**BATH.**—In reference to the Bath School Board competition, several architects of Bath have forwarded a letter to the Bath School Board calling attention to certain conditions which are now recognised in the profession for conducting public competitions. 1st, That the architect whose plan is selected shall be employed to carry out the work at the usual charges. 2nd, That certain premiums shall be offered to two or three at least of the non-successful competitors. 3rd, That a qualified professional assessor be appointed to adjudicate on the plans, and his award to be final. 4th, That the plans not adopted shall be returned to their authors. The letter was considered in a very respectful manner at the School Board meeting, and further procedure in the matter was adjourned for the fuller consideration of the suggestions comprised in the communication.



## NOTES.



**PRACTICAL** demonstration of the process of cremation as applied to the destruction of animal remains was witnessed at the Crematorium at St. John's, Woking, on Saturday afternoon last, by the Association of Public Sanitary Inspectors of Great Britain, on the invitation of Mr. J. C. Swinburne-Hanham, the Honorary Secretary of the Cremation Society of England. About eighty members of the Association were present, and they were accompanied by Sir Spencer Wells, Dr. Richardson, Captain James, Mr. Swinburne-Hanham, Dr. Tripe, Mr. Perry F. Nursey, Mr. Hugh Alexander, and other gentlemen well known in medical, sanitary, and engineering circles. The body of a ram was cremated on this occasion. The weight of the carcase was stated to be about 200 lb., and the time occupied in the operation was an hour and a half,—this being thirty or forty minutes more than are required for the cremation of an adult human body. The explanation of this delay was, firstly, that the carcase of the ram was considerably heavier than the corpse of an average adult; and, secondly, that the process of combustion was considerably retarded by the fact that nearly all of the eighty or ninety visitors availed themselves of the opportunities afforded by the eight or ten "peep-holes" in the sides of the furnace to watch the process of combustion, which was consequently delayed by the influx of cold air at the apertures in question. In the case of the cremation of a human body, this delay could not take place, as it is the regulation that only one person representative of the family of the deceased can be admitted to the cremation-chamber, and, as a rule, only the furnace-man would use the "peep-holes," and only towards the end of the period usually required for the operation, as the representative of the deceased would usually be content with seeing the body deposited in the furnace and waiting until the ashes, in the form chiefly of calcined bone, were withdrawn at the conclusion of the operation. Saturday's demonstration was regarded by all the visitors as completely successful. There was nothing repulsive about it, and no effluvia of any kind were given off. On previous occasions we have sufficiently described the construction of crematoria. The two at Woking are on the Gorini system. We say "the two," because in addition to the one used for the demonstration on Saturday last, the Duke of Bedford has had a crematorium built for himself closely adjoining, and it is possible that a cluster of four, five, or six will ultimately be built,—all of them, it should be mentioned, being served by one chimney-shaft. At the base of the shaft with which the two crematoria are already connected is a purifying muffle-furnace kept at a very high temperature, through which the gases from the furnaces are made to pass so as to eliminate from them all noxious effluvia before they escape into the atmosphere. The buildings at Woking include a funeral chapel, and a waiting-room for mourners. While the cremation of the ram was in progress, a few speeches were made in the chapel, Sir Spencer Wells expressing his regret at the absence of Sir Henry Thompson, the President of the Cremation Society of England. Dr. Richardson and Captain James (Chairman of the Sanitary Committee of the London County Council) both expressed it as their decided opinion that for large towns cremation was becoming every day more and more necessary on sanitary grounds. Captain James especially referred to the dreadfully overcrowded condition of many of the London cemeteries,—some of them now completely surrounded by densely-populated neighbourhoods. Mr. Hanham stated that cremation seemed now to be making rapid progress in popularity. The Crematorium at Woking had been established thirteen years, but, although up to the end of last year only 100 human bodies had been cremated, this year,

so far as it had gone, thirty-eight human bodies had been cremated there; and crematoria were being erected, or were projected, in such important centres of population as Leicester, Glasgow, and Manchester.

**THE** correspondence in the *Times* on the shortcomings of railway companies is still going on, numerous complaints having been lodged; while some of the letters have been of quite a different tenour, and if written in respect of any other business, might have proved invaluable as testimonials. To our mind, however, the most formidable of the many indictments falls into insignificance in the face of a letter which appeared in the *Globe* of the 1st inst. It is dated from the Temple, and the writer states that he travelled from Gloucester by the Great Western Railway on Monday, and that shortly after leaving Swindon it became apparent that something was seriously wrong with the carriage in which he was seated. He thereupon pulled the communication-cord right into the window, but without any result. After jolting along in a most alarming manner for two or three miles, the train was stopped,—but only through the driver of a train going in the opposite direction calling attention to the mishap by whistling,—when it was found that an axle was broken and the carriage was off the metals. The writer examined the cord, and found that on the driver's side a large knot prevented it from passing over the pulley-wheels, while on the other side it had broken! This certainly appears a most scandalous case, and it is quite clear that the communication-cords are often worse than useless. The law is evidently inefficient in simply compelling the companies to provide means of communication, unless it can enforce their being kept in working order.

**THE** practice of the Great Eastern Railway Company of issuing packets of tickets, available for a week, should be followed by all other Companies. But the tickets should not be confined to third class only, and there is no reason why the tickets should be used within a week from the day on which the packet was issued. More especially should this system be taken up by the Underground Railway Companies. A decorator at Kensington may have a piece of work at Bayswater, which will require his attention for a week. It would be a great convenience if he could take a packet of tickets which would enable him to travel backwards and forwards for one week without having daily to take fresh tickets. The issue of such packets at a small reduction is not only a convenience to passengers, it also increases the traffic of the line, and eases the press of work at the booking-offices. The astonishing thing is that this and many other small improvements have not been long ago taken in hand by the Metropolitan and District Companies, who can never compete effectually against the Omnibus Companies unless they attend to many details which are now unheeded.

**I**F the movement against "tied" public-houses becomes general, it is likely to have some important consequences in regard to the value of house property. For it is obvious that if magistrates refuse licences to the tenants of "tied" public-houses, who are notoriously simply the servants of the brewers, it will be necessary for the brewers to put a good deal of house property in the market. It is too soon yet to be able with certainty to assume that the movement will be general, but there is every appearance of its becoming so, and it is certain that the licensing laws intended that the licensee of a public-house should be the responsible tenant of the house. If the property is put in the market, it is clear that a good deal of it will be depreciated in value, and that many new or proposed buildings, which speculators are hoping may be taken up as public-houses, will not find buyers,

as there will be so much public-house property in the market. It is equally clear, also, that as the ordinary licensee can in many cases not take up a public-house from lack of funds, an impetus will be given to the operations of loan companies and similar institutions, who will have to lend the money to the would-be tenant in order to enable him to buy or fit up the house.

**THE** latest number of the American "Journal of Archaeology" (vol. vi., Nos. 1 and 2), has a good article by Mr. George B. Hussey, of the American School of Classical Studies at Athens, on a subject of considerable interest. Everyone knows the custom that prevailed in antiquity of rewarding public benefactors with a crown, and most people are aware that it was also the custom at certain periods to reproduce these crowns on the grave reliefs and on monuments connected with the recipients. No systematic treatise on the subject of these crowns has appeared since Paschalius, of Leyden (A.D. 1625) wrote his pamphlet "de Coronis." Mr. Hussey's monograph is illustrated by two plates, showing the various shapes, positions, and inscriptions of these honorary crowns at different dates. We can only state here his main conclusions:—1. In regard to form, it has been shown that the *pendent* crown only belongs to the better periods of Greek art, the *erect* crown, on stone monuments at least, appears first in the time of Trajan or Hadrian. A peculiar ray-like arrangement of leaves is found to indicate a crown of gold. 2. As regards inscriptions, these consist of one, two, or even three terms, placed regularly in the order of giver, cause of the gift, and recipient. A tendency to enlarge and crowd the letters is noticed in the later reliefs. Instances where some of the terms are found outside the crown belong mostly to the second or first century before our era. 3. In the arrangement of crowns on the monuments two positions—extreme left hand or middle—are found to give special emphasis to the crowns so placed.

**I**N a letter to the *Times* Mr. Poynter draws attention to the slow but sure destruction of the remains of Karnac, owing to the eating away of the bases of the great columns by the mineral salts in the soil. He mentions Marriute Bey's opinion that if left to itself, the entire ruin of the temple must be only a question of time. Surely some efficient measures should be taken, without further delay, towards the preservation of all the remains still left of this wonderful monument of the most ancient known architectural style of the world.

**I**N the present number we publish reproductions of two fine sepia drawings by Mr. A. Graham showing the existing remains of the Roman arch at Timegad in Algeria, and his restoration of the arch based on those remains. The latter drawing, showing the restoration of the arch, was exhibited in the Royal Academy architectural room this year. In commenting upon it, we expressed surprise that a restoration should have been shown without any drawing of the actual remains on which the restoration was based. It appears that Mr. Graham did send such a drawing, which we have the pleasure of publishing this week, but that the wisdom of the Hanging Committee of the Academy rejected it! This is a new example of the utterly careless and incompetent manner in which the hanging of architectural drawings at the Academy appears to be carried out. An R.A. architect is generally *nominal* responsible for the hanging of this class of exhibits: how much does he really see to it? In a French exhibition it would be considered the height of absurdity to hang a restoration of an ancient building without a drawing of the "état actuel," and if we consider what some few of the drawings were like which were hung, the refusal of this necessary complement to the Timegad restoration drawing, in the shape of a really good and artistic drawing of the actual remains, becomes the more absurd.



WE are glad to receive from Mr. Batford, the well-known architectural publisher, an announcement of the appearance shortly of the illustrated work which Mr. J. A. Gotch has for some time had in preparation on "The Architecture of the Renaissance in England." The work will be issued in parts at intervals of two or three months, the first part being promised during the present month. All architectural students will look forward with interest to the appearance of a work on so fascinating a subject, by an architect who combines the artistic with the literary faculty in no ordinary degree. Mr. Gotch is assisted in the work by Mr. W. Talbot Brown, A.R.I.B.A. The book will illustrate such essentially English buildings as Hardwick Hall, Hatfield, Kirby, Burghley, Cobham, Blickling, and many others of lesser note. The larger illustrations will be produced by the phototype process, and will comprise general views of the buildings both exterior and interior, with special features to a larger scale, and the text will be interspersed with about a hundred small sketches of other interesting features, such as balustrades, dormer windows, corbels, bosses, &c.

THE project to commemorate, next year, the hundredth anniversary of John Wesley's death (March 2, 1791), has assumed a definite shape. It is proposed to convert his house, near to the Chapel in the City-road, into a museum of relics and curiosities relating to the history of Methodism, to restore the chapel, repair the burial-ground, and to erect a new monument to Wesley there. Wesley laid the foundation stone of the chapel, on a parcel of ground leased by the Corporation, near Bunhill-fields, in 1777; he occupied the house close by, and was buried in an adjoining vault, which he had prepared for himself and for itinerant preachers who should chance to die in London. In 1740 he, with his own followers, left Whitefield, and the tabernacle in Moorfields, commonly styled as "The Foundry," for this site in what was then known as Royal-row. "The Foundry" has been twice rebuilt since. Amongst other buildings in London that are associated with the career of the founder of the Methodists may be cited the meeting-house at Bromley-by-Bow; Count Zinzendorf's Moravian Chapel in Fetter-lane; Lambeth Chapel, opposite to Bethlehem Hospital; and the Wesleyan Chapel in Justice-walk, Chelsea. He preached in the last two named, upon two successive days, within a fortnight of his death.

WE are informed that special efforts have been made to render the Architectural Association soirée, announced for Friday evening this week at the Westminster Town Hall, superior to any of its predecessors in attractiveness. The large hall was to be converted into a large drawing-room hung with decorations, and the whole of the rooms lighted for the occasion with electric light. It would have been better if this information had been given us at an earlier date, but we hope this mention of it may be seen by a good many of our readers before the time appointed for the entertainment.

THE *English Illustrated Magazine* contains an article by Mr. Austin Dobson on "The Vicar of Wakefield" and its illustrators," a subject of considerable interest. Examples of cuts from various illustrated editions are given, some by names little known at present; one by Bewick, one by Stothard, and some outrageous examples from Rowlandson and Cruikshank, neither of whom were worthy to touch Goldsmith's work as illustrators. As Mr. Dobson does not confine himself to prints published in the book, but includes separate illustrative works, such as Stothard's water-colour at South Kensington, it is odd that he should have omitted all mention of two important paintings, among the best illustrations of scenes in "The Vicar" that have ever been painted, and which were both exhibited at different times in the Burlington House

"Old Masters" Exhibitions. One of these, exhibited a good many years ago, was by Newton, and represented the return of Olivia to her family; we remember calling special attention to it at the time, and suggesting a doubt whether there was any painter of the present generation who could have equalled the pathos and delicate perception of character shown in this work, though many might surpass it in technique. The other painting referred to is by the elder Leslie, the father of the present well-known R.A., and occupied a prominent place in the first room at last year's loan exhibition. It represents the scene which provoked Mr. Burchell's famous monosyllabic criticism, "Fudge!" and in it the various characters of the story are realised with a truth and discrimination which we have rarely seen equalled in an illustrative painting of this class; they are the very people as Goldsmith described them. To omit all mention of this work, so recently exhibited in London, in an article on the illustrators of "The Vicar," is an extraordinary oversight.

THE descriptive notices of buildings illustrated in our pages are, naturally, in most cases furnished by the architects of the buildings, who usually and quite properly add the names of the contractors who carried out the work, but unfortunately in many cases do not take the trouble to be accurate in these details. This complaint arrived at (we hope) its climax last week, when we received letters from contractors engaged on three different buildings illustrated, complaining that their names or those of their firms, or what archaeologists call their *provenance*, had been wrongly given. In the description of Bablake schools, "Messrs. Thomas & Sons" should have been "Thomas Lowe & Sons"; in that of Armagh Cathedral restoration "Mr. Bowater" should have been "Mr. Bowdler," and another contractor "of Belfast" should have been "of Portadown" (in this latter case the contractor's name is so illegibly written both by the architect and the correspondent who writes to correct it that we prefer to leave it out); and in the description of Hatfield "Mr. J. Boulting" should have been "Mr. Thos. Boulting." Now, every one of these mistakes are due to the architects who furnished the descriptions, upon whom we are absolutely dependent for such information. One of them was a case of illegible writing, the others were deliberately and clearly written the wrong way in the architect's "copy." We call the attention of architects to this because mistakes of this kind cause a good deal of annoyance and even injury to the tradesmen whose names are given wrong, and a great deal of trouble to us. An architect must know the correct name of a firm that has been doing work under him; surely he might take the trouble to write it correctly and legibly.

#### LETTER FROM PARIS.

THERE is not much news at this time of the year that is of architectural or artistic interest. Exhibitions are closed, Parliament in vacation, and the public works in progress mostly partake in the general slackness of the period. Among these latter however may be mentioned with approval the new cut that is to be made into one of the densest and ugliest quarters of Paris by the opening of a new section of the Avenue de la République. In a few days will commence the demolition of the houses between Rue Oberkampf and Rue St. Maur, and the stacks of wretched artisans' dwellings will disappear and their inmates be driven to cheaper quarters in the suburbs. When this long avenue is entirely finished, in about eighteen months, it will form an unbroken communication between the Place de la République and the Faubourg Belleville. A rope tramway is also in hand on the same line of road. These improvements will considerably modify a quarter of Paris which stood in much need of improvement.

Among the new works going on in the eastern quarter of Paris is the enlargement of the Gare de Lyon, on which a large sum is being ex-

pended. One feature in this work is the construction of a steel viaduct carried obliquely over the Boulevard de Bercy and which permits of a division of the traffic from the main line, which it will rejoin in the neighbourhood of Villeneuve St. Georges. This will relieve the pressure of traffic and the delays caused by the frequent crowding of trains at this point.

We may mention in passing a very useless and even dangerous piece of work which has been permitted in the Boulevard St. Marcel, an excavation namely, with the object, it is said, of discovering the remains of Mirabeau originally deposited in the Panthéon! It is matter of complaint with the inhabitants of this quarter that the Administration should have permitted this stirring up of ground which is saturated with human remains; a proceeding quite inconsistent with the regulations which the Municipality is endeavouring in other places to enforce in the interests of sanitation. It is with this object that the mortuary dépôts, now nearly completed, in the cemeteries of Père La Chaise and Montmartre, have been carried out, in order to avoid the necessity of keeping bodies, after dissolution, in the crowded houses of the poorer classes. These mortuaries, designed by M. Formigé, are built in a very simple style and partly masked by shrubs and flowerbeds. That at Montmartre will be opened for use on November 1.

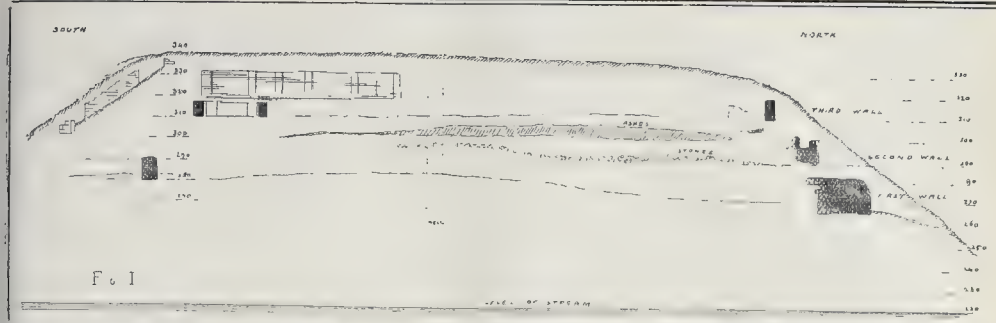
In the same cemetery and at the same time will be inaugurated the graceful monument to the painter Guillaumet, designed by M. Ernest Barrias, sculptor. A model of it in wax was exhibited at the last Salon, under the title "Jeune fille de Bou-Saada." It is now being cast at the foundries. It represents a young African girl seated and throwing flowers on the tomb of the Orientalist painter, whose portrait appears in bronze on a medallion, while the titles of his principal works appear engraved on the granite pedestal along with the simple inscription "Gustave Guillaumet: 1840-1887." The inauguration of the monument to Delacroix is fixed for October 5. The sculptures have been fixed in position and the decorative effect of the whole can now be judged of. The bust of the painter is admirable in truth of expression. It is placed on a pyramid of white marble in front of which is the fine group in bronze, "A cire perdue," of which we have before spoken, and which, like the bust, represents the best of work of M. Dalou. The whole is in the centre of a small hemicycle in marble, in the avenue of plane-trees which runs by the side of the Luxembourg.

Although not a Parisian monument, we may say a word as to that to Garibaldi which is in course of execution by the sculptor, M. Delye, and is to be set up at Nice in June 1891: a monument which has already undergone sundry vicissitudes. It was the subject of a public competition in which Antoine Etex obtained the prize. At the death of this aged artist, the Municipality of Nice, after much hesitation, addressed itself to M. Delye, who found himself embarrassed with numerous difficulties, partly of a political nature, but who has at last completed his model. The statue of the Italian patriot, in white marble, will stand on a stone pedestal, in his well-known and traditional costume which lends itself so well to sculpture: large boots, and mantle flying in the wind; the right hand rests on the hilt of his sword. Before the pedestal is an allegorical group representing France and Italy clasping hands over the cradle of Garibaldi. The whole will be completed by a bas-relief in bronze representing the "Rendezvous des Nations" at Nice.

There is also to be mentioned among recent artistic works a fine medallion portrait which has been put up in the Church of St. Louis, in the Isle of France, of the last curé of that parish, the Abbé Bossuet, great-nephew of the celebrated Catholic orator, and who devoted all his fortune to beautifying his church. The medallion is the work of M. Coutan. It is surmounted with the arms of the Bossuet family and surrounded by a little architectural framework designed by M. Charles Normand. The projected French Exhibition at Moscow is already the object of much preparation. Among the committee of organisation is M. Alphonse M. de Dramard has been named the delegate for the artistic department on the committee.

Various journals have announced that the *Encyclopédie d'Architecture* is about to establish an annual competition which will offer a certain interest and stimulate the originality of young architects. The object of the competition is to





aim at the production of a nineteenth-century style. The result will show whether the idea is any more than simply Utopian. All kinds of designs, from a public building to a shop, will be admitted, and are to be sent in by the fifteenth of November to the office of the *Encyclopédie d'Architecture*. Prizes in money will be given to the designs selected as the best, which will be published in the *Encyclopédie*. A certain number of eminent architects, such as MM. Baillly, de Baudot, Charles Garnier, Lisch, Moynar, Vaudremer, &c., have accepted the office of examiners of the drawings sent in.

The "Société Française des habitations à bon marché" has opened a competition of another and more practical kind, for the best study for artisans' dwellings. This new competition will be closed on November 15.

At the École des Beaux-Arts the candidates for the Juvain d'Atainville prize (historical and landscape painting) have just finished their work. The subject for landscape is a shepherd collecting his flock at sunset; that for history, the decoration of a hall with pictures representing Agriculture and Commerce. The decision on these will be given at the end of the month. The classification of pupils for the competitions of the year is as follows:—"Grande médaille d'émulation," M. Bonis, for painting; M. Miserey, for sculpture; M. Chiffot, for architecture; Abel Blouet prize (architecture), M. Louvet; Jay prize (architecture), M. Tavernier; Jean Leclaire prize (architecture), MM. Chiffot, Jaboulay, and Delussus.

In administrative quarters the question of the admission of women to the course of the École des Beaux-Arts is still under discussion, and is considered to present serious difficulties. Women have already been admitted to the Sorbonne course of study, to that of the École de Droit, and that of the Faculté de Médecine; but it is considered by some that the studies of the École des Beaux-Arts stand on a somewhat different footing in this respect to the more grave and serious studies of the institutions above named. Moreover the students of the École, under pretence of keeping up the classic "Bohemian" traditions, affect too often an exaggerated liberty of speech, dress, and manner, and eccentricities "peu convenables," it is maintained, for feminine association. The Minister of Public Instruction, M. Bourgeois, is said to be in favour of the change, of which Madame Léon Bertaux, president of the "Union des Femmes Peintres et Sculpteurs," is the persevering and eloquent advocate. Nevertheless, there are many who consider that it would be a very questionable expedient, as regards "les convenances," to authorise the joint use by both sexes of the ateliers, as they are at present conducted, and that parents and relations on the ladies' side would probably set their faces against it.

If this is the final conclusion, it would be necessary to establish ateliers for women, in other words to enlarge the establishment altogether, to open new galleries, and proceed in fact to a completely new and costly installation of the whole machinery of the École in duplicate. It would then become a financial question, which the Chambers alone can settle. Nevertheless, M. Bourgeois is so strongly in favour of giving women equal advantages of artistic instruction with men, that in one way or the other it will probably be accomplished.

We have to record the death of one distinguished lady artist, Mlle. Louise Lalande, well known by her contributions to the Salons, and who has died at Paris at the age of fifty-six.

#### MR. FLINDERS PETRIE'S DISCOVERIES IN EGYPT.

LAST week we laid before our readers a notice of the discoveries made by Mr. Petrie in the Holy Land where, for the first time, an effort has been made to penetrate into one of the mysterious mounds so common in the country. In continuation, we are now able to publish a section (Fig. 1) showing the general formation of the "Tel" which, as we then stated, is most probably the site of the ancient stronghold, Lachish. The diagram, by Mr. Petrie's courtesy, is sketched from the measured drawing prepared to a large scale, and which shows the results of the excavations. Since this drawing has been prepared for publication we have ventured in fairness only to anticipate and not to supersede it by the sketch which we now furnish, which is not to scale, and which will not render the more elaborate drawing unnecessary when published.

It shows at a glance the positions of the successive walls, and of various buildings erected one above another.

The lower construction of the two nearest to the south side is that which contains the slabs of limestone with spiral volutes forming the jamb linings of its doorways, of which there



are two in each of three of its quadrangular sides. The long building above it, of a different age, shows us the pilasters already mentioned.

Its axis is different to that of the building below it, and the interval of time between its erection and that of the abandonment of the lower fabric, must have been of sufficient length to allow not only of the gradual raising of the mound, but of its consolidation sufficiently to admit of the erection of the massive structure now found above it. The small amount of earth that has been excavated, and the large amount of work still remaining for the discoverer, is abundantly shown by the little diagram.

We turn to the Egyptian discoveries which Mr. Petrie has accomplished. In treating these briefly and in the second place, as we do, we are in no way unmindful of their importance in relation to the many items of ancient history, ethnology, and artistic beauty which they render. We do so only by reason of the new page of the history of the Holy Land, which the discoveries at Lachish unfold to us, while those in Egypt are the continuation of the researches of last year.

Mr. Petrie has now entirely cleared the whole

area of the town of Kahun, which, it will be remembered, is situated on the borders of the Fayûm, Upper Egypt, and formed, as he supposes, during the XII. Dynasty by a colony of workmen engaged in the erection of the Memorial Temple and Pyramid of Usertesen II., and deserted when the work was completed. The plan prepared during the progress of excavation indicates what was the form of an Egyptian town at the period of remote antiquity stated, according to Bunsen's chronology, about 2500 years B.C. It is in form a parallelogram, the two longest sides facing north and south, and closed within a massive wall, constructed, like the houses, of sun-dried brick. The houses to the north, in the more important part, about upon the town wall, and are divided into parallelograms of varying size. Those to the south about upon a street. Two streets run east and west, connected by another at right angles. Close up to the west wall others perhaps existed, but the site being furrowed by the passage of rain-water, which has washed away a considerable portion, can hardly be accurately examined in this respect.

Adjoining the town on the west is an annexe which appears to have been inhabited entirely by workmen. Judging by the way it joins on to the plan of the other portion of the town, we consider that it is of somewhat later date, an addition to the previous work, and this belief is supported by the fact that its south-west angle touches that of the temple enclosure, thus blocking up the separating space which appears to have been previously opened.

We publish a diagram (Fig. 2), sketched from the town plan, of one of the principal houses, which will give a fair idea of the whole. Here, for the first time, may be seen what was the arrangement of an important household at a period which is anterior to the usually accepted date of the Flood if we accept Bunsen's chronology; or some few centuries later if we accept Wilkinson's. The curious arrangement of the passages leading to various portions of the mansion are, doubtless, intended for the use either of different sexes or of different grades of occupants. The open courtyards, with their pillars for the support of surrounding coverings, are prominent features of the arrangement, and remind us of the similar planning of the Greek and Roman houses of long posterior date. The workmen's houses were approached from various narrow streets running from the eastward up to the western wall of the town, where they stopped, being thus *culs de sac*. They were of small size, crowded close together, and at right-angles to one another.

The enormous mass of work accomplished on this site by Mr. Petrie may be best estimated by his calculation of the various rooms which the whole of the houses were estimated to contain. These amounted to 2,738, of which the large number of 2,145 were cleared out in a most painstaking manner by our explorer's body of workmen, one by one, and the excavated earth carefully examined.

As the earth from one room was removed it was thrown back into another. By this means no accumulation of earth was ever allowed to remain to impede progress, and the work was all the more easily accomplished. The result of the system adopted was the discovery of many curious items of arrangement, as well as of an enormous number of articles of all kinds and descriptions. One of the most curious is that of the common use of the semi-circular arch. Several cellars were found, which, except where out in the rock, were found to have arches formed of two rings of headers. This was not the case in merely isolated examples,

\* "Sculpteuses" would seem more correct.—Ed.



Sketches of Pottery and other objects from  
Mr. Flinders Petrie's Exhibition.

but was found to be of constant occurrence, showing that the builders were perfectly familiar with its use, and thus setting back the period of its invention to some long anterior time. The specimen brick exhibited measures 6½ in., by 3½ in., by 1½ in. thick.

Another of the most curious features met with were the traces of the columns to the open courts, of which fig. 6 is an example, of stone. These stood on the flat, widely-projecting circular bases, so common in later work. They appear to have been mostly of wood, so far as regarded those of largest size. A portion of one, octagonal in plan, still existed *in situ*, the upper part being burnt, while in another place a portion of a carved capital, also of wood, was found, fig. 10. There are, however, many remains of small columns of stone, some of which approach an early form of Doric, having slightly hollow or straight-lined flutes, and square blocks instead of capitals, similar to the so-called Doric pillars of the Beni-Hassan tombs. A great many fragments of small, pedestal-like shafts were found, which prove to be hollowed on top, either for the reception of offerings or for the support of lamps.

Figs. 3, 4, 5, 7, and 8, are typical examples of these curious articles of decoration. No. 5 is a capital of a more ornamented shaft, worked like the others, somewhat irregularly, as if the mason had trusted to his eye for his lines. No. 9 is the base of one of these small shafts, imitated from a structural column of larger dimensions.

This being a town of building artificers, our readers will be interested in the sketches of some of the tools used by the workmen of the remote period under consideration. Flint implements are found in great profusion, side by side with others of copper, the principal being cut flint knives (of which fig. 27 is an example), chisels, and scrapers.

Of the copper tools, figs. 28 and 32 are chisels, circular above, flat at the edge—all fairly examples. Fig. 29 is a borer, and fig. 30, similar to a modern bradawl, is still contained in its wooden handle. Figs. 31 and 33 are copper knives, of which a large number of all sizes were met with; and 34 is an adze, one of which was found tied with thread to bind it to a handle, similar to the flint knife, fig. 27; but in this case the thread was further secured by a seal.

Some of the houses had evidently been decorated in colour, and a portion of wall painting is exhibited. This shows a subdued red ground lined out with two narrow bands of white separating a broader one of fawn colour from a jet black border.

Traces of occupation, later than the twelfth dynasty, were found; and this points to the possibility of the town having had some separate existence from the sanctuary adjoining it, which we think may have been the case, since the area is so much larger than what any mere band of workmen and their overseers would have required. The better portion of the town is, in fact, of much larger area than that specially devoted to the workmen. One of the papyri found, indeed, affords confirmation of the existence of the town at least into the period of the thirteenth dynasty, since we may fairly accept the town named (Kherp Useratesen) as being the Kahun of to-day. It gives a list of the workmen on the wall of the town, the entries being dated, as rendered by Mr. Petrie, the first, second, and sixth years of Sobekhotep I. Our purpose is but to treat of the more architectural and artistic of the relics found, and reference to the beautiful seals, necklaces, and such-like matters, of which there is abundance, may be omitted as being apart from our object. Still, we are bound to mention, as an example of artistic work, an admirably written papyrus, a hymn to Useratesen III., in which all benefits conferred by Deity are ascribed to him. The writing is beautiful and regular, and in fine general condition, notwithstanding its remote antiquity.

The continuance of occupation of the town, however, does not appear to have been general, for at a later period the vaults of some of the houses were found to be used for burial purposes, and, apparently, at varying periods.

Excavations were also carried on again at Gurob, a site which had been previously investigated by Mr. Petrie, a site of more than a thousand years of later date. Here articles of great beauty and of varying races were found, including many works of greater elegance and finish than the earlier ones from Kahun. Here was met with a fine lion's head, evis-



intended to be used as an architectural decoration, an admirable study for a sculptor, since it is worked to be seen from some little distance, and not a single detail is rendered more than was necessary for proper effect. The implements found are of bronze, instead of copper, and some of the articles, particularly the handle of a mirror worked with the Phœnician Venus with a dove, are very admirably designed and executed. A number of vases, as originally manufactured, used in glazing pottery, and to be ground up as paints, were also found. These are deep blue, the beautiful turquoise green, pistoline iron ore, and hematite, ground up to form red paint, and many others.

Beside these is a case, with examples for comparison which have been prepared by Dr. W. J. Russell, F.R.S., in imitation of the ancient colours, made of copper salts, and the resemblance is remarkable.

The pottery from the two sites forms a special feature in the exhibition, and, since the existence of Egyptian pottery as a distinctive class is not been in proof for very many years, the recent collection forms an admirable opportunity for the comparison of very early and later specimens, together with examples of foreign manufacture imported by the Phœnicians. In addition, there are some few specimens called Egean, by Mr. Petrie, of which we illustrate a fragment of curious black ware, fig. 12, the lines of which are filled in with white, similar to examples still made along the borders of the Dead Sea. Another, fig. 13, has white lines on reddish ground, and fig. 16 is a reddish ware, &c.

Of purely Egyptian forms, figs. 11, 14, 15, 17, 8, 19, and 20, may be regarded as typical examples, the first of these being decorated with red and blue lines alternately on a light brown ground. Nos. 21, 22, and 23 are fragments only of moulded and modelled pottery of oval design, all highly glazed and decorated in front with purple, blue, and green, in very effective manner, while the interiors are coloured beautifully with turquoise blue. Fig. 3 has green leaves on a black ground. It is a matter of regret that only small fragments of this remarkable ware have been met with. They come from Gurob, as do also the originals of figs. 24 and 25, two beautiful blue jars decorated with patterns of lotus leaves and flowers.

The green-glazed lamp, fig. 26, also comes from Gurob.

The exhibition will remain open to the public, at Oxford-mansion, until October 11.

## THE COMPETITION FOR THE WORCESTER VICTORIA INSTITUTE.

THE Worcester Victoria Institute is at present housed in a most inconvenient building, and it has been proposed to erect a building, to cost about 20,000*l.*, providing ample accommodation for a free library, an art gallery, and museum, and in connexion therewith technical, science, and art schools. Mr. Waterhouse, R.A., was retained by the committee to act as assessor, and out of the large number of sixty-eight sketch designs the following six firms were selected and invited to prepare designs in more detail. Messrs. J. W. Simpson & E. J. Milner-Allen, Strand, London; Messrs. Smith, Woodhouse, & Willoughby, Manchester; Messrs. Theo. Moore & W. Henry White, London; Messrs. Salter & Adams, London; Messrs. F. C. Ryde & Bedford, Great George-street, London; Messrs. Walter Cook & G. H. Grocock, Cardiff. These six firms will share the sum of 300*l.* in accordance with the conditions, whilst Mr. Waterhouse has awarded the first place to the designs of Messrs. Simpson & Milner-Allen.

The decision of the assessor we can confidently assert will be fully endorsed by all who will take the trouble to carefully examine the designs.

A short description of the site will explain the difficulties that had to be contended with.

The site, which is fairly level and of oblong shape, adjoins the premises of the Shire Hall, is bounded on the west by Foregate-street, on the east by Sansome-walk, and on the south by Taylor's-lane, which is a footpath with a width of 10 ft. The opposite side of Taylor's-lane is occupied by houses and cottages, whose windows dominate the opposite property to a greater or less degree, but with the intention of minimising this restriction it has been decided to widen Taylor's-lane to 20 ft.

In careful and skilful evasion of these re-

strictions of light, Messrs. Simpson & Milner-Allen far surpass their competitors, and to the cleverness of the plan their success is mainly due, for the elevations are kept very plain in character, with a view to keeping the cost within reasonable bounds.

In every case competitors have placed the library block at the Foregate-street end, and the schools block facing Sansome-walk.

Messrs. Simpson and Milner-Allen plan their library entrance at the corner of Foregate-street and Taylor's-lane, leading through a porch kept low on account of the dominating light; from the vestibule opens the news-room, facing Foregate-street, with book-store adjoining. The reference reading-room faces Taylor's-lane, and adjoins the committee-room. The librarian's office is conveniently and centrally placed, adjoining the book-store. A spacious staircase with corridors, overlooking Taylor's-lane, leads from the vestibule to the upper floor, where ladies' and gentlemen's retiring-rooms occupy convenient positions at the head of the stairs. Museum-rooms face Foregate-street, with art-galleries, top-lighted, *en suite*, behind them.

Another staircase, with lift adjacent, is placed in the south-east corner.

The entrance to the schools block has been placed in the centre of the Taylor's-lane frontage, and leads to a corridor parallel to the lane; on either side of entrance ladies' and gentlemen's lavatories have been provided, but these are only carried up to the first floor level to prevent obstruction to the adjoining lights. The lecture theatre faces Sansome-walk, whilst class and other rooms and laboratory occupy the north side of the corridor.

The art school is also conveniently arranged on the first floor. The antique, master's, and modelling rooms all have good north lights, whilst the elementary room has been placed over the lecture theatre, facing Sansome-walk. A good position has been reserved for a conservatory over the entrance, and the south aspect appears to be suitable. Caretaker's rooms occupy a second floor. The basement has been divided between a technical school and the necessary chambers for heating, storage, and other purposes.

The ancient lights of adjoining properties have been most carefully considered and successfully dealt with. There is but one window with which any fault can be found, and that lights the museum and overlooks the Shire Hall Lodge. This will, no doubt, be remedied at an early date.

The remaining designs we must mention in the order in which they hung on the walls.

Messrs. Stephen Salter & Adams, in their design, have placed their entrance to library at the corner of Taylor's-lane and Foregate-street, with news-room facing the latter and the book-store in the north-east corner, the reference reading-rooms facing Taylor's-lane adjoins the committee-room; but the librarian's room should have occupied a much more central and controlling position; the lavatories are hardly placed in an accessible position, as far as the news-room is concerned. The rooms also are badly proportioned in many respects. The schools block is deficient in method of plan in several instances. Placing the ladies' over the gentlemen's lavatories on a mezzanine floor, for instance, is open to objection; and the entrance in the centre of the Taylor's-lane front would have better utilised the long corridors. The ancient lights have not been completely dealt with.

The designs submitted by Messrs. Smith, Woodhouse, & Willoughby show several original features. The elevations show considerable grace in their treatment of necessities of a somewhat municipal character. The cost of the building would, however, prevent the adoption of this design. The school block has been carefully planned, and it is a pity that the library block is not free from its defects.

An entrance is placed in the Foregate-street front with a large vestibule for statuary, which leads by a staircase to the first floor galleries only. The entrance to the library is kept quite distinct and is reached from Taylor's-lane, with news-room on the left and reference reading-room on the north. The position of the librarian's room in the extreme north-west corner behind the book-store facing Foregate-street is an unfortunate one.

The school block has been provided with entrances in Taylor's-lane and Sansome-walk and a corridor running parallel with the lane. The lecture theatre occupies the north side of

this corridor. The art school on the first floor shows the elementary art room facing Sansome-walk, whilst the antique and painting-rooms have north lights.

Sufficient attention does not appear to have been given to the ancient lights on the south side, whilst small windows appear overlooking the Shire Hall Lodge. The elevations have been carefully designed and, with the exception of the elevation to the school facing the Shire Hall, which is plain, bordering upon ugliness, shows fairly satisfactory Renaissance treatment.

Messrs. F. C. Ryde and Bedford's design differs from the others in several respects. A large and massive tower occupies the north-west corner adjoining the Shire Hall Lodge, and the best portion of the centre of the Foregate-street frontage is devoted to vestibule. The news-room is carried along the north side with book-store opposite the entrance. The reference reading-room is placed with the committee-room facing Taylor's-lane.

The proportions of these rooms are unhappy in several instances, and we consider the tower too massive in its proportions for the rest of the design. Any dignity it might possess in execution would be nullified by the presence of the insignificant lodge of the Shire Hall at its base. With this exception the elevations show a great deal of quiet grace. The plans are capable of considerable improvement in many ways.

The designs of Messrs. Theo. Moore and W. H. White are an interesting study. It is a matter of regret that the really artistic treatment of the elevations should have been coupled with several serious defects of plan and inattention to the dominating lights of adjoining property. The expense of this design also disqualifies it at once.

The elevations to Foregate-street and Sansome-walk specially deserve notice. The Foregate-street entrance is at the base of the tower, and leads to vestibule. A large news-room is placed at south-west angle, with book-store and reference reading-room adjoining. The committee-room occupies the north-east corner.

Little attention has been given to ancient lights in Taylor's-lane, and windows have been opened on the north side which clearly infringe upon the right of the Shire Hall property. The authors of this design would have been well repaid for a little more attention to the practical solution of the problems of the design—viz., cost on improved plan, and closer attention to questions of light. The fate which overtakes the design is to be regretted, as far as the elevations are concerned, though it is thoroughly deserved owing to the defects already mentioned.

Want of space prevents us fully noticing the designs of Messrs. Walter Cook & Grocock, of Cardiff.

There is satisfaction in seeing a competition decided in favour of the architects who most closely and satisfactorily carry out the instructions given, and we are satisfied that Worcester is selecting the most practicable and satisfactory of the six designs submitted, and that the award of Mr. Waterhouse is a right and fair one in every way.

## ON THE TECHNICAL EDUCATION OF ARCHITECTS.\*

THE words in which the title of this lecture is expressed imply obviously that there may be various sorts of education. Education may, in fact, be directed towards the attainment of different results; or, in other words, may have different aims. These different aims form, indeed, a part of the subject which must receive some attention at the outset, and must not be lost sight of through the lecture, since it is the difference in the results aimed at which should suggest differences in the means employed.

I do not think any excuse is necessary for selecting to-day a subject very similar to what I have spoken upon before. The circumstances, if we give them a moment's attention, not only suggest but almost prescribe this subject. This year, for the first time, the examinations established by the Institute of Architects will all be held, so that we now first have a practical and complete demonstration of what those best fitted to judge consider should be the aims of adequate technical education for architects. For the first time also a scheme for an educational curriculum, not drawn up theoretically,

\* Being the opening lecture delivered by Professor Roger Smith to the Architectural Classes of the University of London (Session 1890-91) on October 2, 1890.



but with a view to practical use, has been put forward by the students themselves. That this scheme, embodied in the proposals of the Special Committee of the Architectural Association, has not yet been adopted by that body, leaves one to some extent free here to comment on its provisions. Suggestions, if good ones, can still be considered, and may still be serviceable. Later on, when a scheme had been definitely adopted, I for one should consider it wrong to do more from this chair than wish it well, and watch its working with interest, as I should any other definitely-accepted programme.

Education, such as a cultivated professional man requires, may, if we attempt its analysis, be characterised as *Initial, Liberal, Technical, and Practical*; and while each of these four words refers to a distinct aim and, to a great extent, to a different series of studies and a distinct course of training, all four are so intimately mixed up together that we can only partially disentangle them. We may, however, go so far as to say that the aim of the *Initial* is one of immediate utility, namely, to give ordinary elementary and general instruction, and to develop ordinary powers of learning and remembering. The aim of the *Liberal* is to enlarge, expand, and strengthen the mind and enrich its stores of general knowledge and powers of action; that of the *Technical* is to impart such theoretical or scientific knowledge, or to teach such accomplishments as are necessary or desirable for the pursuit of the profession selected. The aim of *Practical* training is to actually teach the practice of that profession.

The initial training may be dismissed very briefly. We all understand what is meant by a plain English education though few of us ever stop to think what an enormous stride the child and the boy take while receiving it. I doubt whether any advance afterwards is so great as that made by the child who, during his first five years, more or less masters language. To emerge from the condition of knowing nothing into a state in which you have mastered a vocabulary of several hundred words, and can remember them, can use them correctly, and can understand them when addressed by others to you, is, I think, an advance greater than is ever made in after-life. Nor is the student, youth, or man ever able again to take such a great step, or to enrich his stock of mental possessions with so valuable an addition as when first he has mastered the art of reading, and instead of being dependent for all information and every idea of every sort upon the individuals he is able to talk with, he is made free of that accumulated store of knowledge, wisdom, fancy, or frolic which is the birthright of every one who can read English.

Though this is happily true, and the general effect of brightening and expanding the powers of a youth's mind, which by degrees follows, is of the utmost importance, it is not the main object aimed at. The scholar in this respect is like a man who while digging his field to get in a crop, finds a buried treasure. His aim was potatoes or turnips, or whatever mere food he had sown, and if he got something more precious it was not any part of the expected crop. He had not sown it. That which we may consider a sufficient initial education for an architect may be found described in the programme of the preliminary examination of the Institute of Architects. You will find no subject introduced there which will not be of direct use to the young architect, and no subject carried further than will undoubtedly be required by him.

He is to write from dictation, and is expected to show a legible handwriting, and to mind his stops and capital letters. He is then expected to write something intended as a test of powers of observation and description, which means, I presume, that he will be asked to describe something which has been or is under his notice. Arithmetic, including the rule-of-three and fractions, two books of Euclid, and a very elementary amount of algebra, the geography of Europe, and the history of England, are also required of him, and either one modern language or Latin, with elementary mechanics and physics. These subjects are taught in any good school, and any examination certificate which shows that a candidate has proved to a competent tribunal that he is fairly well educated, is accepted in lieu of going through the paper, and with reason, as, in all probability, the standard will have been higher if the subjects may have differed a little. Lastly, a certain proficiency in drawing is required. This in an ordinary schoolboy may be looked upon as something of an accomplish-

ment, but as any one would be mad to think of making a youth an architect who does not show that he can draw, this in the present programme is only a strictly utilitarian subject; and, speaking generally, it would be easy to show that each one of the attainments named in the programme is important—I think one may say essential—to the intending student of architecture who wants to make progress.

I turn next,—and turn with pleasure,—to that part of education which I have termed liberal, and the aims of which I have described as being to enlarge, expand, and strengthen the mind, and enrich its stores of general knowledge, and powers of action. "A liberal education" is not so often spoken of,—nor, let me add, so frequently aimed at,—now as once was the case; but there is no adjective that so truly expresses the best aims of this the best sort of training and teaching. Instead of keeping the boy at school as few years as will just suffice to get a minimum of knowledge, to send him to Oxford or Cambridge for three years more,—instead of limiting his subjects to those most likely to make him get on in the world, to include those which will make him an abler, a better informed, and a more cultivated man; to provide him with resources for leisure, sickness, or old age; to make the best of any powers, faculties, or genius with which nature may have endowed him, and to teach him some accomplishments, and take him at least to the threshold of the temple of learning,—this is to educate a youth liberally. Of course, in many cases, this is out of a father's or a guardian's power from pecuniary reasons; in others, I fear, the student himself fails to understand what a priceless advantage is within his reach, and declines the opportunity; or, what is worse, has it and wastes it. But when it is possible, no greater kindness can be shown to a young man, than, to some extent, and in some way (not necessarily by sending him to an university), to give a liberal character to his education.

Two generations back the classics—that is to say, the languages and literature of Greece and Rome—were invariably the subjects studied by all who were desirous of becoming cultured men, with, in many cases, the addition of pure mathematics.

There can be no doubt that Greek and Latin, well mastered, have produced, as a rule, a remarkable effect upon the mental powers of the student, and if carried far enough to enable him to acquaint himself with the unrivalled literature in those languages, especially that of Greece, they have proved invaluable as educational instruments; and the same, in another way, has been the case with mathematics.

At the present day other studies run the classics hard, so to speak, and are advocated as equally valuable mental discipline, and as more useful in after-life. I am, fortunately, not required to embark on this sea of educational controversy, as the hearers, and most of the readers, of this lecture have passed the time when it is decided how far a man's scholastic education is to go, and on what lines it is to run. Only let me heartily congratulate any who have had the good fortune to receive a classical education, on the circumstance, one which ought to exert a beneficial influence on their whole career. And it may not be amiss to ask why this should be the case.

The study of language is really the study of thought,—words embody thoughts. Grammar consists in the orderly arrangement of thoughts. Literature is a record including the most cultivated, powerful, valuable thoughts of the world. Hence, in studying language you are indirectly studying thought,—learning to think, learning how others think; in studying literature you learn how others have thought. But why a dead language? There are several reasons; but the chief one, no doubt, is that the study, to yield its best fruit, must be more thorough than it can be where the language is spoken, and the learner acquires many phrases, modes of expression, and a host of words in a more or less loose colloquial manner.

I should, however, be the last to assert that the study of the classic tongues is always carried on an improving study. If only drudgery. If carried out in the perfunctory spirit which just studies the authors set down for matriculation or B.A., as the case may be, and deems every hour not spent in coaching for an examination sheer waste, that, forsooth, is not a liberal study, or likely to improve the mind.

On the other hand, any study worth calling by the name, given to the acquisition of any important art, science, or literature, if carried on in a liberal spirit and directed to the aim I have pointed out, is improving to the mind,—is *typo facto* part of a liberal education. It is doubtful how far either art or science, if directed solely to some immediate profit, can bear this character in its effect on the learner. To be really liberal, study must be pursued partly, at least, for its own sake, with a desire to make a knowledge of, or skill in, some subject thorough and complete.

Science is largely now substituted for literature as a subject of study in places of higher education, and, perhaps, rightly, for this is the age of science, and the qualities and temper of mind fostered by scientific study are greatly needed now.

Fine art, though a branch of an architect's technical education, is really what may be called a liberal subject, and I urge you all to pursue it in a liberal spirit. Give attention not solely to architecture, but to the allied arts of painting and sculpture, and to the allied science of archaeology. Study architecture in foreign travel as well as by stay-at-home work. Try to understand the principles of decoration and of applied art; visit and carefully examine good picture-galleries, and widen and deepen your knowledge of the arts as a whole, by every means in your power.

No young man whose actual schooling or college course is over, and who is occupied,—perhaps busily occupied,—in learning his profession, or earning his living, ought to consider that his education, with the exception of professional study, is over. He ought to carry it on for years to come the best way he can. If I am asked how, I would suggest first of all by keeping up, and, if possible, extending what he has got. If you have learned a language, for example, such as Latin, German, French, or Italian, do not let it drop. If you have mastered the rudiments of a science, try to carry it further, and certainly (as already suggested) do your utmost to extend your knowledge of fine art.

One, and that a very accessible and interesting method of cultivating the mind, is the pursuit of English literature. Our best authors' prose and verse, fiction and fact, provide a literature of the greatest possible value, and if there is nothing else that you do for the next few years by way of mental culture apart from all other and more necessary work, at least I pray you to make yourselves acquainted with the writings of Spenser, Chaucer, Shakespeare, Pope, Milton, and Tennyson, and of Goldsmith, Addison, Johnson, Swift, Macanlay, Carlyle, Scott, George Eliot, and Thackeray, and in some cases not merely read, but re-read, study, and analyse them.

Technical and practical education, though now to some extent separated, could till lately hardly be thought of as two separate things,—at any rate in our own case, or indeed in the case of several other professions. The apprentice learned practice as he still learns it, by working in it, and if he gained theoretical knowledge, he obtained it at the same time, and as he best could,—partly, I may say, since this class was instituted, in this class-room. Now in all professions an effort is being made to impart technical training of some sort by a machinery created for the purpose. Perhaps it will clear the way for the topics which I chiefly desire to dwell on if the two other observations that ought to be made about practical professional education are made at this first stage, before rather than after we reach the technical.

For no profession is a theoretical or collegiate education, however complete by itself, an adequate preparation. Probably at the present day no system of professional education is so complete as the medical, and apprenticeship is there done away with. But the reason is, that in the hospitals, and outside them, a vast field of practical experience under the most eminent examples and teachers is open to the student, and he, for much of his long and arduous period of studentship, is labouring night and day in the wards of the hospital where he is studying, or among the poor in their own houses in the province which the hospital serves, or at the out-patients' department. Meantime, every sort of disease, and every sort of surgical case, is being so treated by the first men of the day under his notice, that the student not only knows and sees all that is done, but learns the reason why, and, as a dresser or a clinical clerk, and later in higher appointments, takes as



active part in the work as the progress he has made renders possible. For few professions, again, has a scheme of thorough instruction been so completely elaborated as for mechanical engineers in this college, lately under Professor Kennedy, and now Professor Beare. Yet let a student go through this whole scientific course, take his degree, and master all that can be taught in this or any college, and the first thing his friends find is that he must now be articled to an engineer for about two years to work in the pattern-shops, the fitting-shops, the forge, and so forth, wearing the dress and doing the work of a mechanic. The same thing is true of any practical profession. The practice can only be learnt by practice.

As a result, I think it is not likely that the practice of apprenticeship, or, to give a more dignified name, pupillage, will cease in our profession. This was hardly my belief years ago, but the more I have seen and experienced of what can and what cannot be learnt under class instruction and under pupillage respectively (and I have had more opportunity than most of comparing the two), the more I am convinced that neither can dispense with the other. True, it is quite possible that changes in form may take place. A radical change did take place when for the old apprenticeship for seven years was substituted the now customary short term of three years, and this alteration, made as it was without the necessary and corresponding provision of means to supplement this brief period by some course of preliminary or concurrent systematic study, has flooded the profession with young practitioners, not a few of whom are, to put it bluntly, lamentably ignorant.

What ought *now* to become customary, and I hope will be, for any young man who is to be an architect, to take a well-arranged course of preliminary technical instruction extending over one year at least, and, when practicable, over two, and then to begin his three years as a pupil, continuing part of his theoretical studies in his evenings, and doing the practical work in the day. And I propose, in considering the technical education of an architect, to try to point out what kind of course such a student should take up, and incidentally to show what facilities this college presents for such a course.

Coming now to a closer examination of the technical education of architects, some of us may feel that the phrase "technical education" has been used again and again without any attempt to define, or even to comprehend, what is meant. Of this phrase, now on every one's lips, I have never seen a definition attempted, and I confess to feeling not a little difficulty in suggesting one. It might at first sight be thought that "teaching an art" corresponded very closely to the sense of the words, but this is not quite what is meant at the present day, and probably "training for an art" more nearly expresses what is done in those noble institutions where those who are to pursue useful arts are receiving instruction, directed partly to teaching them to understand what they will have to do, and partly to develop such skill, manual or mental, and imparting such knowledge as shall help in the acquisition of practical power. What goes beyond this—like the medical curriculum to which I have alluded—is called, and properly called, practical professional education. As the popular technical education movement for artisans is understood and carried out, it is not to be supposed that the institution will educate pupils into skilled artisans ready to work, but that it will supply them with such theoretical knowledge, and possibly develop in them manual skill in such work, for example, as mechanical drawing, as will enable them to become better artisans than they otherwise could be.

So with architects. The technical education of architects has special reference to their instruction in the science and in the theory of this profession and their training in the skilled arts, such as draughtsmanship, which it is requisite for them to possess.

A statement of what this technical education for members of our profession must consist of, is to be looked for, if anywhere, in the programme of the intermediate and the first examinations established for the Institute of Architects.

The candidate in the intermediate examination is required to do as preliminary work a considerable amount of drawing, and this will of course be looked upon by the examiners, first, from the point of view of draughtsmanship, and then, if sufficiently well drawn, scruti-

nisied to see what evidence it gives of familiarity with the general forms, the details and the ornaments of the orders and of English Gothic architecture, and to some extent with what is known about the buildings from which the examples are taken; and, further, in respect of construction, to see whether it gives evidence of some acquaintance with carpentry and joinery. The written and oral examination on art subjects is to take the same range as the drawings cover. That on construction includes the nature and employment of all the ordinary building materials, the calculations usually made in connexion with the stability of buildings and the principles of construction, and a moderate amount of applied mathematics and physics. This examination it is expected that a student can pass in the course of his pupillage. When his studies have been carried so far with the addition of practical work that he is presumed to be fit for admission to the Institute as an Associate, the programme of the final examinations requires evidence of a good general knowledge of architectural history and an acquaintance with the mouldings and features of the various styles, and of a thorough acquaintance with these in the use of some one style; and it also requires the candidate satisfactorily to prepare a design for a building. The scientific subjects may be summarised as nearly the same as in the intermediate, with some omissions and some additions, that is to say, materials, construction, and the calculations necessary for ascertaining the strength of materials and structures, but with the addition of sanitary science, and the omission of applied physics and mathematics. Of course, however, the student would be expected to know more about the subjects which appear twice in the final examination than in the second, subjects that may be considered as belonging specially to practice, including specifications, estimating, and, to some extent, professional practice, and dealing with unsafe buildings, though, of course, on the one hand, much of the construction and of the preparation of a design require practical skill as well as theoretical knowledge; and, on the other, professional practice itself is a very suitable subject for class instruction.

This statement is necessarily made in very general terms, and, in some cases, a single word in it, as, for example, construction or drawing, covers a very large and varied range of subjects, though all closely connected together. Still, we are now in a position—putting the three programmes together—to say that the education of the architect ought, in order to conform to the Institute minimum, to include, at least, drawing, elementary mathematics, and physics, and their application to construction. The history and the actual forms, features, and details of architecture, materials and construction, and sanitation, together with reasonable skill in designing and in preparing working drawings and specifications, and in estimates. Professional practice and dealing with dangerous structures are also required.

It is difficult to separate the whole course of the architectural development of the young practitioners into two halves and say this portion is practical and that is technical. What is learned in the class-room must be corrected on the scaffold, and, on the other hand, what is learned in the office must be elucidated in the class-room. But it is at least possible to point out what parts of this complex whole a college may with advantage propose to supply, and if we do as much as this we shall have carried the subject as far as in a single lecture it can be possible to advance it.

The Committee of the Architectural Association, taking these very examination-schedules as the acknowledged guides, have prepared a suggested programme of technical education for architects, to be carried out entirely by means of evening work, and entirely by classes and lectures to be established by the Association, and this, which must be familiar to you, now claims our attention.

It appears to me very doubtful whether the technical part of this programme can be thoroughly and efficiently carried out by evening work alone; and though, of course, the conditions under which the Association works entirely preclude their Committee's shaping its programme otherwise, there can be little doubt that this is a weak point in the proposals contained in the report.

Again, there can be very little doubt that an Institution like the Association, if it is to become the Architectural College for the

Metropolis, must ultimately be prepared to give instruction in all the subjects of study in this programme. But at the outset it appears to be an arduous task for it to collect competent instructors and to start classes in all the branches which are enumerated. There is not the smallest doubt that arrangements could be made to utilise existing Institutions, as, for example, this college for the Association students, so that they might take up some of these subjects under existing teachers, while others might be from the first taken at Conduit-street.

It happens to be the intention to go over all the subjects of the Institute's intermediate examination in the first two years of attendance, and those of the final one in the second two years. Students of the first two years standing are to attend classes or studio three evenings a week for three hours each evening, and those of third and fourth years' standing are to attend three evenings one week and four the other. All students would on one evening have two consecutive lectures or classes of one and a half hours each, which seems to put a strain upon them, and once a fortnight the third years' students are to have two such evenings. This, if the scheme is carried out, may, I hope, be considered open to revision; an hour and a half is too long a period for a lecture, though it may not be for a class, and the advantage of two such attendances immediately succeeding each other appears to me very doubtful.

Rightly, perhaps, the Report lays stress upon the fact that the Institute programme does not comprise all that a student of architecture ought to study, but it may be open to doubt whether the subjects outside that programme do not serve to overweight the course, already very arduous, set before the students in the curriculum.

And it seems open to question whether all these should not be more distinctly set aside as *extra subjects*, both as to position in the programme of education and as to their place in the distribution of time. If, for example, the alternate Fridays on which the Association does not hold its ordinary meeting were, throughout the four years for which the course lasts, devoted to lectures and meetings of classes on the extra subjects, there would be as many evenings given to them as are now proposed (studio work excepted), and they would be more distinctly set apart than they are. I am quite aware that considerations can be urged against this proposal, but being thoroughly convinced that the programme as it is is too full, I throw this out as a suggestion, for what it may be worth, as a way to lighten it without entirely removing any subject from the list.

Having now indulged in some criticism, let me turn to the more pleasant task of pointing out that this curriculum is in many ways an admirable statement of the subjects which students ought to become familiar with; that it has arranged them very intelligently, and stated them with much clearness, and that it forms a very good statement of what may be definitely included under technical education for architects. I need not add that it must be supplemented by practical education. It is in its very nature a programme drawn up for the use of students who are every day and all day long practically engaged in professional work, and to such men, if they are resolute enough and in the enjoyment of sufficient vigour and sufficiently good health, to work with a will through the number of hours devoted to study, it offers many advantages.

Of course, the actual success of this or any effort depends mainly on personal considerations—the resolution and abilities of the students; the aptitude and attainments of the teachers; and I know that those who drew out this scheme have not been unmindful of the fact that young men have only a certain amount of learning power left after a day's work,—properly done,—and of that other fact that men of cultivation who are apt to teach and willing to accept what must necessarily be a modest remuneration for teaching are not very easy to find. One other sort of person will, I think, also be required, though no hint of him or his office is included in the report, and that is a kind of general superintending and advising head, who shall be able to give counsel, direction, sympathy, and encouragement to all the students, and to all the instructors.

With very sincere good wishes for the prosperity of this new departure at the Archi-



teetural Association when it actually, after due discussion, gets into working trim, I pass on to consider what those can do who are rather differently circumstanced.

In a very considerable number of cases the men who propose to become architects are in sufficiently easy circumstances, or are fortunate in having friends able and willing to allow them sufficient time and to do for them whatever may be best to procure them an education that will fit them for the higher walks of their proposed career, and incidentally for passing the examinations, with a notice of which this paper opened. Such men, coming either from a good school or from college, are particularly well prepared to benefit by work in a collegiate institution like the one within whose walls we are met; and if they can have one session, or in some cases two, at University College, London, and can occupy their time in receiving technical education here, they will no doubt be far better fitted for taking advantage of the professional training that will follow than they could otherwise be.

We know the subjects. Let us see how a man with a year to devote to them might here take them up. Generally, I should like to say, the student in any classes which he attends here will find the Professors to be men who have been carefully selected as men of high standing and reputation, well acquainted with their subjects, in many cases highly distinguished in them, and in not a few cases, also, their fellow-students will be the men from among whom the eminent practical workers of the next generation will rise, men who come here from institutions where they have had an excellent preliminary training, bringing with them habits of study and good elementary information, and whom it is a great advantage to have as fellow-students. Nor are the fine library and the general organization of the whole place for purposes of study to be overlooked. They form, in fact, elements of great value in estimating the use of such a College as this to the students who frequent it.

The subjects which students with a year at their disposal ought to take up will vary with the progress they have already made, but Elementary Mathematics and Applied Mathematics and Mechanics (especially the graphical methods of calculation), will in almost every case be subjects which should be carried further than ordinary teaching takes them, and the junior course in each of these subjects, as conducted by Professor Hill and Professor Karl Pearson, should, generally speaking, be attended, including in this Professor Pearson's Drawing Class. I have very little doubt, however, that in not a few cases the student may come so modestly equipped with mathematical training, that the lower junior class—which takes up arithmetic, algebra, and geometry, and covers the subjects of the Matriculation Examination of the University of London—will be the one which they should attend. These would cover Mensuration.

Elementary Physics are the subject of a separate course; and land surveying and levelling form the subject of a course of practical instruction given by Professor Vernon Harcourt. This amount of instruction would supply the mathematical knowledge required for passing either of the examinations, and desirable in actual practice.

Sanitary Science, a subject essential for practice and for examination, is taught here by Dr. Corfield, the Professor of Hygiene, a man who deservedly holds a high position as an authority on this subject. It is manifestly wrong that a man whose profession it is to design and erect houses, schools, hospitals, and all other sorts of places where men and women are to reside and work, should be in any respect deficient in acquaintance with the laws of health, and the plans to be followed and the precautions to be observed in rendering buildings safe and salubrious, and in correcting defects in old buildings. The very existence of the distinct profession of a sanitary engineer, is something of a reproach to the architectural profession.

Elementary Chemistry and Geology are subjects intimately connected with the architect's work, and for the study of which in this College provision is well made. These are not set down as examination subjects at the Institute, but they are most desirable to know, and, of course, whenever the honours examination is instituted, they will form some at any rate of the subjects of examination.\*

\* We will give the conclusion of this paper next week.

## Illustrations.

### A TRIUMPHAL ARCH AT TIMEGAD, ALGERIA.

HERE are few spots in Algeria which possess a greater interest to the architect, than the site of the Roman city of Thamugas, better known by its modern name of Timegad. Of its history, like other cities and towns in this great Roman colony, we have but little knowledge, except what can be gathered from the numerous inscribed stones that lie scattered in every direction over a large area of ground. In the Itinerary of Antonine it is called Tamugada, and Ptolemy, the geographer, speaks of it as Thamutuda. In later times it is mentioned as Thamugas, and as it became in the fourth century the seat of a religious agitation the names of several bishops of Thamugas frequently appear in early Christian writings. When Solomon, the Byzantine general, arrived at the gates in 535 he found the city in ruins, so we may assume that, with the fall of the Roman Empire, Thamugas shared the fate of other towns in North Africa, and became a prey to the horde of Vandals who swept across the country early in the fifth century, carrying nothing but fire and destruction, and leaving behind them blackened masses of stone and brick. The ruins cover a large surface of undulating ground, forming the lower northern slopes of the Aurès range, and, owing to the excellence of the building materials, and the use of a good deal of hard blue limestone as well as of marble, decay is little noticeable in many of the overthrown blocks and votive monuments. The Forum, which was partly unearthed a few years ago, still retains its original paving, and the bases of the shafts forming the internal and external colonnades are many of them undisturbed. The Theatre, now buried in 16 ft. of earth, the walls of the Basilica, the overthrown Temple of the time of Vespasian, dedicated to Jupiter Capitolinus, and of gigantic proportions, are sufficient to give an idea of the rich field for research still awaiting the spade of the explorer.

The most important of the monumental remains is a triumphal arch occupying a prominent position on the north-west side of the town, and visible from the plain below at a distance of several miles. Its present ruined condition is apparently due to an earthquake, evidenced by the position of some of the blocks in the upper part of the structure. The attic, with the dedicatory inscription, has been overthrown, but several fragments restored by M. Leon Renier leave no room for doubt that the arch was dedicated to Trajan by the 3rd Augustan legion, whose headquarters were at Lambæsis, some twelve miles distant from Thamugas in a westerly direction. The mass of the structure is of sandstone, but the columns and all the decorative features are entirely of white marble, and there are indications of the attic having been faced with slabs of the same material. The drawing, which is here reproduced, was made on the south-west side, to avoid the glare of the sun when sitting in an opposite direction; but, by comparing it with a sketch by Bruce in 1765,\* it will be seen that the eastern side is in far better preservation, and the main features of the composition are more easily studied. The podium of the monument is almost buried in sand, but a few apertures between the fallen masses reveal not only the base of the structure, but parts of the original paved roadway. The arch itself, as shown in the restoration here given, had the usual features common to similar memorials that recorded the beneficence of an Emperor, or marked the victories of a great people. Exception may be taken to the broken pediments as a debased feature in classic composition, but it must be admitted that picturesqueness is gained by the use of this doubtful expedient. The subsidiary columns, resting on corbels, which flank the two side recesses, are unusual, and are certainly pleasing to the eye. This arrangement imparts a richness to the monument, which in other respects is devoid of ornamentation. It should be mentioned that the volutes of two of the capitals of the principal order are in the form of eagles. The colonnade in the distance, shown on the drawing, is that of the forum already referred to. Portions of the wall, forming the

\* Travels in the Footsteps of Bruce in Algeria and Tunis. By Sir R. Lambert Playfair. C. Kegan Paul & Co., London, 1877.

fronts of a series of shops, are still standing. The bases of the shafts are undisturbed as well as of the piers and columns of the central gateway.

Thamugas of the Romans must have been a pleasant city to dwell in. The configuration of the surrounding country had many charms. The hills, now rugged and bare, were then clothed with timber. The great plain that stretched far and wide in front of the city, now treeless and unpeopled, was then a garden of productiveness and dotted with the farmsteads and villas of successful colonists. The surface of the soil, now scratched here and there with rude implements of husbandry, was then tended and irrigated, and, owing to its wondrous fertility, helped to fill the granaries and storehouses of Rome. It is piteous to observe so fair a land converted into a desert, and to mark the lamentable results of long centuries of ignorance, neglect, and misrule.

"Strange—that where Nature loved to trace,  
As if for gods, a dwelling-place,  
There man, enamour'd of distress,  
Should mar it into wilderness."

ALEX. GRAHAM, F.S.A.

### HOGHTON TOWER, LANCASHIRE.

AMONGST the many historic halls of Lancashire, Houghton Tower undoubtedly takes first rank; indeed, with the exception of Haddon Hall, which it somewhat resembles, there are few Elizabethan halls in the country that can compare with it for picturesqueness. Standing on the top of a well-wooded hill, it forms a conspicuous object from the valleys of the Ribble and Darwen. It is built in the form of double courtyards, the outer one being divided by a raised terrace approached by a flight of semi-circular steps; the inner one, which forms the subject of the sketch, has within recent years been made into a garden with excellent effect. The life-size statue of William III. in the centre is of lead, and was brought from the neighbouring hall of Walton-le-Dale, pulled down in 1834.

After becoming dilapidated, and being abandoned as a residence, Houghton Tower has been judiciously restored under the superintendence of Messrs. Paley & Austin, and is now the residence of Sir Charles de Houghton, Bart.

Houghton Tower is the scene of incidents depicted in Harrison Ainsworth's "Lancashire Witches," and it was here that King James I. is said to have knighted the loin of beef.

The following quaint description is by a local historian, Dr. Kuerden, who wrote about 1650. He says:—

"This tower was built in Queen Elizabeth's reign by one Thos. Houghton, who translated this manor-house, formerly placed below the hill near unto the water side. Betwixt the inward square court and the 2d, was a very tall strong tower or gate-house, which in the late and unhappy Civil Wars was accidentally blown up with powder, and some adjacent buildings, after the surrender thereof, and one Captain Skirky with 200 soldiers were killed in that blast most woefully. The outward is defended with two lesser bastions upon the south-west and north-west corners, besides another placed in the midst betwixt them, now serving for an outward gate-house. The stately fabric is incircled with a most spacious park, which in former time was so full of timber that a man passing through it could scarce have seen the sun shine at middle of day; but of later days most of it has been destroyed. It was much replenished with wild beasts, as with boars and bulls of a white and spangled colour, and red deer in plenty; the last as yet preserved for game by the lords thereof."

The drawing by Mr. J. Langham, from which the view is taken, was exhibited at this year's Royal Academy.

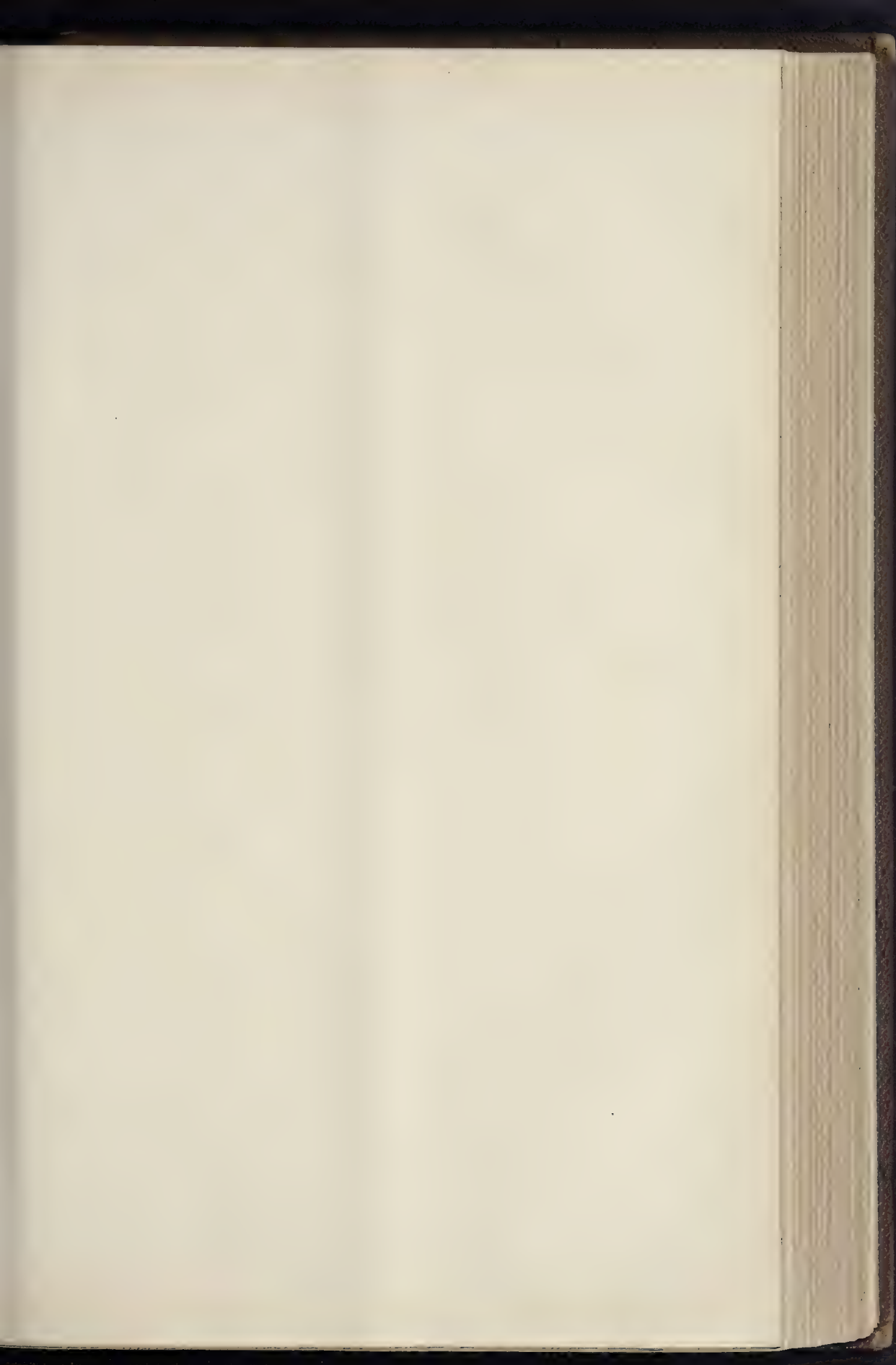
### BULLERS WOOD, CHISLEHURST.

This house is an old one remodelled entirely. The old house was a fair sized villa, built about thirty years ago. The outside was "Italian," with a uniform covering of grey stucco, relieved by bands, bays, quoins, strings, &c., of painted cement. The roof was of very flat pitch, and covered with blue slates; it was also much cut up.

Where the old walls have been left they have been faced with red brick. The hall, staircase, library, and drawing-room are new, and a new tiled roof and wooden cornice has replaced the old. The new rooms are panelled, and have pattern ceilings and oak floors.

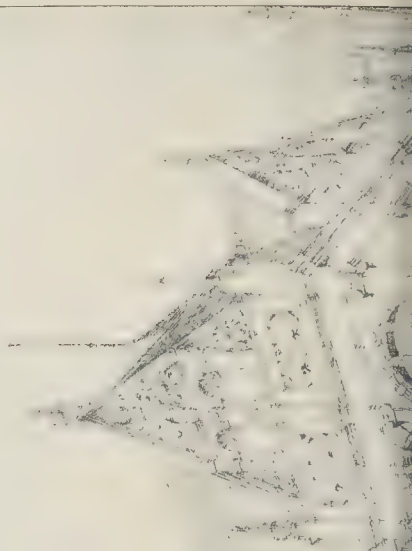
Outside there is a large forecourt on the south, a small one on the north, and a long



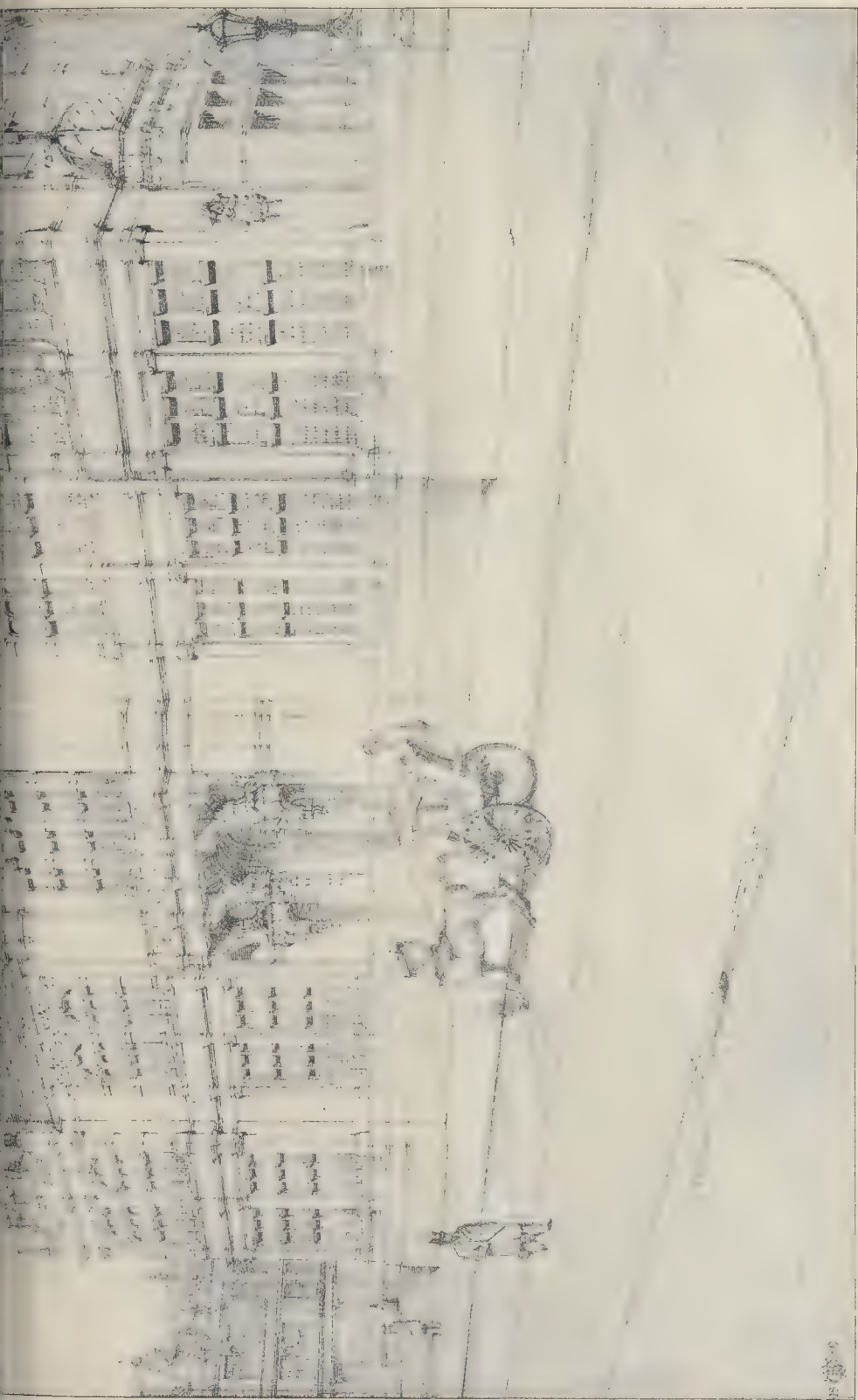


THE BUILDER OCTOBER 4, 1890

THE BUILDER  
OCTOBER 4, 1890



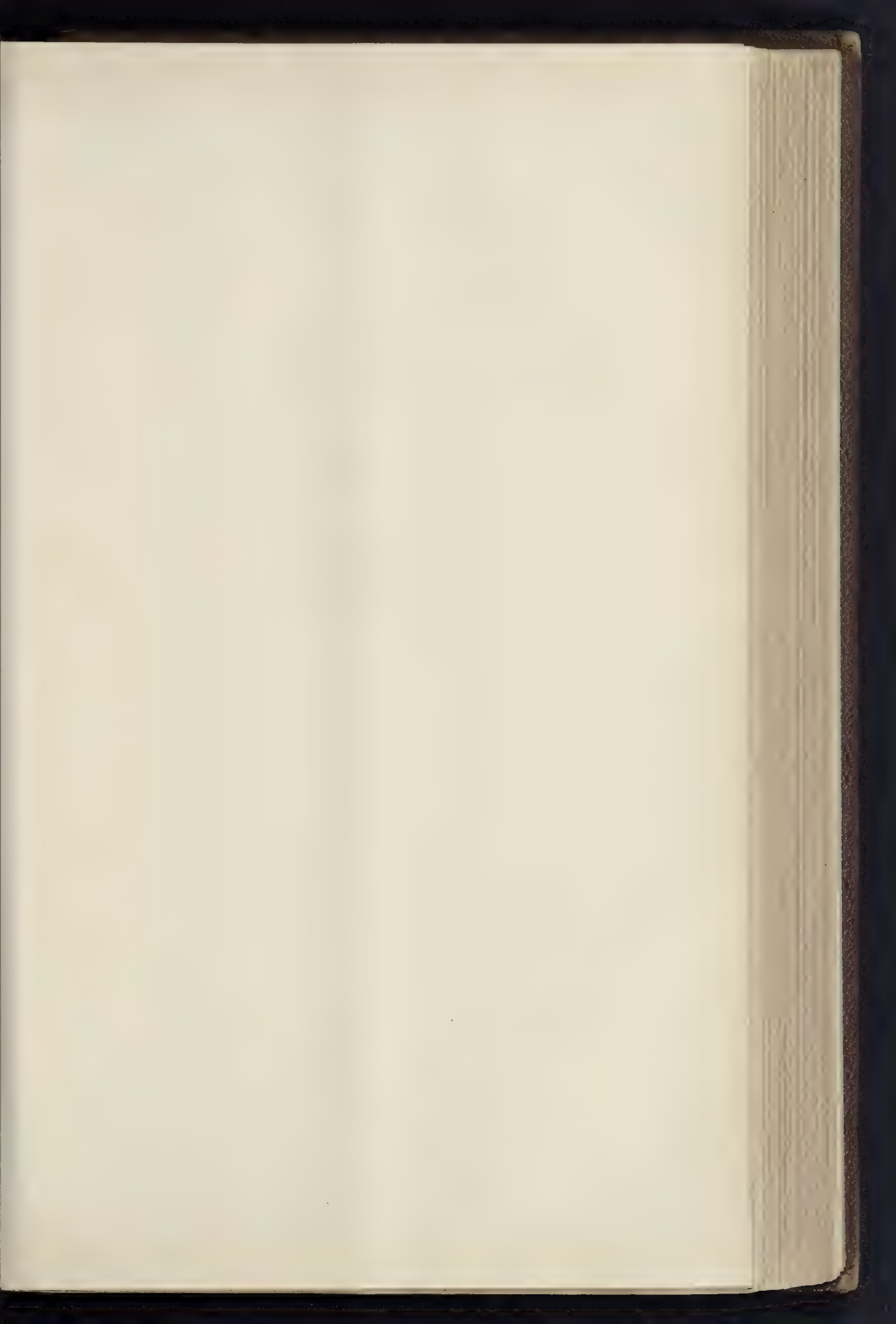




Royal Academy Exhibition, 1890

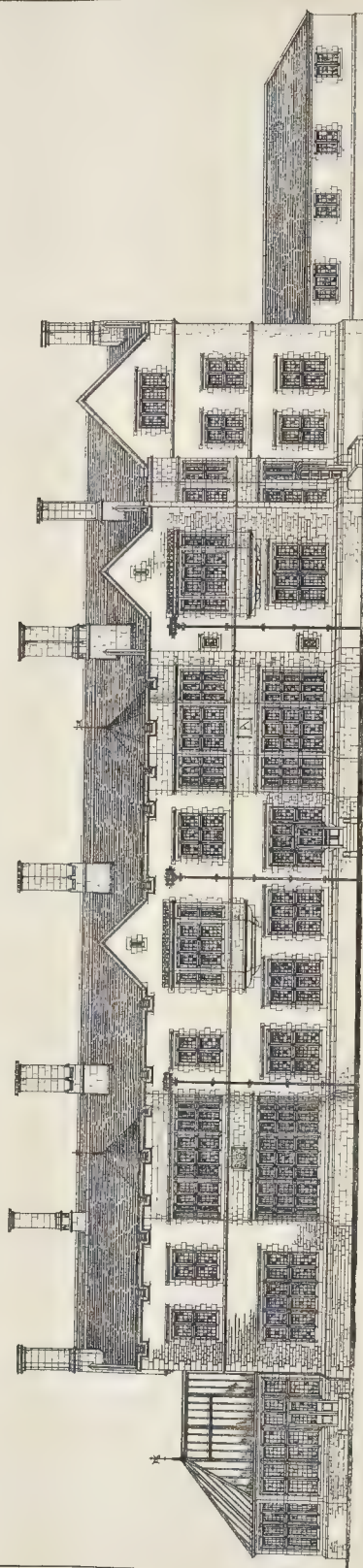
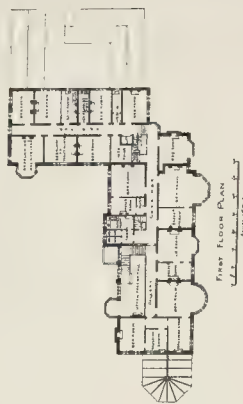
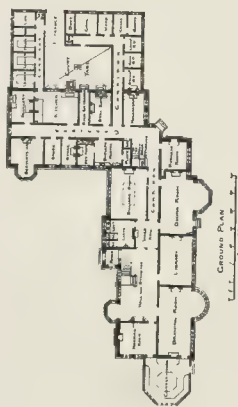






THE BUILDER OCTOBER 4 1890

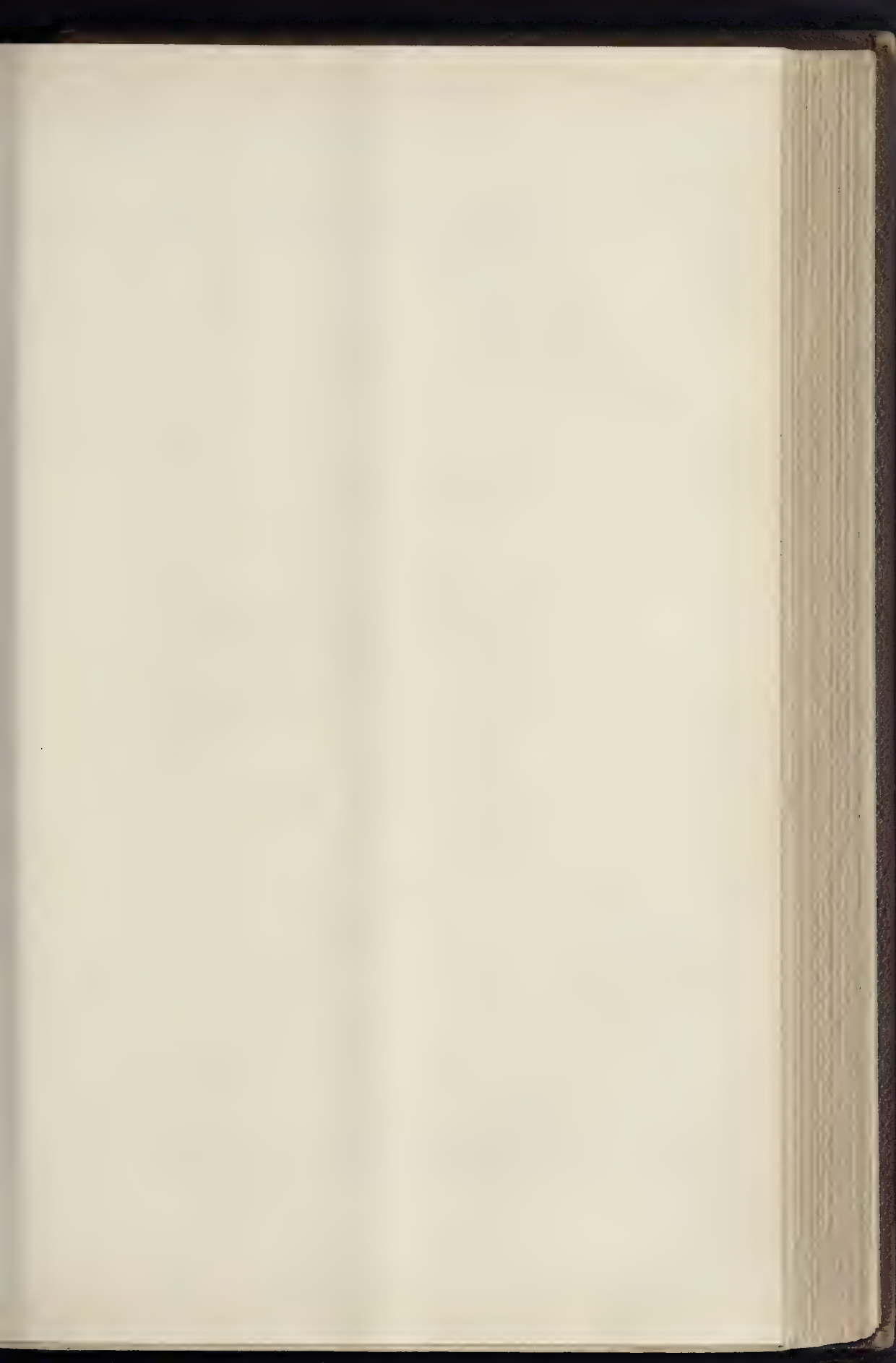
# A COUNTRY HOUSE. LOUIS AMBLER, A.R.B.A., ARCHTCT.

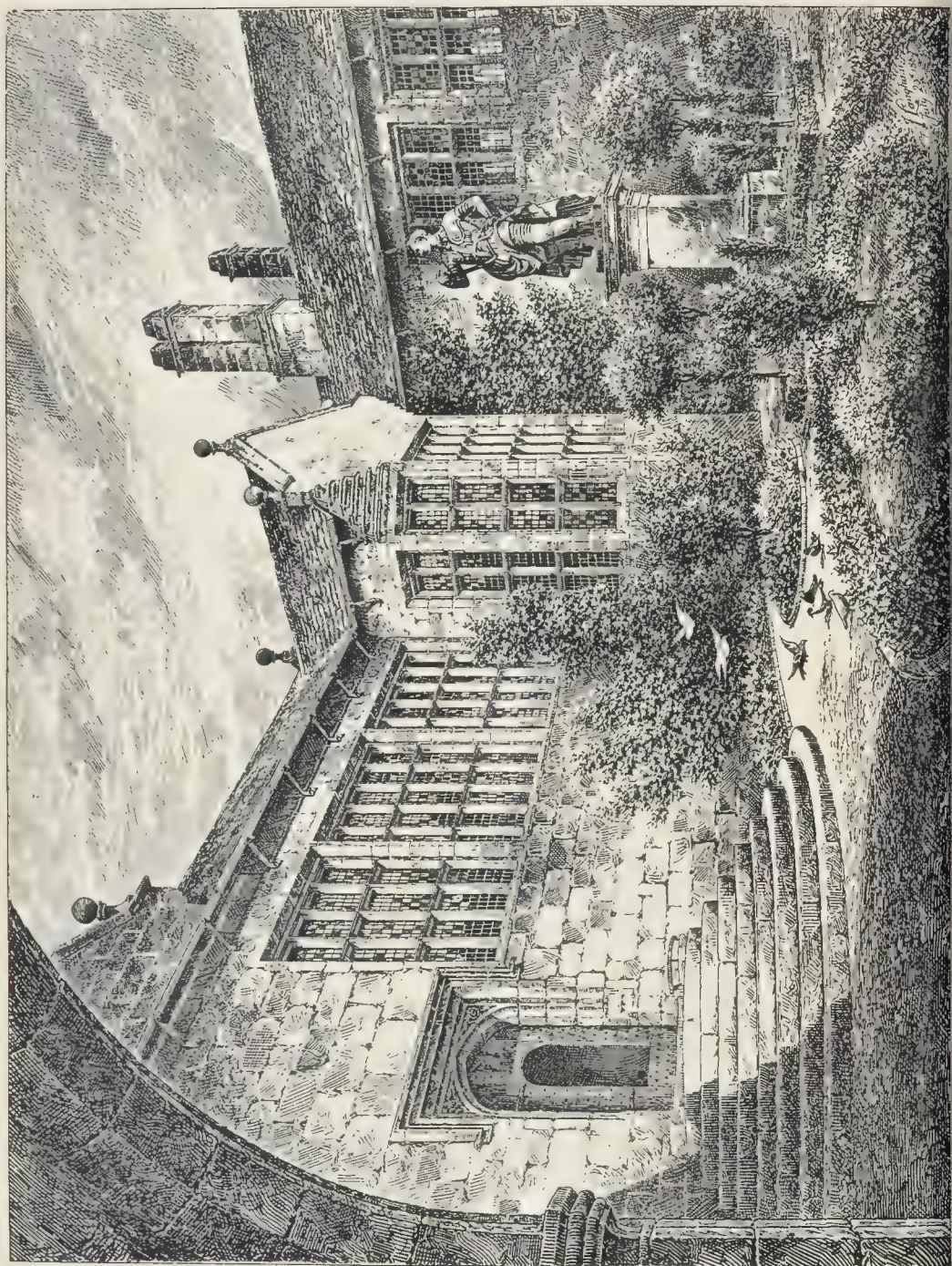


SOUTH ELEVATION, GARDEN FRONT.

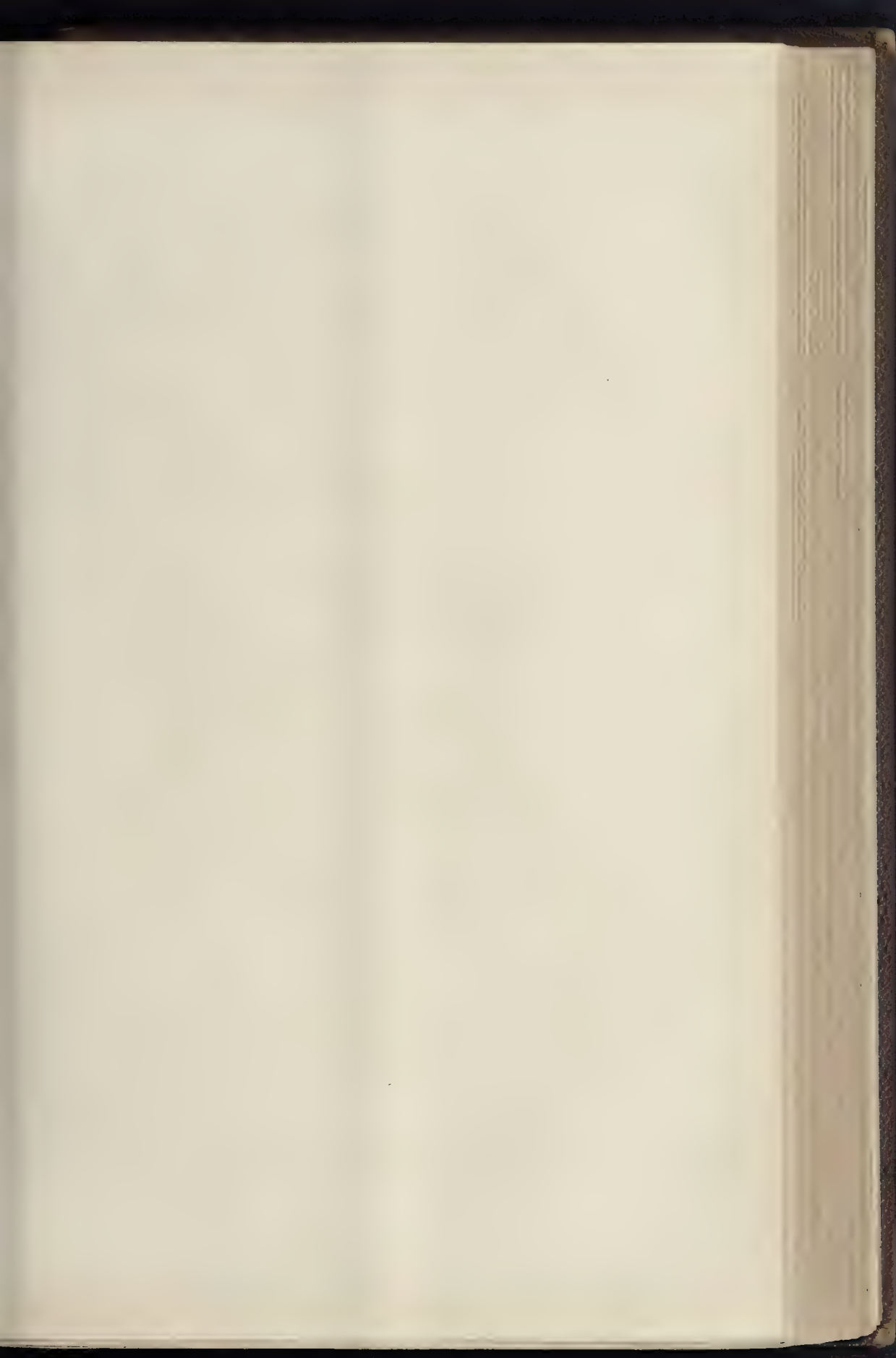
Scale of Feet











THE BUDGET - OCTOBER 8, 1944







TRIUMPHAL ARCH, TIMGAD, ALGERIA.—FROM A DRAWING BY M. VITASSO, GRAMM, F.S.A.







PHOTO LITHO. SMALLER & CO. 22, MARK LANE, CANON ST., LONDON, E.

Royal Academy Exhibition, 1890

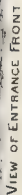
BULLERS WOOD, CHISLEHURST — MR. ERNEST NEWTON, F.R.I.B.A., ARCHITECT.





LOUIS AMBLER, ARCHT. ARCHT.

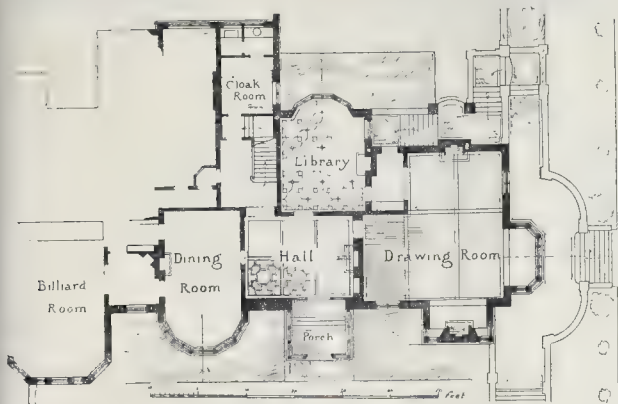
LOUIS AMBLER, ARCHT. ARCHT.



VIEW OF ENTRANCE FRONT







Plan of Bullers Wood, Chislehurst.

terrace on the east, with brick walls and stone steps and balustrades.

The house is lighted throughout by electricity. This is generated on the spot, engines and dynamos being in duplicate. The chief electric fittings are designed by the architect, and made by Messrs. Shirley & Spence, of Rathbone-place.

The builders are Messrs. Arnand & Son, of Bromley; electrician, Mr. Drake (working under Messrs. Lea & Thornbury, of Birmingham); the plumbing was done by Messrs. Mathew Hall & Co.; the windows and casements by Messrs. Wenham & Waters; the hot-water supply by Messrs. Longden & Co.; the ceilings by Messrs. Jackson; floors by Messrs. Arrowsmith; and the wood-carving by Mr. Knox. Mr. Thomas Spooner was clerk of works.

The architect was Mr. Ernest Newton. The drawing from which the illustration is taken was exhibited in the Royal Academy of this year.

#### COMPETITION DESIGN FOR SHEFFIELD MUNICIPAL BUILDINGS.

The perspective drawing of this picturesque design, by Mr. B. Woollard, was exhibited in the architectural room at the Royal Academy this year.

The designer has not been able to furnish us with a plan, and we give the drawing merely as a specimen of architectural design for a special site.

#### DESIGN FOR A COUNTRY HOUSE.

We do not usually publish designs which, as we take this to be, are for imaginary buildings only; but the geometrical elevation of this was accepted at the last Royal Academy Exhibition as an example of domestic architecture, and we therefore give it a place in our plates, accompanied by the perspective view which further illustrates the design.

Without exhibiting anything strikingly original, the design has the merit of simplicity and suitability for its purpose, and a certain amount of character and expression is given to the exterior by the arrangement of the windows in reference to the apartments they give light to. The placing of the hall and staircase windows shown in the perspective view is especially a good point in the design.

The author is Mr. L. Ambler, architect, of London and Brentford.

#### COMPETITIONS.

**NEW BUILDINGS, SUNDERLAND.**—We are informed that the plans of Mr. T. R. Milburn, A.R.I.B.A., have been chosen by the Sunderland Corporation, in an open competition, for restaurants, shelters, cafés, shops, concert hall, and public cloak-rooms, to be built on the Lower Promenade at Roker.

**WHITEFIELD'S TABERNACLE.**—Professor Roger Smith has issued his report on the designs submitted for the rebuilding of Whitefield's Tabernacle in Tottenham-court-road. The report recommends the design signed "Winged Heart" for the first premium, and that signed "Lux Mundi" for the second. The former is by Mr. F. Boreham, the latter by Mr. J. M. Brydon. Ten designs were sent in.

#### ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS:

##### VISIT TO EDINBURGH.

THE Association of Municipal and Sanitary Engineers and Surveyors held a two-days' meeting at Edinburgh on Friday and Saturday of last week, under the chairmanship of their President, Mr. H. P. Boulnois, City Engineer of Liverpool.

On Friday forenoon a meeting was held in the hall, 117, George-street, when two papers were read,—one by the Burgh Engineer of Edinburgh (Mr. Cooper) on "Municipal Work in Edinburgh," and the other by Mr. W. N. Colam on "The Cable Tramways of Edinburgh."

In his paper Mr. Cooper first welcomed the Association to the city, and pointed out how by the formation of County Councils an opportunity was presented for the inauguration of a new era of sanitary work. Passing on to deal with municipal work in Edinburgh, he called attention to several facts to show that the city itself was about to begin a new history. These facts were the completion of the Forth Bridge, by which the city had become an emporium of traffic, and increased railway accommodation had been made necessary; the acquisition of the gas supply, and the intended acquisition of the horse tramways, the proposed increase of the water supply, and the application to Parliament for powers to better deal with various local matters. As to the municipal work of the recent past and the present, Mr. Cooper explained first the Chambers Improvement scheme, and the system of sanitary administration in relation to infectious disease. On the authority of the Medical Officer of Health it was known, he said, that the zymotic death-rate had decreased from 3.33 per thousand of the population in the period 1870-79 to 1.82 per thousand of the population in the period 1880-89. The Public Health Committee, he also said, had for several years maintained a spirited oversight of the poorer districts of the city, although the mortality and infectious disease statistics showed that there was much yet to be done before all sources of physical, if not moral, deterioration were rooted out. The following particulars would give an idea of the amount of work done in this direction:—Number of uninhabitable houses dealt with during the last five years, 2,000; number of houses closed as being uninhabitable, 1,006; number of tenements of houses where water-closets have been introduced by order of the authorities, 1,100; number of sinks introduced by order of the authorities, 650; number of tenements where the drains and sanitary appliances have been overhauled and put into good order, 3,400; all the work at a cost to the owners of 57,000*l*. He was strongly of opinion that the condition of the slums and poorer districts of a city was a very fair measure of the extent to which its civic rulers and officials were conscientiously alive to their duty. The lines of action followed by Edinburgh, to which he had referred, might not have been pursued so actively as was desirable, but the plan of her action was intelligible, and the results had been so far satisfactory. An experiment had been made with one small

scheme of model dwellings for the very poor, containing some thirty-three houses, with rentals from 6*l*. 10*s*. to 9*l*. It was situated in the West Port, a district where such accommodation was much required, but the cost of acquiring the site had handicapped the scheme itself, and entirely prohibited any further effort in the same direction. On the question of the duty of a local authority to provide suitable dwellings for the poor, there was in Edinburgh considerable diversity of opinion, and serious opposition by the Magistrates and Council themselves. The Society would confer a boon upon the citizens should they shed light upon this subject. Mr. Cooper next called attention to the system of inspection of the drainage and sanitary appliances of houses and buildings, and paid a tribute to the Dean of Guild Court work of the late Sir James Gowan, whose memory, he said, inspired them still. He then explained the sewerage system of Edinburgh, mentioning also the new scheme for the purification of the Water of Leith. He afterwards alluded in succession to the roads, streets, pavements, and footpaths, quoting from information supplied by the City Road Surveyor (Mr. Proudfoot), and also to the cleaning of the city. Regarding Princes-street, he said it was likely the whole of that street would be shortly repaved in wood—either beech or red-wood. A stretch of beech-wood paving properly seasoned and creosoted, 250 yards by 8 yards in width, was laid down last year, and with the exception that it became very slippery during wet, frosty, or muggy weather, and required to be kept exceptionally clean, and occasionally sprinkled with sand or fine gravel, it was giving satisfaction. As to the re-paving of the street, of course the old concrete foundation remained good, reducing the cost of re-paving to that extent; the cost of the beech-wood paving, not including the concrete bottom, was 10*s*. 4*d*. per superficial yard. As regarded wood paving otherwise, he confessed that Edinburgh had never given this kind of paving fair play. At the present time they had only two or three short streets, where noiselessness was of first importance, paved with it. At the beginning of the era of wood paving they did try it on one or two of the busy thoroughfares, as the wood blocks were simply laid on the original cross-cross wooden boarding, a seven years' trial was deemed sufficient, and they again fell back on the whinstone sets. Mr. Cooper closed by giving a short résumé of the powers as to the formation of streets and the erection of houses which the Corporation proposed to submit for the sanction of Parliament next session.

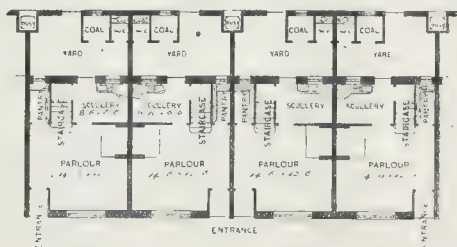
Mr. Colam, in his paper, first spoke generally of the development of the cable tramway system, and then in detail described the Edinburgh system. He mentioned a number of the facts which were contained in his paper recently read before the British Association.\* Alluding to the question of speed, he said an application had been made to increase the speed from six to eight miles per hour. It seemed manifestly unfair they should not be allowed to increase the speed, because steam tramways were now worked with loads of twenty tons behind them down inclines of 1 in 14, with really practically nothing like the control that the cable car had. The cable car had two complete and distinct sets of brakes in case it was entirely disconnected with the cable. But, assuming that all the brakes were done away with by some extraordinary mishap, the cable itself would act as a brake for the car, and would prevent the car going at a greater speed than the cable. So that if everything were to go, the car could always return to the speed of the cable, which was limited.

A discussion took place on the papers. The speakers were, the Chairman, Mr. de Courcy Meade (Hornsey), Mr. Edward Pritchard (London and Birmingham), Mr. Charles Jones (Ealing), and Mr. Lobley (Hanley). Mr. Pritchard, in his remarks, said, with regard to paving, he had read in the *Scotsman*, in a statement from a special correspondent, the announcement that one of the ablest Town Councillors of Edinburgh was devoting his time inquiring into the best means of paving; and he (Mr. Pritchard) noticed some remarkable information in that announcement—information which he before certainly was not in possession of, and he rather hesitated now regarding it. He wished to point out, however, that wood-paving in its best form was a luxurious

\* See Builder for September 13, p. 206.

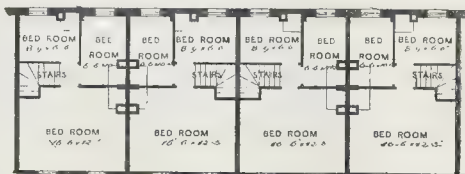


FIRST-FLOOR PLAN CONTAINING 3 BED ROOMS

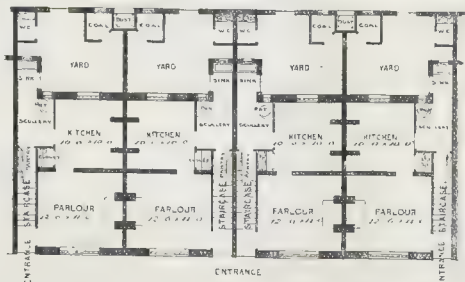


GROUND PLAN CONTAINING 3 BED ROOMS

EACH HOUSE TO COST £165



FIRST FLOOR PLAN CONTAINING 3 BED ROOMS



GROUND PLAN CONTAINING 3 BED ROOMS

EACH HOUSE TO COST £200

*Scheme for Workmen's Dwellings, for the Rev. Arthur Robins, M.A., of Windsor.  
Messrs. R. Knill Freeman & S. Denison Robins, Architects.*

paving, but it had not the life that the writer of the *Sootsman* told them it had.

On the motion of the Chairman, seconded by Mr. Meade, a cordial vote of thanks was passed to Mr. Cooper and Mr. Colam for their papers. The vote was suitably acknowledged.

The members afterwards, under the guidance of Mr. Colam, inspected the cable tramways system and depot. They lunched with the Town Council, and in the afternoon visited the Exhibition. In the evening they dined in the Royal Hotel.

On Saturday the party visited the Forth Bridge, and inspected the Craighinty Meadows and the Water of Leith works.

#### DWELLINGS FOR THE POOR.

THE Rev. Arthur Robins, of Windsor, who has taken such a deep interest in the great question of the better housing of the poor, read a paper on this subject, by the invitation of the Archbishop of York, at the Hull Church Congress on the 30th ult. He proposed to show that "human homes" for the poor can be built so as to pay, and to this end he produced a practical design for working-class dwellings, by Messrs. Knill Freeman & Denison Robins, architects, Newcastle-upon-Tyne. It has always been urged as an excuse for doing nothing that it will never pay to build decent dwellings for the poor. By means of the plans which we publish in our issue of to-day, the Rev. Arthur Robins undertakes to demonstrate that not only is it a Christian duty to give "human homes" to all our poor, but that the duty can be so discharged as to become a remunerative transaction, and that such dwellings can be built so as to produce, at a moderate rental, a very fair return upon the outlay.

#### THE LONDON COUNTY COUNCIL.

THE London County Council held its first meeting since the Autumn recess on Tuesday last, the Chairman, Sir John Lubbock, presiding.

*Open Spaces in St. Pancras.*—Paragraph 8 of the Parks' Committee's report of July 23, which was adjourned over the recess, was as follows:—"On June 24 last we reported that the Vestry of St. Pancras had asked that a sum of 1,500l. might be voted to them out of the 12,000l. paid by the Midland Railway Company for the acquisition of new or the improvement of existing open spaces in the parish. This sum of 12,000l. was paid by the Railway Company as compensation for a portion of the recreation-ground on the improvement of which the Vestry desire to expend the 1,500l. The improvements consist in the building of a keeper's lodge; the draining of the ground, and the sloping of it towards the adjoining roadway; and providing a greenhouse, urinals, iron gates, new railings, stone steps, &c. We considered that the Council might properly, under the circumstances, make the contribution asked for, and we so reported, but the recommendation was subsequently withdrawn in order that the wording of it might be amended. We now recommend,—

"That the Council, subject to an estimate being submitted to it by the Finance Committee, as required by the statute, do contribute a sum not exceeding 1,500l. towards works of improvement at the recreation-ground in St. Pancras-road, such money to be taken, not out of the rates, but out of the 12,000l. recently received by the Council from the Midland Railway Company, and to be paid to the Vestry on a certificate by the Comptroller and the architect respectively, as to the expenditure of the money and the carrying out of the works."



After a long discussion on an amendment by Councillor Dickinson, who wished to see the money applied to the acquisition of new spaces rather than to the improvement of existing ones, the recommendation was adopted.

**The London Water Supply.**—The consideration of the following report of the Special Committee on Water Supply had also been deferred from July 29. Councillor Beal now brought up the report, which was as follows:—

"It will be within the recollection of the Council that the General Powers Bill contains a clause for authorising the Council to prosecute and conduct inquiries and negotiations relative to the supply of water, or to companies supplying water, and relative to markets in or near London. The Bill has passed the Commons, and is now in Committee in the Lords. Should it become law,\* it will be desirable for many reasons to enter upon the inquiries with the least possible delay, and it may even be necessary to commence them before the meeting of the Council after the recess. To enable us to do this it will be necessary for the Council to pass a resolution authorising us to undertake the inquiries, and we therefore submit the following recommendation:—

\*That, in the event of the necessary power being given by Parliament, the special Committee on Water Supply and Markets be authorised to prosecute and conduct enquiries and negotiations relative to the supply of water, or companies supplying water, or relative to markets in or near London, provided that the cost of such enquiries do not exceed the limits imposed by the section authorising such enquiries and negotiations."

Before entering upon the inquiry relating to water, referred to in the preceding paragraph, we think it will be desirable to approach the water companies with a view to ascertaining whether it would be possible for the companies and the Council to make some provisional agreement as to the terms upon which the companies' water undertakings should be transferred to the Council if Parliament gives the necessary authority. If some such arrangement as this were made, it would save great delay and expense, and we think that the Council should endeavour to provisionally agree upon terms with the water companies. We therefore recommend:—

\*That the Committee be authorised to enter into tentative negotiations with the water companies for the purpose of ascertaining upon what terms the companies will be prepared to dispose of their undertakings to the Council in the event of Parliament empowering the Council to acquire such undertakings."

These recommendations led to a long discussion, but they were eventually adopted, with certain verbal amendments, by 58 votes for to 37 against; majority for, 21.

**The Sewage Question.**—The Main Drainage Committee presented the following report:—"Your Committee regret that the report of Sir Benjamin Baker and the Chief Engineer cannot be presented to the Council before the end of the year. Sir Benjamin Baker has been called to other pressing engagements to America, and will not return until early in November. Meanwhile your Committee have received from the Chief Engineer a report stating, on behalf of Sir Benjamin Baker and himself, that it would tend greatly to a more perfect understanding of the case, add greatly to the certainty and accuracy of our recommendations, and to any future action on the part of the Council, if some reliable tidal float experiments could be made in Sea Reach, below the Mucking Light, in the direction of Canvey Island, the Chapman Light, and the Nore, recommending the employment of Mr. C. J. Woods, M.I.C.E., and expressing the opinion that the cost for the required two months' observations would amount in all to about 300*l*. Your Committee therefore recommend:—

\*That, subject to an estimate to be submitted to the Council by the Finance Committee as required by the statute, an expenditure not exceeding 300*l*. be sanctioned for all costs in connexion with making the proposed tidal float experiments in the lower part of the Thames."

With reference to the new 4-in. cast-iron water main pipes ordered by the Council on June 24 to be laid from the Manor-road, East Ham, to the Barking outfall, an error was made in the Engineer's department in the estimate of length, and your Committee are now informed that an additional sum of 300*l*. will be necessary to complete the main pipes required. They recommend:—

\*That, subject to an estimate to be submitted to the Council by the Finance Committee as required by the statute, an expenditure not exceeding 300*l*. be sanctioned for all costs in connexion with making the proposed tidal float experiments in the lower part of the Thames."

\*It has become law since the date of the Report.—Ed.  
The resolution, as now moved and adopted, contains the words "the necessary powers having been," in lieu of those italicised.

statute, an additional sum of £380 be sanctioned in respect of the cost of the new 4-in. cast-iron main to be laid from the Manor-road, East Ham, to the Barking outfall, for the purpose of conveying a proper supply of water to the works, the work being carried out under the general contract."

"Your Committee have received from several parts of the County of London various complaints of recent flooding, to which in all directions they are giving their best attention. Measures of relief have been already sanctioned by the Council for the repair and enlargement of the Abbey-mills Pumping-station, for the construction of an important relief sewer in Hackney, for new works in connexion with the Isle of Dogs Pumping-station, &c. Among the cases of complaint on the south side of the river is one as to works near the "White Horse," in Brixton-road, where some very complicated trough-weirs were built by the Metropolitan Board of Works, with a view of carrying off storm-water from the Effra sewer. Your Committee, upon a report from the Engineer, recommend:—

\*That, subject to an estimate to be submitted to the Council by the Finance Committee as required by the statute, the expenditure of a sum not exceeding 250*l*. be sanctioned for the proposed alteration, including the removal of these cast-iron troughs and the building of a brickwork weir 35 ft. in length."

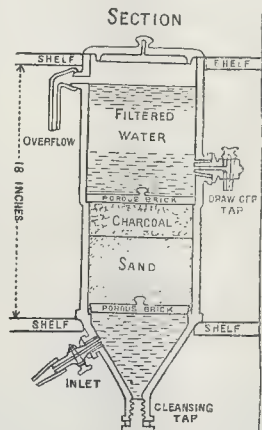
"The attention of your Committee has been directed to the necessity of reconstructing the Council's 5 ft. by 4 ft. sewer in Upper North-street, Poplar. The Engineer reports that this sewer, which is about sixty years old, has holes in its invert from 50 ft. to 100 ft. in length, which are about 12 in. below the proper level, and that its bad gradient has, he is informed, long been the cause of much trouble and expense in clearing out the deposit. He states that if the sewer were reconstructed, a fall of about 20 ft. from Northumberland-street, where floodings have been of frequent occurrence, could be obtained, and that considerable relief would doubtless be afforded to the whole district (about 1½ square miles) draining into the sewer. As a remedy, the Engineer reports it would be requisite to construct a new 4 ft. by 2 ft. 8 in. brick sewer in substitution for the existing one in Upper North-street, Poplar, from the Limehouse Canal to the sewer in High-street, Poplar, a distance of about 800 yards, at an estimated cost of about 6,000*l*. Your Committee has considered these reports, and recommend:—

\*That, subject to an estimate to be submitted to the Council by the Finance Committee, as required by the statute, the execution of the above-mentioned work be sanctioned; that the specification be printed, and that advertisement be issued inviting tenders for the construction of the proposed sewer."

These recommendations were all agreed to, and after the transaction of a great deal of other business, the Council adjourned.

#### THE "LITTLE FOUNTAIN" FILTER.

THIS is a form of filter patented by an architect, Mr. Fogarty, the working of which is sufficiently explained by the section. The



The "Little Fountain" Filter.

object is to provide a filter for drinking-water connected with the house service, which requires no filling by hand, the water percolating

upwards under the pressure from the service-pipe, and being always ready for use. The patentee writes:—

"It is a domestic filter, intended for the pantry, and is fixed between two shelves at about 18 in. apart. It is connected to the main water-supply, or to the supply-tank, and gives a constant flow of water. It is intended to obviate the trouble and inconvenience of having to fill the ordinary type of filter, and as the water is kept constantly running, no stagnant water accumulates or remains in the filter,—a too common complaint in other filters. As the filtering media are composed of ordinary wood charcoal and clean silver-sand, it is a simple matter to renew them when required, thus materially lessening the expense, as it is found in practical working that the carbon blocks used in some filters become clogged, and require to be constantly renewed."

#### Correspondence.

To the Editor of THE BUILDER.

##### AN "EMPLOYERS' UNION."

SIR,—Referring to a letter in your issue of the 20th ult., signed "Contractors," will you allow me to state that this Association fulfils, as regards builders and contractors, all the requirements of your correspondents?

With reference to the ancillary trades I may mention that since this Association was originally founded, in 1872, the members of these trades, with some few exceptions, have always refused to render us any assistance in times of trial.

I have no doubt that, if proper representations were made to my Committee, they would consider the advisability of admitting the allied trades.

I may also mention that this Association is affiliated to the National Association of Master Builders of Great Britain, as well as some other local Associations in between forty and fifty of the principal towns in the country.

E. S. HENSHAW, Secretary.  
Central Association of Master Builders,  
31 and 32, Bedford-street, Strand,  
London, October 1, 1890.

SIR,—I have been away, so did not before see your number of September 20.

I observe there is no date to the letter signed "Contractors."

Surely, it must be an old letter, written twenty years ago and crept into your columns by mistake.

If your correspondents are English contractors, what could they be about or where do they come from not to have heard of the Central Association of Builders, which was established in 1872 for the purpose proposed by them.

I suppose "Contractors" never heard of the 1872 and 1877 strikes!

October 1, 1890. STANLEY G. BIRD.  
We read the letter in question with some surprise, but we presumed that the writers, a large and well-known firm, had their own reasons for wishing for a new departure.—Ed.

#### TRADES UNIONS AND THE BUILDING TRADES.

SIR, Seeing that considerable prominence has been lately given in the columns of the *Builder* to the sayings and doings of the late Congress of the Trades Union delegates, I am constrained to ask what on earth has the congress, or the unions either, to do with the building trades? or, rather, what right have they to assume the authority to speak for those trades when by the utmost stretch of imagination it cannot be said they are in any sense of the word representative of any one particular branch?

Take, for example, the "Carpenters and Joiners," one of the most important, I should say, as to numbers. I take their own words for it, when I state the union does not represent a tenth part of the whole body.

At a meeting which took place a few Sundays ago on Clapham Common, one of the speakers is reported to have said, when calling upon those present to join the union, "that in London alone there are 30,000 of this class of workmen. Yet there are only 3,000 out of the whole lot that were unionists."

Again, in regard to the bricklayers, of whom it was said many years ago the metropolis contained upwards of thirty thousand, a number which by this time must be considerably augmented, I was informed only a few days ago that, taking all England together, about six thousand were members of the union. Now, without going further, I think it must be admitted that, in relation to the unions,



these two branches may be taken as fairly typical of the remainder.

It may perhaps be said that, if not in point of numbers, the Union is representative in the sense that its members are the *élite* of the several trades. This I flatly deny, for the proportion of mediocrity, as against superior skill, is, I know, as great inside as outside the Union.

Now, Sir, taking the foregoing statement to be in the main correct, which I maintain it is, I ask am I not justified in my conclusion, that whatever may be the case with other industries, in so far as concerns the building trades, the union is not representative, and, therefore, has not the slightest claim to arrogate to itself the right to dictate the terms, either as to hours, wages, or methods, by which those trades are to be regulated?

One word more: Mr. Burns himself at the Congress acknowledged that to a Union and a half of Unionists, meaning all classes combined, there are seven millions unorganised (*vide Daily Telegraph*, September 5).

Now, while granting to the million and half the full right to combine, to which they are, undoubtedly, entitled—surely, the seven millions have an equal right, if they choose, not to combine. Herein lies the pith of the whole question.

A LOVER OF FAIR PLAY.

#### THE CONVERSION OF TIMBER BY MACHINERY.

SIR,—I agree with the remarks of Mr. S. Worsam in your issue of Sept. 20, that the merits of the band-saw for converting heavy logs are not properly appreciated in the country. The use of saws for breaking down heavy timber, when compared with band-saws used for the same purpose, possess the advantages of a greater out-put, a somewhat lower first cost, and are perhaps a little easier managed. On the other hand, a well-designed and managed band-sawing machine uses much less power and wastes less wood at the same time the cut is cleaner. In converting valuable woods, this waste is a matter of great importance, and even if mill-saws are used, unless it be a single one, the band-saw possesses the advantage of enabling the operator to examine the figure of the wood as the sawing progresses, and, should soundness be detected, the log may be cut into scantling, or be otherwise more usefully converted.

In America, where inverted teeth are largely used, the saws are of much thicker gauge than ours, consequently the saving in power and wood through using a band-saw is correspondingly greater. It may be of interest to your readers to compare the output of circular and band-saws as used in America. The average output of a first-rate circular-saw, cutting pine, may be set down at about 40,000 ft. per day of ten hours, whilst a band-saw in the same time would produce about 30,000 ft. An American authority, in comparing circular and band-saws, says "that the korf of circular saws averages 5-16 in., and in sawing 1,000 ft. of such boards, 312 ft. is turned into sawdust. The average korf of the band-saw is about 1-12 in., and in sawing the same amount of boards it turns 83 ft. into sawdust. This shows a clear saving of 229 ft. in favour of the band-saw on every 1,000 ft., and on every 1,000,000 ft. of 229,000 ft."—an enormous saving to say the least. The figures given must, however, be very considerably discounted when applied to this country, as the saws in use here are of much thinner gauge, but supposing a reduction of 50 per cent., and the saving is still very great.

I take it three of the chief reasons for large band-saws failing are the employment of blades of too thick a gauge, and allowing them to run over saw-wheels of small diameter, consequently the arc of contact of the saw and wheel is too acute, and cracks are set up at the roots of the teeth which end in fractures. Another reason is that sufficient attention is not given to guiding and supporting the blade as it enters and leaves the cut, and so enabling it to saw in a true vertical line. The writer has overcome this difficulty in a simple manner, and would have no objection to communicate the plan to anyone especially interested. On a well-constructed machine, good saw-blades may with safety be run considerably quicker than the speed given by Mr. Worsam; but it should be regulated by the diameter of the saw-wheel and the nature of the wood being cut. A short saw running over medium-sized wheels cannot, with safety, be run so fast as a long saw running over large ones by several thousand feet per minute. The diameter of the wheels should be in proportion to the thickness of the log sawn, varying from 6 ft. to 12 ft. diameter, the speed of the saw varying in ratio 5,000 ft. to 10,000 ft. per minute. I have found for all kinds of band-sawing a thin gauge saw will stand better than a thick one.

M. POWIS BALE.

Author of "Wood-working Machinery,"  
"Saw-mills," &c.

Appold-street, E.C., September 22, 1890.

#### "A SANITARY NOTE FROM GREENOCK."

SIR,—I shall be obliged if you will permit me a little space to answer Mr. Buchan's letter in your last issue, wherein he criticises some remarks in my former letter to you.

Mr. Buchan seems to consider the chief object of a syphon to be to exclude rats from a house drain. If this be so I agree with him that it answers its purpose fairly well, but I fail to see that this is a matter of importance, because rats cannot do any harm to the drain, and from one which is properly constructed they cannot get out into the house. Rats do not much frequent pipes where they can get into a brick sewer.

I am sorry that Mr. Buchan should not believe that the air in sewers is less impure than in house-drains in most cases, but as a matter of fact it is so. The flow in sewers is continuous, as I pointed out in my previous letter, consequently the soil is always covered with water and moving forward; in a house-drain it seldom happens that one discharge of a closet will put the solid matter into the sewer, the water runs away, leaving the solid in the drain, the next discharge taking it a little further, and, if the drain be a short one, perhaps into the sewer; if not, it may wait for a third or fourth flush of water, but suppose no sink or bath water to have been used between these times there will be several deposits of soil left uncovered by water in the house-drain. This is principally due to the use of water-waste preventers.

As to Mr. Buchan's idea of fever being communicated from one house to another, I see no fear of this, the quantity of water used in a sewer being sufficient to keep fever germs under; moreover, when there is no intercepting trap or syphon between the house-drain and sewer, the closet, and stack pipes discharging on trapped open receivers, and the soil-pipe being ventilated, there would be no danger of fever germs entering the house from the drain.

I am distinct of opinion that the air in a house-drain—disconnected from the sewer by a syphon and with the fresh air in it carried up to the roof of the house—is practically at a standstill. What effect does temperature have on this drain? It is like the letter U, both extremities being brought up to the same level, they are in the same temperature and pressure of atmosphere. Many people who, to use Mr. Buchan's words, "ought to know better," entertain the most ridiculous theories on the question of sewer ventilation. No doubt many of these theories are mathematically correct, but unfortunately they do not obtain in practice, and it is no use basing a system of drainage on theory without practical knowledge. Regarding cows, I have no faith in them. As they are dependent on wind for their action they are worse than useless, and, as there is not sufficient wind to work them, and when there is much wind they are least wanted, as the current of air in sewers is always greatest when the wind is high.

ERNEST VAN PUTTEN,  
Assoc. Memb. Inst. C.E.

Leamington, September 27, 1890.

#### "DANGEROUS ADVERTISEMENTS."

SIR,—The question raised by your correspondent, "An Architect," is a very important one both for the architectural profession and the public.

An architect often feels aggrieved when he is ordered to set back his window-frames, or to make small mouldings with, perhaps, a 3 in. projection, because it is within 4½ in. of the face of the wall; but, on reflection, he knows that in making such a requisition the District Surveyor is only doing his duty. It is a matter for surprise, however, when he finds his next door neighbour is allowed to cover his whole house with matched-boardings, and then proceed to deface it with advertisements, which are both hideous and dangerous, or perhaps, which is nearly as bad, to cover the space from the head of one window to the sill of the next with wooden notice boards, the whole width of his front, setting forth in huge letters his name and the merits of his various wares.

Surely there must be something wrong either in the Act or its application to allow such a state of things as this to continue.

I have heard district surveyors urge that on attempting to deal with this class of advertisement they are at once met with the reply that "they are only temporary erections," or that "they are not a part of the building, and consequently exempt," but I would ask, Sir, if this is the case ever been carried to the superior courts, and, if not, should not the district surveyors combine together to do so, for the purpose of having a definite pronouncement from the judges on the question?

Surely it cannot be maintained that boardings such as your correspondent speaks of, which are put up and maintained for the purpose of producing a yearly rental, and do produce a very large rental, are temporary erections! A notice that a house is to let or a hoarding round a new building are clearly temporary by the very nature of things; but such boardings as one now sees on the face of buildings in or near important thoroughfares all over the metropolis are in quite a different category.

Then, again, to contend that notice-boards, which are so freely plastered over the fronts of buildings in all directions, are not part of the building when they are fixed to it by iron holdfasts is manifestly absurd. A tenant erects some fitting for his own convenience inside his house and fixes it to the walls; this is held to be part of the house and

becomes his landlord's property at the termination of his lease, unless otherwise agreed. In what respect does a fitting fixed outside the house, also for the tenant's convenience, differ from that inside? Surely this must also be part of the building.

The matter resolves itself into this:—Are these notice boards and advertisement hoardings infringements of the fourteenth section of the Building Act or are they not? If they are, why is the law not enforced? If they are not, should not representations on the subject be made to the County Council to induce them to take steps to amend the Act?

"ANOTHER ARCHITECT."

London, September 27, 1890.

#### WHITEFIELD TABERNACLE COMPETITION.

SIR,—From the report of Professor Smith, the assessor in this case, he appears to have given the first premium to a design, "Winged Heart," which has exceeded the frontage to Tottenham Court-road by some 6 ft. above what was shown by figures on the site plan issued to competitors. As one who kept strictly to those figures I should like to know by what authority "Winged Heart" adopted a greater frontage. The assessor also states that "Lux Mundi" has done the same thing, which he notices "with regret, but thinks it does not infringe the spirit of the instructions;" and, in commenting on "Hearing and Seeing," he speaks of it as having encroached upon the side land for steps and areas. This seems contradictory, as he sanctions it in the two designs referred to.

Every one knows that where figured dimensions are given they are to be adhered to, unless competitors are told to chafe them, of which nothing was said in these instructions; and we all know, in a restricted site, how an extra 6 ft. makes all the difference in planning; and in this case it was assumed that in fixing the dimensions the Committee had some special reason for not giving what may, or may not, be the actual available frontage. I am, therefore, also sore at the award to other competitors. I therefore protest against the award, solely on the above grounds, and maintain that "Winged Heart" was disqualified, and that the premiums should have been awarded to the two best designs which had adhered to the instructions.

A COMPETITOR.

#### SCALE RULES FOR ORDNANCE MAPS.

SIR,—The use of Ordnance maps has now become so general that it would be a great boon if the mathematical instrument-makers made a pocket rule, on the inside bevelled edges of which were 1 in. and 8 in. to a mile, and the 1 in. and 8 in. scales. This arrangement would occupy one side of the rule, and the other could be utilised by the most commonly used scales—viz., 3, 1, 2, and 1 in.

Should chain scales be needed, they could be placed on the flat part of the rule, or on the edge at the back of the bevelled ones.


The great need, however, is the handy reference to the "Ordnance scales" on the pocket rule.

JAMES JERMAN, F.R.I.B.A.

#### The Student's Column.

##### HOT-WATER SUPPLY.—XIV.

COVERING PIPES AND RESERVOIRS FOR THE CONSERVATION OF HEAT (continued).

 METHOD sometimes adopted for covering outside pipes is to run them within a larger pipe, such as is used for rain water, filling in the intervening space with sand or some other material. This plan is neat and convenient in the first instance, but it is very disadvantageous should a leakage occur, when it becomes necessary to displace most of the large pipes, or to break out one of the lengths.

There are various materials in the market prepared and sold expressly for covering heated surfaces to prevent radiation and loss of heat; these generally take the form of a cement, and are largely used for coating steam-boilers and tubes in which conservation of heat is so very necessary; but these materials have not been taken to at all favourably by hot-water engineers. No doubt the chief reason is that they are a little difficult of application compared with felt and some other substances, and with these latter there is less trouble occasioned should it be necessary to expose and afterwards re-cover the pipes.

There is a material deserving of special mention on account of its excellent qualities, and which is used alike by steam and hot-water engineers. This is "slag wool," a material obtained as a waste product from blast furnaces; it is a fine, soft, woolly substance, and an ex-

"Our correspondent is mistaken; the words quoted from the report refer to the design signed 'Red Cross'."



cellent non-conductor of heat, as it is wholly composed of glass (silica). For packing pipe cases it equals hair, and its cost is very reasonable, being about 12s. per cwt.

Asbestos is, of course, a suitable material for the purpose under discussion, but it is little used in hot-water work, probably on account of its cost.

Sand, where it can be used, is also a poor conductor of heat, as this is chiefly composed of silica, the same as slag wool; but it is not so easy of application as this latter material, which is a woolly glass.

#### CONVERSION OF A TANK APPARATUS TO THE CYLINDER SYSTEM.

It very frequently happens that when any extensive repair is being carried out, or from some other such cause, it is thought desirable to convert an old apparatus to a more modern system, and the change can usually be effected without very great expense, that is to say, at considerably less expense than erecting a new apparatus.

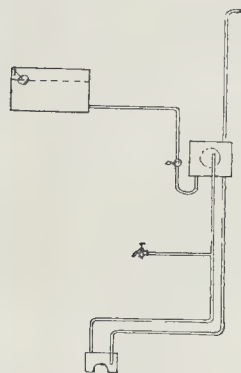


FIG. 28.

The most usual method, when circumstances will allow, is to utilise the existing flow and return pipes of the tank system for the rising main and cold supply to the cylinder, respectively. Fig. 28 shows a small, ordinary style of tank apparatus, and fig. 29 shows the same

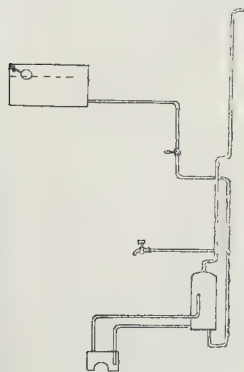


FIG. 29.

apparatus converted. It will be seen that the conversion requires the removal of the tank entirely by this method. The flow-pipe which entered the tank has to be continued up to above the level of the cold-water cistern; the cold supply service which was carried into the tank must be connected on to what was the return pipe, and this completes the alteration at the top of the house. In or near the kitchen the original flow and return services have to be cut, and the cylinder inserted as shown, the flow and return from the boiler being connected

into the cylinder in the usual way, the continuation of the flow-pipe has to be connected into the cylinder at the top to form the rising main service, and, lastly, the lower extremity of the cut return pipe (which is now connected with the cold-water cistern at the top of the house) has to be carried into the bottom of the cylinder, forming the cold supply. The stop cock in this service, which we have left at the top of the house, can, of course, remain there, but it is much better to bring it down close to the cylinder, so that when a workman has to use it there is no occasion for him to traverse the house three or four times, certainly twice.

The alteration at the top of the house can be lessened if desired by the non-removal of the tank, this article being left to increase the cold water supply; in this case the only change to be effected at the top of the house is to convert the flow-pipe into a rising main carried to above the level of the cold cistern, as Fig. 30.

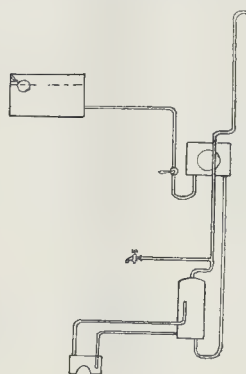


FIG. 30.

It will be noticed that the conversion described (Fig. 29) does not provide for the rising main being returned; this, if it is necessary, must be a distinct and new service, and it becomes a necessity should there be any draw-off services that were "returned"; as otherwise there will be no service-pipe to return them into. This brings to notice the only disadvantage of the cylinder system, which is that a good and complete apparatus has to have three pipes down the house, whereas the tank system needs only two; but after all the difference is not so very great, as the pipes above the cylinder

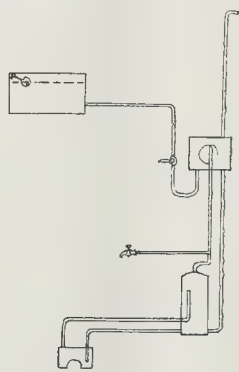


FIG. 31.

do not require to be so large as the flow and return of a tank apparatus.

Sometimes the conversion can be effected without interfering with the tank at all, but the circumstances have to be rather special. As an instance, let it be supposed that the existing tank system which is to be converted has a tank, say 25 or 30 gallons, which has proved to be rather insufficient for the demand;

or supposing the demand for hot water has increased and a larger kitchen range or a larger boiler is being introduced, then in either of these instances, instead of taking away the tank, it can be allowed to remain and a small-sized cylinder inserted below, as fig. 31, it being arranged for the contents of tank and cylinder together to be, say, 55 to 60 gallons, if the range is of fair size, or according to the general requirements.

This arrangement can be but seldom resorted to, as most usually the tank will be found of ample size, and capable of fulfilling the demand, in which case to insert an additional reservoir would in all probability be more than the boiler could heat successfully, and a limited success in this work may be considered a failure.

The illustration shows exactly what is necessary in a conversion of this character. There is no alteration whatever needed in the upper part of the house, except that it must be seen that the flow-pipe in the tank terminates in a high position, say, within 3 in. or 4 in. of the top, and not on any account near the bottom of it. The insertion of the cylinder below differs a little from the arrangement last explained, as will be seen by comparing the two illustrations, as the original return-pipe still remains a return-pipe, and instead of being connected high up into the side of the cylinder, it must be brought in at or near the bottom, as we cannot look for much hot water in this pipe, and it must be kept away from the draw-off services accordingly.

The following diagram, fig. 27, was inadvertently omitted from its proper place in the last of these articles (p. 251 *ante*).



FIG. 27.

#### GENERAL BUILDING NEWS.

**NEW MISSION CHURCH AT LANDORE.**—On the 26th ult., Lady Vivian laid the foundation stone of a new mission church at Landore. The building is to be of native stone, rough cast on the outside and plastered to a smooth surface inside, with the chancel arch window and doors of red brick quoins. The nave is to be 60 ft. by 24 ft. 6 in., and is to be entered by a porch. Accommodation is provided for 300, and the contract is for about 600*l*. The work is to be carried out from the designs and under the superintendence of Messrs. J. Buckley Wilson, F.R.I.B.A., and Glendinning Moxham, architects, Swansea. Messrs. Gustavus Bros. are the builders.

**NEW BUILDINGS AT THE MAIDSTONE MUSEUM.**—The formal opening of the new Bentlif wing at the Maidstone Museum took place last Monday. The new building has a frontage to the street of 45 ft., and measures 56 ft. from back to front. On the ground-floor are a reference library 31 ft. by 32 ft. and a room 54 ft. by 20 ft., while the floor above contains two galleries for the exhibition of pictures. The floors throughout are fireproof, and are laid with solid oak blocks. The heating is by hot water, supplemented by fire-places. The work has been carried out by Mr. James Clements and Mr. Henry Brennan, under the direction of the architect, Mr. Hubert Bensted, F.R.I.B.A.

**NEW SCHOOL HALL, CHINGFORD.**—On the 25th ult., a new congregational school hall at Chingford was formally opened. The building has a frontage of 100 ft. to the Buxton-road, and 45 ft. to the Drive, and consists on the ground-floor of a hall 56 ft. long and 29 ft. wide, capable of seating 300 people; two large class-rooms, entrance-hall, and a completely fitted kitchen. The building is faced outside with red bricks and Bath stone dressings, with tiled roofs, and has pointed windows, glazed with lead lights. The hall is warmed by means of Grundy's warm air apparatus. The buildings have been erected from the designs and under the superintendence of Mr. Rowland Plombe, F.R.I.B.A., of London, by Mr. J. F. Sargeant, of Hackney.

**ST. THOMAS'S CHURCH, STOURBRIDGE.**—was opened last week after additions and alterations. The architects were Messrs. Cotton & Ridlake, of Birmingham.

**NEW R.C. CHURCH FOR PAISLEY.**—On the 27th ult. the memorial-stone of the new Roman Catholic church being erected at the west end of George street, Paisley, was formally laid by Archbishop Eyre, of Glasgow. The church is in the Gothic style of architecture, and consists internally of nave with aisles, the nave being divided into six bays, separated from the aisles by octagonal pillars. These pillars are of stone from the Giffnock quarries. There are seven three-light windows in the clearstory, and a similar number of windows in each of the aisles. The organ gallery is being erected at the north end of the church, where also will be the baptistry and the confessionals, whilst the vestry-rooms are on the south side, close to the church. The main window of the nave will consist of five lights 30 ft. in height. The church is being built of red stone from Lochbriggs quarry. Accommodation will be provided for about 300 worshippers, and the cost of the building will be fully 5,000l. The architects are Messrs. Pugin & Pugin, of London.

**RE-OPENING OF ST. MICHAEL'S CHURCH, SOMERTON.**—The ancient parish church of Somerton, after complete restoration, was re-opened on Monday last by the Right Rev. Lord Arthur Charles Hervey, Bishop of the diocese. The whole of the roofs of the nave and aisles have been replaced, the decayed timbers removed, and new wood substituted. The roof of the south aisle has been almost wholly re-timbered; but the major portion of the magnificently-carved nave roof has been retained. The arcades on the sides of the nave and the piers supporting the arches have been rebuilt, and the whole of the walls have been thoroughly repaired. The floor has been raised to nearly its original height, and covered throughout with a bed of concrete, while upon this solid wood blocks have taken the place of the decayed boards and joists which originally rested on the earth. The old memorial stones in the aisles have been relaid, the gallery has been entirely removed, and an apparatus for heating the church with hot air has been fixed. The ancient ends of the seats in the nave have, as far as possible, been retained; but the seats in the aisles have been modernised. A painted window is placed at the east end of the church at the cost of Colonel Pinney. The chancel has been restored, at a cost of about 700l., by the lay rector (the Earl of Ilchester), who employed a local architect and builder, and had the work carried out entirely according to his own ideas. The work of restoration has been carried out at a cost of some 3,500l. by Messrs. Merriek & Sons, of Glastonbury, from the plans of Mr. George Vials.

**RESIDENTIAL FLATS AT KENSINGTON.**—The Commissioners of the Exhibition of 1881 having sold the ground immediately in the rear of the Royal Albert Hall to Messrs. Geo. Newman & Co., of Billiter-street, and Delford, this firm is now erecting on the site, covering an area of four acres, blocks of residential family flats. The plans for these buildings have been prepared by Mr. F. Hemmings, A.R.I.B.A., of 7, Fenchurch-street, E.C. Messrs. Mark Fawcett & Co.'s system of fireproof construction has been adopted for all floors.

**CHURCH RESTORATION AT LYNDFORD.**—On the 24th ult., the Church of St. Petrock, Lydford, was re-opened for Divine service by the Lord Bishop of Exeter, after having undergone enlargement and restoration. The church is of the thirteenth century, and the present work of restoration and enlargement was commenced in the year 1888, when the chancel was restored. A vestry has since been built, and also a new north aisle. The roof of the church has been restored, new oak timbers having been used. Under the tower arch a new oak screen has been placed. All the flooring of the church has been laid with solid wood blocks, and the plastering has been removed from the walls, which have been re-pointed internally and externally. The windows have been re-glazed, and new stonework inserted where required. The porch has also been restored and paved with granite. The architect is Mr. S. Hooper, of Hatherleigh, and the contractor Mr. William Petherick, also of Hatherleigh. The general carving in the interior of the church has been effected by Mr. Harry Hems, of Exeter. The cost of the work is 850l.

**NEW WING, SUFFOLK CONVALESCENT HOME, FELIXSTOWE.**—A new wing to this institution has recently been opened. The new erection, which is for women, occupies the western side of the building, and will accommodate thirty patients. The south front on the ground floor is devoted to two sitting-rooms, and the entire north front is occupied by a common dining-room, capable of dining seventy persons. On the north side and in a separate block are the lavatories, sea bath-rooms, &c. The bath-rooms have the inside walls lined in white glazed tiles, with the floor of the sea baths are in porcelain, with hot and cold sea water laid on thereto. On the first and second floors are dormitories, three on either floor, bath-room, lavatory, &c. The facings of the building are in red brick up to the first floor; above this it is weather tiled. The roofs are covered with Broseley tiles. The total cost of the building will be about 3,200l. The work has been executed from Mr. E. F. Bishopp's designs and under his supervision, by Mr. Thomas Ward, of Felixstowe.

**NEW R.C. CHURCH AT FORT-AUGUSTUS, N.B.**—The foundation-stone of a new church which is to be erected at the Benedictine Monastery, Fort-Augustus, was recently laid by Archbishop Smith of St. Andrews and Edinburgh. The new building will occupy a commanding site immediately adjoining the monastery, and overlooking Lochness and the river Tarff. Designed in the Early English style of architecture, the new church will be about 300 feet in length, and will be connected with the monastery and college by three cloisters. The Abbey Church will provide accommodation for the celebration of the full services of the church, there being, in addition to the main building, the Lady Chapel, the Chapel of the Blessed Sacrament, twelve small chapels, chapter-room, baptistry, and three sacristies. The pile of buildings will be surmounted by a tower rising to a height of 260 feet. The church will be built of grey granite, with free-stone dressings, and the interior throughout, including the groined roof, will be built of Rosebrae stone. The new church is being erected from designs by Messrs. Pugin & Pugin, of London, and is estimated to cost over 60,000l.

**NEW CHURCH FOR PENARTH.**—The foundation-stone of the new All Saints' Church was laid by Lady Windsor some days ago. The site, situate in Victoria-road, was presented by Lord Windsor. The new church will be of the Early English style of architecture, providing sitting accommodation for 600 persons, and will consist of a chancel, nave, two side aisles, organ chamber, and vestry. The cost of the structure is estimated at 6,000l. The architect is Mr. Coates Carter, of Cardiff, Mr. Purnell, of Penarth, being the builder.

**CRADLEY CHURCH, WORCESTER.**—It is reported that Cradley Church has been seriously injured by mining operations, and that Mr. J. M. Gelliburn, architect, of Kidderminster, has been called in to report thereon. It has been found necessary to rebuild vestries and make other alterations.

## SANITARY AND ENGINEERING NEWS.

**CLECKHEATON SEWERAGE.**—We are informed that the Local Board of Cleckheaton have called in Mr. V. H. Radford, of Nottingham, as consulting engineer, to report on a scheme of sewerage and sewage-disposal prepared for the Board by Mr. J. C. Haller, of Rotherham. The estimated cost of the scheme is 20,000l.

**WHITCHURCH (SOMERSETSHIRE) SEWERAGE.**—We hear that the Keynsham Rural Sanitary Authority have instructed Mr. A. P. J. Cottrell, C.E., of Bristol, to report upon a scheme of sewerage to the village of Whitchurch, within their district.

**COVENTRY WATER SUPPLY.**—The meeting of the Coventry City Council, on the 23rd ult., was largely occupied with the consideration of the Waterworks Committee's recommendation that Mr. Hawksley, C.E., be instructed to prepare plans and specifications for waterworks at Whitely. The adoption of the report was moved by Mr. Read, who said that while the population of Coventry was increasing, and a water supply of 1,100,000 gallons per day was required, the available quantity fell below the needs. They had Mr. Hawksley's word that in the Whitely Valley was to be found a sufficient supply of good water, and he urged the Council to adopt that eminent engineer's plan and make ample provision for a population of 80,000 or 100,000 persons.—Alderman Maycock seconded the adoption of the report, which was adopted, on a division, by 24 votes to 11.

**PROGRESS OF THE NEW ARTESIAN WELL IN THE CITY OF LONDON.**—With reference to the progress of the work of sinking the artesian well in Petticoat-lane, the acting engineer, on the 23rd ult., reported to the Commissioners of Sewers that during the recess the contractors had not succeeded in removing the substratum of hard stone which was met with, and which was 4 ft. thick. A large staff of men had been employed night and day, and gun-cotton and dynamite had been used, but not effectually. The contractors, however, were about to free the well entirely of water, and remove the rock by working on its surface. The depth of well was at present 172 ft., and there was 57 ft. of water in the well. Considering the difficulties of the work, reasonable progress was being made.

**DOCK EXTENSION AT LEITH.**—The Leith Dock Commissioners have, it is reported, been considering proposals for increasing the harbour accommodation at Leith. The schemes suggested involve (1) the reclamation of the shallow foreshores on the east side of the East Pier, and the construction of a dock to the north of the Edinburgh Dock, and (2) the construction of a dock on the west side of the pier and north of the marine parade, involving the removal from that quarter of the ship-building yards. A modification of the first scheme has been prepared, and is at present under consideration. It involves the deepening of the fairway, and under it there might be made available more dry dock accommodation, which it seems is urgently required. Half the sterling is mentioned as the probable cost of the new scheme.

**PROJECTED WORKS NEAR BOLTON.**—At the Public Law Offices, Mawdsley-street, Bolton, on Tuesday, Mr. Arnold Taylor, one of the Inspectors for the Local Government Board, held an inquiry into applications by the Rural Sanitary Authority of Bolton Union for sanction to borrow a sum of 4,800l. for defraying the cost of carrying out private street improvements in Great Lever (part of the No. 1 Special Drainage District of the Authority), to the sum of 400l. for works of sewerage in the rural portion of Rushworth. At the inquiry, the Surveyor to the Authority, evidence as to the details of the scheme.

**SHIPLEY AND WINDHILL SEWERAGE.**—At a meeting of the Windhill Local Board, on the 21st inst., a letter was read from the Local Government Board, in answer to the application made joint with the Shipley Local Board for the issue of provisional order constituting Shipley and Windhill a joint board for the dealing with the sewage of the two districts. In their reply the Local Government Board refer to the proposed amalgamation or incorporation of Shipley and Windhill for local government purposes, and state that they defer their decision as to the provisional order pending further information as to the amalgamation question.

**CONTEMPLATED NEW PORT ON THE SOUTH COAST.**—At a meeting of the New Romney Local Commissioners, last week, the subject of the amendment of the railway-station at Littlestone-on-sea was discussed. The railway is worked by the South-Eastern Company, but it was stated that still belongs to the company to whom the Act making the line was originally granted, namely the Appledore, Lydd, and New Romney Railway Company. The Clerk to the Commissioners stated that the South-Eastern Company have decided to acquire the branch railway by purchase, inasmuch as it is in contemplation to run a line of steamboats from Littlestone, which is in the bay of Dungeness. A line of steamers in connection with the Appledore, Lydd, and New Romney Railway Company will be outside the agreement between the South-Eastern and London, Chatham and Dover Companies. Not only is the *South-Eastern Gazette* having plans for the construction of a large landing-pier been prepared for the Littlestone Estate Company, who are virtually the proprietors of the branch railway, but the spot where it is to be commenced is marked out, and the proprietors of the Littlestone estate say the pier will be proceeded with next year.

**LECTURES FOR SANITARY OFFICERS.**—Under auspices of the Sanitary Institute, a course of lectures has been arranged for the special instruction of those desirous of obtaining knowledge of the duties of sanitary officers. The various subjects will be dealt with in a course of sixteen lectures given by well-known authorities, and will be illustrated with diagrams, drawings, and models. The lectures are a continuation of the courses previously held by the Parkes Museum, and it is proposed to repeat the course twice each year, to suit the requirements of persons preparing for the examinations of the Institute. The lectures will comprise the subjects scheduled for these Examination. The first lecture was announced to be delivered by Sir Douglas Galton on Friday, Oct. 3, subject "Ventilation, Warming, and Lighting."

**SEWAGE DISPOSAL.**—We are informed that the Local Board of West Derby have asked Messrs. Bailey, Danton, & Co., of Palace-chambers, Westminster, to advise them on the question of sewage disposal.

## STAINED GLASS AND DECORATION.

**THE NORTH WINDOW OF DODINGTON CHURCH** has just been filled with stained glass. The subject selected is the wise men presenting their offerings to the infant Saviour. The window is the work of Messrs. Joseph Bell & Sons, of College-green, Bristol.

**MEMORIAL WINDOWS IN CALTON PARISH CHURCH.**—On the 6th ult. were unveiled in Calton Church four stained-glass windows, the gifts of Sir John Neilson Cuthbertson, in memory of his grandfather and grandmother, who, with their family, were members of Calton Church for many years; of the late Mr. Neilson, in memory of his wife and daughter; of Rev. John Murray, minister of the parish, in memory of his father and mother; and of Mr. David Brown, jun., in memory of his mother. The windows were all executed by Mr. Edwards, Hooper & Edwards, Bothwell-street, Glasgow.

**MEMORIAL WINDOW AT ST. GILES'S CATHEDRAL, EDINBURGH.**—A stained-glass window to the memory of the late Mrs. Cameron Lees has just been placed in the nave of St. Giles's Cathedral. The memorial window is that above the session house on the west side of the north transept. The window—a three-light one—is divided by a tall screen into an upper and lower half, the compartments of which are filled with figures symbolical of the Christian virtues. In the upper half the figures are those of "Faith," "Hope," and "Charity," and in the lower half of "Truth," "Justice," and "Mercy." The window is stated by the *Standard* to be by Cottier, of London.



**LEWISHAM.**—A stained glass window has just been placed in St. Mark's Church, Lewisham. The window consists of three lights, and illustrates the Sermon on the Mount, with architectural canopy work over. In the tracery are figures of angels with scrolls. The work was executed by Messrs. Warrington & Co.

**BROOKLYN.**—Messrs. Britten & Gilson have in hand a mural window for the Lewisham High-road Congregational Church at Brooklyn, of which they have sent us a lithograph. The design is rather unusual in effect, consisting entirely of conventional foliage design in panels—one long panel with foliated ends in the centre of each light, and a spandrel above and below; in the long panel a scroll is intertwined for the inscription. The lower portion of each light is left plain, with diamond panes, except the border which runs round the whole.

**SOUTH KELSEY CHURCH, LINCOLNSHIRE,** has just been supplied with two memorial stained-glass windows on either side of the chancel, the gift of Mrs. M. F. Brewster of Nottingham. The windows were designed and executed by Mr. Jno. Duff, London.

**WINDOW, HOLY INNOCENTS' CHURCH, FALLOWFIELD.**—A new memorial window, which has been placed in Holy Innocents' Church, Fallowfield, to the memory of the late Mr. G. H. Gilliat, was unveiled and dedicated on the 27th ult. The window contains four pictures, illustrative of scenes in the Saviour's life, subsequent to the Resurrection, and completes the series of subjects selected for the windows in the apse of the church. The window has been erected by Messrs. Lavers & Westlake, of London.

**NEW REREDOS, ST. MICHAEL'S CHURCH, MAIDSTONE.**—On the 27th ult. a new carved oak reredos and fresco painting was unveiled at St. Michael's Church, Maidstone. The design comprises a central recess for the metal cross, and on either side two of the four Evangelists. Over these figures are canopies with delicate traceries and carved crockets, and along the top runs a carved frieze with emblematic figures. In addition to the reredos itself, the remainder of the east wall below the windows has been panelled in oak and carving. The reredos was designed by Sir Arthur Blomfield, and executed, as regards the oak carving, by Messrs. Pryer, of West Borough, and as regards the figured panels by Messrs. Heaton, Butler, & Bayne, of London.

#### FOREIGN AND COLONIAL.

**FRANCE.**—An exhibition has been organised at Valenciennes, in the rooms of the Hôtel de Ville, of the works of artists born, educated, or residing and working in that arrondissement. It includes more than six hundred works, some of them of remarkable merit.—The Société des Amis des Arts of Valenciennes has opened its thirty-seventh annual exhibition, consisting of over seven hundred works of various classes.—At Royat (Puy de Dôme) a new theatre is being built, in keeping with the general appointment of this much-frequented southern resort.—The south of France has produced numerous disasters. Among these may be mentioned the wrecking of the railway bridge at Beauchastel, on the Lyons and Nîmes line, and the overthrow of the viaduct M. Pont St. Esprit by the flooding of the fine viaduct at Lunel, also announced. This viaduct, of twenty-nine arches and 48 metres in height, was built in 1843, on the road between Paris and Nîmes.—At Bastelica, Corsica, the statue of the national hero, Sampiero Corso, has been inaugurated. The statue is the work of M. Vital Dubray.—An inhabitant of St. Hilaire has conceived the singular idea of constructing, in the cemetery at that place, a representation of the Eiffel Tower as a monument over the tomb of his parents. It is 7 metres high and surmounted by a cross! On the first platform is a statue of St. Joseph, and on a marble tablet fitted between the four main pillars are engraved the names of the persons who have suffered the misfortune to repose under this novel and absurd monument.—At Rambouillet (Seine-et-Oise) the funeral of an eminent French contractor, M. Dallemagne, has just taken place. He was well known as one of the ablest and most devoted coadjutors of many eminent Parisian architects. He worked on a great many of the principal buildings erected from 1850 to 1870, notably at the Palais de Justice, the Halls Centrales, the Châtelet Theatre, the National Library, the new Morgue, &c. He was a man of remarkable ability in his business.—It is announced that the Military Engineering Department propose to pull down the "Porte de France" constructed by Vanban at Belfort, and one of the archaeological curiosities of that town. The people of Belfort are strenuously opposing its demolition, rightly valuing it as a most interesting record of the past.—At Saint Servan, near St. Malo, it is stated that the remains of the ancient cathedral of Aleth have been discovered, which was the episcopal seat of Saint Malo, first bishop of that ancient city. The foundations of the building have been discovered, and some of the walls contiguous to the existing chapel of St. Pierre.

**BERLIN.**—We hear that the greater number of the artists invited by the Chancellor (or, rather, by the Emperor) of Germany to compete in the new "National Monument Competition," before mentioned in our columns, intend to send in a protest about the non-mention of the names of the assessing body (it being feared that William II. wishes to decide the matter according to his own views and Professor Begg's ideas), and, if it comes to extremes, to send in refusals to the invitation.

**PALERMO.**—The provisional buildings to be erected on the extensive grounds which will be occupied by the Italian National Exhibition in the winter of 1891 have been taken in hand. On a corner position of the grounds (situated near the Porta Maqueda) there will soon rise the main building, which will contain the large central hall, machinery hall, and manufactured goods section. This building will have a main frontage of 258 metres, with a depth of 80 metres. The style chosen is the so-called "Norman-Sicilian." The cost has been estimated at 521,000 lire, the construction being of iron and wood. The "Fine-arts Pavilion" will soon be commenced, this erection measuring 180 metres by 70 metres, and being in a light Italian Renaissance style. The architect in charge is Professor Ernesto Basile. The opening of the exhibition is to take place on November 1, 1891.

**NATURAL GAS GETTING SHORT IN AMERICA.**—*Industries* says that at the recent meeting of the Indianapolis Association for the Advancement of Science, Professor Orton, the Ohio geologist, in discussing the probability of exhaustion of the supply of natural gas, said that the supply is not only exhaustible, but is rapidly and surely vanishing. He urges the imperative necessity of cities and states taking action to restrict wasteful use of gas, but even the strictest regulations, he says, cannot prevent the exhaustion of the supply in a few years. Within a week comes the report of a shortage of gas more general than any previous one. At Jones & Laughlin's American Iron Works, at Pittsburgh, the men are not making full time, and at the Republic Iron Works the gas supply is short. People using their own wells are also feeling the shortage. Officials of the gas companies will not admit that the supply is in danger of exhaustion, but it is the opinion of many competent judges that Pittsburgh manufacturers will soon have to use manufactured gas, or return to the use of coal.

#### MISCELLANEOUS.

**ECCLÉSIASTICAL ART EXHIBITION AT HULL.**—In connexion with the Church Congress, which is being held this week at Hull, an ecclesiastical art exhibition has been held, including a loan collection of nearly 600 exhibits. Church plate, which has many years past formed a prominent object at these exhibitions, was represented by the communion vessels from Holy Trinity and St. Mary's, Hull; St. Mary's, Beverley; Preston-in-Holderness; Burton Agnes; St. Michael-le-Belfrey, York; Swine; Guisborough; Horden; Bagthorpe; Pontefract; and Middleton. Several private owners also contributed ancient examples from their collections. Local ecclesiology was represented by a number of drawings, engravings, and books, having reference to the churches and monastic remains of the neighbourhood, which abounds in interesting antiquarian associations. Mr. Frank lent a collection of rubbings of monumental brasses, and Mr. Peck also contributed examples of the same kind.

**ROYAL VICTORIA HALL, WATERLOO BRIDGE-ROAD, S.E.**—The autumn series of lectures at the above Hall commenced with the first of two "People's Lectures" (under the auspices of the London Society for the Extension of University Teaching), by Mr. J. D. McClure, on "Nebulæ," on Tuesday last. Next Tuesday Mr. McClure will lecture on "The Sun." The arrangements for lectures during the rest of the month are as follows:—Oct. 14, "Bees as Florists and Fruit-producers," by the Rev. Prof. Cheshire. Oct. 21, "The Colours of Animals and their uses," by Dr. W. D. Halliburton. Oct. 28, "Mountaineering," by Mr. H. G. Willink.

**THE SURVEYORS' INSTITUTION** has just announced that the next Preliminary Examination for the admission of students will be held on Wednesday and Thursday, January 21 and 22, 1891. It is proposed to examine candidates from the counties of Lancashire, Cheshire, Yorkshire, Durham, Cumberland, Westmorland, and Northumberland, at Manchester. Candidates from other counties in England and Wales will be examined in London. Notice is also given that the next Annual Professional Examinations for Land Agents, Valuers, and Building Surveyors (held under the provisions of the Charter and qualifying for the Fellowship and Associateship of the Institution) will commence on March 16, 1891. Candidates for the Professional Examinations will be examined in London only. All particulars as to days, subjects, course of examination, prizes, and scholarships can be obtained of the Secretary. Notice is also given that the next Special-Certificate Examinations (for members) in Forestry, Sanitary Science, and Land Surveying and Levelling, will be held on Tuesday, Wednesday, and Thursday, June 16, 17, and 18, 1891.

**ARCHITECTURE AT UNIVERSITY COLLEGE, LONDON.**—We have received the programme of the classes for the study of Architecture, Construction, and Modern Practice, conducted by Professor T. Roger Smith, F.R.I.B.A., at University College, for session 1890-91. Three courses of lectures are given. Course A, on Architecture as a Fine Art, divided into three terms of ten lectures each, delivered every Tuesday evening from 6 to 7.10; first lecture, Tuesday, October 7. Course B, on Architecture as a Science or Constructive Art, consists of thirty lectures, divided into three terms of ten lectures each, delivered every Wednesday evening from 6 to 7.10; first lecture, Wednesday, October 8. Course C, on Modern Practice, consists of eight or ten lectures in the first or Christmas term, delivered every Monday evening from 6 to 7.15; first lecture, Monday, October 6. Examinations will take place, and at the end of the session the following prizes and certificates will be awarded should the work done by the students at the final examination be of sufficient merit. For the best answers in either A or B, the Donaldson Silver Medal; for the second best, a prize of books. For the best set of sketches, illustrative of the work of either course, a prize of books. For the best answers to questions in Modern Practice, a prize of books. Certificates of first, second, and third-class rank will also be given to those students who may merit them by the general excellence of their answers to questions set in the examination.

**BUILDING TRADE WAGES IN JAMAICA.**—According to a recent report by the United States Consul, at Kingston, Jamaica, on the condition of that island, the working hours in the neighbourhood of Kingston are from 6 a.m. to 5 p.m., with one hour for breakfast between 11 and 12; on Saturdays from 6 to 11 a.m. In the country the hours vary considerably, but, as a rule, they are from 7 a.m. to 4 p.m., with one hour for breakfast, and the people seldom turn out to work on Saturdays. The average rates of wages paid about Kingston under ordinary circumstances are:—

DAY WORK.		a. d.
Bricklayers .....	per day	3 1½
Carpenters .....	"	3 1½
Joiners .....	"	3 1½
Masons .....	"	3 1½
Painters .....	"	3 1½
Laborers .....	"	2 1
Hire of mule and cart (or dray) .....	"	6 3
Hire of two mules and cart (or dray) .....	"	7 3½
CONTRACT WORK.		a. d.
Breaking road-metal .....	per cubic yard	1 6
Bricks, making and burning, including cost of wood .....	per 1,000 23s. 7d. to 31 s	
Brickwork (ordinary) .....	per cubic yard	8 4
Drilling and blasting rock .....	per linear foot	0 8
Excavating and throwing out earth .....	per cubic yard	0 9
Excavating and throwing out earth and removing to a distance not exceeding 80 yds. .....	per cubic yard	1 6
Excavating rocks (including blasting material) .....	per cubic yard	4 2
Painting per coat .....	per square yard	0 1½
Shingling .....	per square of 100 feet	3 7½
Walling, dry stone .....	per cubic yard	1 3½
Walling, rubble in mortar .....	per cubic yard	7 3½

Day labour rates are lower in the country districts, but, after making allowance for shorter hours, the rates remain practically the same for both country and town. In some parts artisans are very scarce, and are getting scarcer every year, and inferior men have to be employed at town prices. Wages have an upward tendency. The foregoing prices do not refer to work on estates, which is paid for at somewhat lower rates.

**THE PLUMBERS' COMPANY.**—At the Guildhall, on Monday, the officers of the Worshipful Company of Plumbers for the year ensuing were sworn in as follows:—Mr. W. H. Bishop, Master; Mr. Chas. Hudson, Warden; and Mr. Philip Wilkinson, Renter Warden. Mr. G. C. Sherrin, architect, was elected a Liveryman of the Company. The Court subsequently entertained at dinner a number of guests, including the Master of the Worshipful Company of Glaziers, and Mr. H. D. Davis, Architect of the City of London School. Sir Philip Magnus, in responding to the toast "Industrial Education," referred to the large increase in the number of students attending the plumbing classes in connexion with the City and Guilds Institute, stating that 569 students presented themselves at the last examinations held by the Institute. He said the Institute welcomed the graded scheme formulated by the Plumbers' Company for the training of plumbers, commencing at the period of their apprenticeship, and providing for examinations at three stages, preliminary, intermediate, and final,—the last entitling successful candidates to enrolment under the rules of the National Registration of Plumbers.

**HAMBLET'S "MARBLE-PORCELAIN" TILES.**—This is the name given to a method of preparing floor-tiling shown in a pattern-book sent to us by Mr. J. Hamblett, of Bromwich, which consists in laying surfaces or panels with small tiles about 2 in. square, each tile worked with a mottled face in two or more colours, so that the total effect is that of a random mosaic, the joints being little noticeable amid the irregular colouring. It is not, as the patentee claims, superior to mosaic, but it gives somewhat of the same effect at a probably lower cost.



## COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITION.

Nature of Work.	By whom Advertised.	Premium.	Designs to be delivered.
*Plans for New Cemetery .....	Melton Mowbray L.B.	20 and 10 guineas.	Jan. 30, 91

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Boundary Wall, &c. ....	Belfast Uni. ....	Young & Mackenzie ..	Oct. 7
*Drain Pipes, Coals, Sticks, & Reading Room and Assembly Hall, Wetheral, Caddie .....	Manchester Corp. ....	A. W. Johnston .....	Oct. 8
Iron Footbridge, Rualhorn ..	Gravesend and Milton Union ..	J. E. Knight .....	do.
Swedish Timber .....	J. E. Knight .....	H. W. Chataway .....	do.
*"Rebuiding" Plough Inn, Coventry ..	J. E. Knight .....	Arthur A. Stott .....	Oct. 9
*Vicarage, &c., Featherstone, York ..	Indian Milk Co. Ltd. ....	do. ....	do.
Steel and Iron Girders, &c. ....	Tynemouth Sch. Bd. ....	F. R. N. Hanson .....	Oct. 10
School Buildings, Ferry Main ..	Glasgow Corporation ..	Mr. G. A. ....	Oct. 11
Deepening Reservoir .....	Natural Gas Co. ....	Geo. Rutherford .....	do.
Deep Drain (500 yds. in length) ..	Arachly, Leeds & Bar. B. ....	do. ....	do.
Alfonsina, &c., Teachers' House, at Public School, Portlanoir, N.B. ....	do. ....	do. ....	do.
Infant School, Littleburn, near Newcastle-on-Tyne .....	Teddington Local Bd. ....	do. ....	Oct. 12
*Machinery for Sewage Disposal Works, at Public School, Portlanoir, N.B. ....	Conjunct M. M. Water ..	do. ....	Oct. 14
Repairs to Buildings, at Walsall ..	Lewisham Bd. of Wks. ....	do. ....	do.
Paving Works .....	do. ....	do. ....	do.

Those marked with an Asterisk (\*) are advertised in this Number. Competition, p. iv. Contracts, pp. iv, vi, and viii. Public Appointments, p. xvi.

## CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
New Baptist Chapel, Hased, near Poulton ..	Rev. T. Davies .....	do. ....	Oct.
*Broken Gurney Granite .....	Willesdon Local Board ..	O. Claude Robson .....	Oct.
Fire Brigade Station, Wandsworth Council Office ..	Wandsworth Council ..	do. ....	Oct.
*Barging-way Duct, Asbes, &c. ....	Greenwich Bd. of Wks. ....	do. ....	Oct.
*Drain Pipes .....	do. ....	do. ....	Oct.
Re-building Ward Bridge, Walsingham ..	Devon County Council ..	E. H. Harbottle .....	Oct.
Re-building Hartford Bridge, Peter Tavy ..	do. ....	do. ....	Oct.
*New Police Court, Wandsworth ..	Com. of H. M. Works ..	Official .....	Oct.
*Removal of Slap .....	Hampstead Vestry .....	H. Jarvis & Son .....	Oct.
*Paths, Alterations, &c., &c. Hospital ..	Carroll Union .....	Reward & Thomas .....	Oct.
New Boiler House .....	Com. of H. M. Works ..	Official .....	Oct.
*Additions to London University Buildings ..	do. ....	do. ....	Oct.
New Postal Sorting Office, Sturford ..	do. ....	do. ....	Oct.
*Coast Guard Station, Walton-on-Naze ..	Major Collins .....	do. ....	Oct.
*Baking Two Deep Pits, near North ..	do. ....	do. ....	Oct.
New Rooms for Cookery .....	Gatehead School Bd. ....	Wrightman & Wrightman ..	Oct.
School, Woodhouse .....	Sheffield School Board ..	do. ....	Oct.
New Warehouse, Newcastle-on-Tyne ..	do. ....	do. ....	Oct.
*Construction and Enlargement of Board School ..	School Bd. for London ..	Official .....	Oct.
*Thirteen Cottages at Colchester ..	Salvation Army .....	W. Gilchrist & Co. ....	Oct.

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	App. to be delivered.
*Surveyor's Clerk .....	Wm. Aden Local Bd ..	100l. ....	Oct.
*Assistant Borough Surveyor ..	Southampton Corp. ....	120l. ....	Oct.

**LORD HILL'S ESTATES.**—The Stanton Estate of Lord Hill of Hawkstone, comprising 1,217 acres, was offered for sale at Shrewsbury, on the 24th ult., in 27 lots. Stanton Farm, 181 acres, with a rental of 319l., was withdrawn at 5,000l.; and another farm of 185 acres, rent, 231l. 16s., met with no bidder. A water corn-mill, having a rental of 66l. 10s., was withdrawn at 1,075l. The freehold estate, the Hazels, comprising 483 acres, was withdrawn at 9,500l. after keen bidding, which rose from 4,000l. The Coolmoor Estate of 83 acres was bought by Mr. Corser, of Shrewsbury, for 3,000l. A freehold and fully-licensed house the New Inn, was bought by Mr. W. Hall, brewer, of Wren, for 1,200l. Hilcop Bank Estate, a freehold farm, was withdrawn at 5,400l. 0s. 11d.

**THE ENGLISH IRON TRADE.**—There is no doubt that the crude iron market is still seriously disturbed by the dispute between the Scotch iron masters and their men, but the general market is steady, and there is a considerable business in finished iron and steel. The Glasgow warrant market has been greatly excited, but its tendency, on the whole, has been upwards. Scotch makers iron is higher in price, but irregular. Middlesbrough pig has been somewhat adversely affected, but there is no increase in price compared with last week. The other pig-iron markets are also unsettled, hematite pig being the least disturbed. The demand for finished iron is well maintained, and prices are strong. The enquiry for steel rails and shipbuilding material being better, there has been a further stiffening up of values. Many factors both of iron and steel, however, are rather backward in taking orders. Shipbuilders have secured more orders. Engineers continue well employed.—*Iron.*

**SOME PLUMBING NOTES.**—The County Council for the West Riding of Yorkshire have passed a resolution to the effect that "No plumbers be engaged on work in connexion with county buildings, except persons duly registered as suggested by the Worshipful Company of Plumbers."—At the opening of the winter session of the Manchester Technical School, Mr. John Smeaton, of the Worshipful Company of Plumbers, gave an address in the Lecture-hall on "Plumbing and Sanitary Science." Mr. Smeaton said the Plumbers' Company felt that all plumbers ought to pass a proper period in the workshop, and should pass a certain time in schools such as that at Manchester. The teaching of plumbing should include the arithmetic of the workshop and some knowledge of geometry and drawing. A knowledge of mechanics, of hydrostatics in relation to syphons and water-gauges, of the action of heat and the expansion and contraction of metals of chemistry, the action of the various waters and gases upon his materials, and of machine drawing, was necessary for the plumber, and he should have some slight knowledge of electricity, as well as be thoroughly acquainted with the practical details of the work.—On the 24th ult., in the Duane Technical Institute, Mr. J. Radcliffe, R.P., member of the Sanitary Institute of Great Britain, and principal teacher of plumbers' work and sanitary engineering at the Manchester Technical School, delivered the opening lecture in the plumbers' classes connected with the Institute. Mr. Radcliffe maintained that a scientific education was necessary for a plumber. He ought to be acquainted with the sciences, especially chemistry, and he ought also to be thoroughly up in mechanics, mathematics, and geometry. Heat was another important science for the plumber. They all knew that water expanded or contracted according to the application of heat or cold respectively, and it was well that the plumber should be acquainted with what would take place in lead work from heat or cold.

**CLOCK, TOWN HALL, LOCKERBIE.**—The new clock at the Town Hall, Lockerbie, is the gift of Mr. Andrew J. S. Johnston, of Haletheath, and is by Mr. J. W. Benson, of London. The clock shows the time upon four illuminated dials, 5 ft. in diameter.

**OXFORD MUSIC-HALL.**—An order has been made in Mr. Justice Sterling's Court, Chancery Division, for the sale, under provisions of the late Mr. Morris Robert Syers's will, of the Oxford Music-hall. The property consists of one lot, comprising the music-hall, with the adjoining Nos. 18 and 20, Oxford-street, and the fully-licensed premises known as the "Boar and Castle." The vendors hold these upon a fifty years' lease, of which twenty years, reckoning from last Lady-day, are still unexpired, at ground-rents amounting to 925l. per annum. The hall, with its gallery and boxes, has a total capacity for nearly 1,200 persons. It is said to be one of the first, *en generis*, to have been established in London. If we remember aught, the premises have been totally destroyed by fire. The "Boar and Castle" tavern represents a posting-house and inn which flourished during the seventeenth century.

**LONDON MECHANICAL STUDIO.**—At No. 45, Wilson-street, Finsbury-square, E.C., an amateur class-room has been started, where are taught (practically) carpentry, cabinet-making, wood-carving, wood and metal turning, &c. The room is fitted with benches, lathes, and all the necessary tools required. Mr. T. J. Syer is the principal.

**SILICESTER.**—A correspondent of the *Times* writes:—"A discovery of the greatest interest has just rewarded Mr. St. John Hope and his fellow explorers at Silchester. In one of the houses, the foundations of which have been laid bare, the excavators came across a dry well, which, on being explored, proved quite a little museum of antiquities. Some 15 ft. down the shaft, a fine, unglazed, shaped pottery vase, about 1 ft. high, quite intact, and, curiously enough, protected by lumps of chalk built around it. The vase, which probably originally contained some precious substance, was, however, quite empty. Above it were deposited a great number of iron implements, most of which were in a wonderful state of preservation. They seem to have been the tools of a carpenter and a cooper-smith or silversmith, with some miscellaneous objects of blacksmith's work thrown in. The principal specimen is a carpenter's plane of quite modern type, although unquestionably more than 1,500 years old, three or four axes, retaining their fine cutting edges and still quite serviceable, a number of chisels and gouges of all shapes and sizes, hammers, adzes, saws, files, &c. In the smith's department may be specified a brazier for burning charcoal, quite complete, two or three anvils of different sizes and shapes, a fine pair of tongs adapted for lifting crucibles, a curious tripod candlestick lamp, or candlestick, and several other curious objects of the precise uses of which have not yet been determined."

## MEETINGS.

SATURDAY, OCTOBER 4.

Association of Public Sanitary Inspectors.—Annual General Meeting to receive the annual report, &c. 6 p.m.

MONDAY, OCTOBER 6.

Society of Engineers.—Mr. W. Santo Crispin on "Sewer Ventilation." 7.30 p.m.  
Clerks of Works' Association (Carpenters' Hall).—Paper by Mr. W. Baker. 8 p.m.  
Liverpool Architectural Society.—Opening address by the President, Mr. T. Mellard Read. 7 p.m.

TUESDAY, OCTOBER 7.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. H. Law on "Principles of Calculating Areas, Cubic

Space, &c.; Interpretations of Plans and Section. Scale, 8 p.m.  
Geographical Association.—Mr. H. Mitchell on "Greek Architecture." 8 p.m.

FRIDAY, OCTOBER 10.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. P. H. on "Water Supply, Drinking Water, Pollution of Water." 8 p.m.

## RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

12,737.—WINDOW WEDGES: R. Batey.—The window wedge clamps which are the subject of this invention are made with a wedge-shaped hook; one of these clamps is fixed on each side the window-sash, so that on coming together in shutting at the meeting rails the clamps lock each other.

16,173.—ORNAMENTING AND DECORATING CEILINGS AND WALLS: J. A. Wilson and Another.—For cells or walls of buildings, shop fronts, verandahs, &c., of coloured or otherwise ornamented, is used in section and after being painted, or lacquered, if desired.

16,173.—WATER-CLOSETS: H. Hardy.—This invention relates to a self-acting closet, the water being supplied by the person rises from the seat. The run is connected inside within an eight of an inch. This allows the water to flush basin, and in the middle the front part of the basin is a flush-hole, which allows the water to enter halfway down the basin and cut the soil away with force.

8,977.—PAVEMENT LIGHTS, GLAZED GRATINGS, &c.: J. Jacobs.—By this invention lenses are formed in the glass by their peculiar shape; they are used either with or without encaustic tiles.

10,809.—VENTILATORS: J. Jones.—This invention relates to that class of ventilators, chimney cowls, which revolve by the wind and have wings, fans, &c. inside, to increase the draught up the shaft or up the chimney. A collecting space is arranged, and the wings are caused to revolve close to the circumference of the tubular shaft.

15,414.—VENTILATORS: T. Whitehead.—It is claimed with regard to these ventilators that the exit air space being greater than usual, and the guards being specially arranged to offer no resistance to the wind, air is permitted to escape from the place ventilated with greater facility.

NEW APPLICATIONS FOR PATENTS.

September 15.—14,515, T. Cobby and W. Elm, Manufacture of White Lead.—14,592, E. Hill, Exporting Window Sashes.

September 16.—14,597, T. Carr, Window Sashes. 14,624, W. & C. Martin, Convertible Window Sashes. 14,625, J. Baker, Locks. 14,728, R. Haigh, Disinfecting Closets. 14,763, J. Hird & J. Ford, Casement Sash Windows, &c.—14,766, R. Hadden, Windows with Horizontal Sliding-sashes, and Lock or Fastener same.—14,774, A. Glover, Paving Composition.

September 19.—14,790, S. Hill, Adjusting the position of Swing Mirrors, Windows, Ventilators, &c.—14,791, J. Seagr, Ventilators.—14,830, F. Walton, Accommodating Electric Wires in Buildings.

September 20.—14,850, W. Edwards & W. Hibbitt, Spring Hinges.—14,853, A. Pomfret, Current Regulator for Ventilation.—14,877, L. & S. Swale, Syphon Glass for Water-closets.—14,897, J. Brodie, Substitute for Decorative Tiles for Furniture, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

3,482, A. von Solemacher-Antweiler, Bricks, Tiles, &c.—7,312, E. Baudry-Diot, Bridges.—10,610, E. Slat, Preventing the Steaming of Shop Windows.—10,611, J. Baker, Locks.—11,663, J. Birchmore, Portable Ornamental Iron Railings.—11,927, W. More, Door-knob Attachments.—12,107, W. Worsam, Scrubbing.—12,478, S. Bromhead, Flexible Coverings for Floors.—12,599, J. Brodie, Windows.—12,765, E. Gregory, Blocks for Flooring.—12,922, G. Helmore, Window-sash Fasteners.—13,171, W. Sturges, Door Locks and Fasteners.—13,172, H. Barker, Fire-plate for Doors.—13,643, J. Ball, Clough, Closets, &c.—13,699, F. Berry, Electric Bell Gongs.—13,745, G. Willcock, Fastening for Window-sashes.—13,764, H. Sutcliffe, Lavatory Wash-basins.—13,893, J. Brayley, Ventilation.—13,907, J. L. Latches.—14,153, J. Macdonald, Ventilating Sash Joints or Astragals.







**LUTON.**—For constructing a service water-tank, and providing and laying two cast-iron water mains, at Luton, Bishopscleepton, Devon, for the Newton Abbot Union Rural Sanitary Authority.  
Mr. Saml. Seger, surveyor, Union-street, Newton Abbot.  
Garton & King..... £245 0 0 Parker Bros..... £420 0 0  
A. Best..... 485 0 0 Robt. Hall, Bedford..... 494 10 0  
W. J. T. Madden..... 497 0 0 Chudleigh (accepted) 383 4 0

**NEWCASTLE-ON-TYNE.**—For alterations, &c., to premises, 33, Grainger-street, Newcastle-on-Tyne, for Messrs. Thomson & Macrae.  
Mr. J. Ernest Stout, architect, Commercial-chambers, South Shields.  
Type & Graham..... £269 8 0 Edward Weatherley..... £250 3 0  
John Brooks..... £62 15 0 James Smart..... £99 0 0  
Alex. Pringle..... £65 0 0 Thomas Weatherill..... £94 10 0  
John Jackson..... £55 0 0 Newcastle..... Accepted.  
Hawell & Waugh..... £45 0 0

**Steam Cooking, &c.**  
Benham & Son..... £490 0 0 Emery & Son, New.  
Dinning & Co..... £29 13 6 Little (accepted)..... £219 15 8

**PONTYFRIDG.**—For the construction of a row of 131 chains in length, at Clydach Vale, near Pontyfridg, for the Cambrian Building Society.  
Mr. R. S. Griffiths, architect, Glyn Cottage, Clydach Vale, near Pontyfridg.  
W. Willis..... £330 0 0 T. Williams, Bryn.  
T. Morgan..... 308 1 11 (accepted)..... £293 7 0

**RICHMOND.**—For new outfall sewer, across Richmond-green, for the Richmond (Barrow) Urban Sanitary Authority. Mr. Walter Brooks, C.E., Town Surveyor, Lower Whitechapel, Richmond.  
W. J. Collier..... £2,350 0 0 J. W. T. & Co..... £50 0 0  
Leonard Bottom..... £4,750 0 0 J. W. T. & Co..... £50 0 0  
Cook & Co..... £672 0 0 J. W. T. & Co..... £50 0 0  
A. Kellist..... £48 0 0 J. W. T. & Co..... £50 0 0  
W. De Wain (accepted)..... £84 0 0 J. W. T. & Co..... £50 0 0  
Nave & Son..... £922 4 4 J. W. T. & Co..... £50 0 0  
Nowell & Rolson..... £721 0 0 J. W. T. & Co..... £50 0 0  
Tombs & Wimpsey..... £,681 0 0 J. W. T. & Co..... £50 0 0  
(Surveyor's estimate, £5,150.)

**ST. AUSTELL.**—For the renovation and addition of the Bible Christian Chapel, at Bagle, St. Austell. Mr. F. C. Jury, architect, Truro-street, St. Austell.  
Taylor & Son, Joint Tender..... £675 0  
W. H. Smith, Carpenter and Painter..... £23 10  
R. Tuthway, Carpenter and Painter..... 385 0  
T. J. Smith, St. Austell, Carpenter and Painter (accepted) 377 10  
J. Stourbridge, Carpenter and Painter..... 310 0  
J. Jacob, Vannor, St. Austell, Carpenter and Painter..... 24 10  
Jonathan Vannor, Bagle, Cornwall (accepted)..... 385 0

**SANDHURST.**—For the construction of a covered reservoir at Sandhurst. Mr. W. H. Radford, engineer, Sandhurst.  
J. Hawley & Son..... £1,250 0 0 H. Vickers..... £287 0 0  
J. E. Price..... £50 0 0 J. T. & Co..... £84 0 0  
D. Smith..... £45 0 0 J. T. & Co..... £84 0 0  
W. E. Shaw..... £45 0 0 H. Vickers..... £87 5 0  
A. Fankler..... £45 0 0 H. Vickers..... £87 5 0  
J. Hodson & Son..... £19 0 0 G. F. Todd (accepted) 720 0 0

**SHIRLEY (Hants).**—For additions and alterations to police-station at Shirley, Southampton, for the Hants County Council, St. James Robinson, County Surveyor, 15, Southgate-street, Winchester.  
T. Ware..... £148 0 0 H. Vickers..... £49 10 0  
Crook & Son..... £57 0 0 H. Vickers..... £49 10 0  
Cawte..... £76 0 0 H. Vickers & Co., Exmouth.  
C. Barker..... £721 0 0 road, Southampton..... £48 10 0  
W. Franklin..... £65 0 0 A. Warden..... 399 0 0  
\* Accepted.

**STAPLEFORD (Nottingham).**—For laying in water-mains at Stapleford & Sandlauer. Mr. W. H. Radford, engineer, Nottingham.  
J. Hawley & Son..... £1,250 0 0 H. Vickers..... £287 12 0  
D. Barry..... £79 15 0 G. F. Todd..... £44 0 0  
H. Shadlow..... £61 15 0 J. F. Price (accepted) 480 0 0  
J. Tomlinson..... £88 0 0 A. Fankler (later)..... 485 0 0

**TWICKENHAM.**—For additions, &c., to High Spot House, Twickenham. Messrs. John Lees & Burdell, architects, Watford.  
Wright Bros..... £709 18s 6d (accepted)..... £298  
Street & Loder..... 647

**WATFORD.**—For new schools in Watford-fields, for the Watford School Board. Messrs. Ayres & Arden, architects, Watford.  
London.  
Wage..... £1,687 10s 6d (accepted)..... £1,687 10s 6d  
Julke..... £1,687 10s 6d (accepted)..... £1,687 10s 6d  
McCrack & Co..... £1,687 10s 6d (accepted)..... £1,687 10s 6d  
Miskin..... £1,687 10s 6d (accepted)..... £1,687 10s 6d  
Andrews..... £1,687 10s 6d (accepted)..... £1,687 10s 6d  
\* Accepted at £1,840, subject to reductions.

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#### TO CORRESPONDENTS.

"C. E. E.," who thinks, but not of sufficient interest for publication.—E. P. (it is impossible for us to review competition drawings until we are informed that they are publicly exhibited).—H. (it is impossible for us to review private drawings until we are informed that they are publicly exhibited).—We have received no intimation of any exhibition of the designs you refer to.—W. S. & Son.—H. (shall have attention).—F. A. & Co. (next week).  
All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication. We are compelled to decline pointing out books and giving addresses. Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.  
We cannot undertake to return rejected communications. Letters or communications (beyond news-items) which have been duplicated for other journals, are NOT DESIRED. Communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY, but those intended for the front page should be in by TWELVE noon on WEDNESDAY.

**SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS OR ORDERS TO DISCONTINUE SAME** must reach the Office before TEN o'clock on WEDNESDAY morning.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

**PERSONS** advertising in "The Builder" may have Replies addressed to the Office, 46, Catherine-street, Covent-garden, W.C. Free of charge. Letters will be forwarded if addressed in envelopes are sent, together with sufficient stamps to cover the postage.

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Oak Dadoes, " 1s. 6d.  
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Oak, 1 inch Parquet Floors, laid and polished, from 27. 10s. a square.  
Solid 1-inch Oak, straight boards, laid and polished, at 26. 18s. a square.  
Solid 1-inch Oak Parquet for covering Deal floors, laid and polished, from 25 a square.  
Oak Wood Tapestry Dadoes, from 1s. per foot super.  
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Ditto with Carved or Painted Panels, prices according to sketches.

Prices given for all Interior Work, Doors, Architraves, Over-doors, Chimney-pieces, Stoves, and Hearths. Architects' and Surveyors' attention particularly called to the above Quotations for

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Prices, and every information given, on application to CHARLES TRASK & SONS, Doulting, Shepton Mallet.

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The attention of Architects is specially invited to the durability and beautiful colour of this material. Quarries well opened. Quick despatch guaranteed. Stonework delivered and fixed complete. Samples and estimates free. Address, The Ham Hill Stone Co., Norton, Stokely-under-Ham, Somerset. London Agent: Mr. E. A. Williams, 16, Craven-st., Strand, W.C. [Adv.]

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### The Architectural Exhibition, Turin.



THE first general exhibition of architecture held in Italy was opened at Turin on September 28 last, as incidentally mentioned in our columns. Among the Italian architects a great deal of interest and enthusiasm seems to have been aroused in regard to this exhibition, which has been planned on a very extensive scale, and is regarded in Italy as a demonstration of the achievements and powers of modern Italian architecture; and we might before this have had in our hands more than one account of the exhibition, "written in very choice Italian" and inspired with the glow of patriotic fervour. English readers, however, will be more interested to know how the exhibition appears from an English than from an Italian point of view; and we preferred, therefore, to postpone any detailed comment on the collection till it could be specially visited from England.

Considerable pains have been taken to make the exhibition thoroughly representative of the artistic side, at least, of Italian architecture, both mediæval and modern. The more ancient work of classic times is but slightly shown, with the exception of that of Pompeii. The building in which the exhibition is located is that erected some few years since for the exhibition of Italian painting and sculpture, but the façade has been decorated to make the building especially expressive of its immediate purpose. In the centre of the façade is an Ionic tetrastyle portico, with pediment over, the detail and colouring being Roman, or, more strictly, Pompeian, rather than Greek. The columns, which are without flutes, are painted dusky red for the lower third of their height and yellow above, the capitals being principally white, picked out with red, yellow, and blue; the bases are painted dark green, and the entablature is white with two lines of red on the frieze, and one cyma below it, painted blue. The egg and tongue enrichment and fret on the soffit of the corona are painted only, not carved, the whole of the façade being executed in stucco. Above the pediment rises, slightly in the rear, an attic inscribed in painted letters with the

word "Architettura." The walls flanking the portico are painted dark red, and are quite plain, except the cornice, which continues that of the portico and is similarly treated. At the angles are the words "Ars" and "Labor," one on each side, and a certain amount of decoration is given by two ornamental sockets to support the flag poles; these have as part of their design female winged figures of heroic size, with laurel wreaths and palms of victory. The sockets and figures are boldly and somewhat roughly modelled in stucco, and coloured to imitate bronze.

The plan of the building is simple, and well adapted for the purposes of an art exhibition. Passing through the tetrastyle portico we enter the first of a series of eleven top-lighted galleries; on the right of these, and occasionally communicating, are ten more top-lighted rooms, while on the left are two side-lighted galleries, separated by a central pavilion, which forms the entrance to the grounds, and affords space for a café and restaurant. The exhibition building is in the public gardens on the banks of the Po, in a picturesque situation, and is easily reached by tramcar.

The general arrangement of the exhibition to a considerable extent lacks system and order, the original scheme of the grouping having apparently been interfered with by irregularity in the reception of the various objects exhibited; in fact, some important additions were made during the stay of our special correspondent at Turin. The catalogue, too, is not yet ready; and though advertised to be held for the months of September, October, and November, the opening of the exhibition was only at the end of September, as already mentioned, and it therefore suffers somewhat from the general tardiness.

The original idea of arrangement seems to have been to locate modern Italian architecture in the central range of galleries, excepting the middle one (No. 6), which is devoted to the exhibition of old work, grouped according to the various districts of Italy, and the two end galleries, which were evidently intended to receive examples of internal decoration. The right-hand galleries are mainly devoted to sketches, photographs, and publications; the left-hand galleries to municipal exhibitions, both native and foreign. The original idea has, however, not been

strictly adhered to, various departments have overflowed into the space of others, while late arrivals have been utilised to fill up gaps, independent of their proper place. Thus, for example, while several of the competition drawings for the Houses of Parliament at Rome are hung together, others are found singly in various parts of the exhibition, rendering comparison naturally somewhat difficult. The galleries are subdivided by screens, to give increased wall space, which is, of course, of the highest importance in an architectural exhibition, and particularly in Italy, where it is the custom to make competition drawings to the large scale of  $\frac{1}{2}$ , even for large monumental buildings, with details to  $\frac{1}{16}$ . The drawings are certainly not spread out, but are, on the contrary, rather crowded, so that many that are hung considerably above the line are not seen to advantage.

After an examination of the works of modern Italian architects, from the drawings and photographs of executed designs, we very forcibly realise the importance attached in Italy to the calling of an engineer and to the scientific side of the profession. An *architetto* is one who has not sufficiently advanced his education to enable him to earn the more honoured title of *ingegnere ed architetto*, which is borne by all leading members of the architectural profession in Italy, and is the aspiration of the architectural student. Hence we see that, in competition designs, the drawings of the foremost men show carefully the ironwork, especially of the construction. This exaltation of the engineer probably accounts in a considerable degree for one of the predominant characteristics of much of modern Italian architecture; the estimation of architectural design as merely the clothing, more or less well fitting as the case may be, of the building, and not, as it should be, the vital essence of the whole structure. The engineering construction is not simply the articulation of the body, but the body itself.

This characteristic is, possibly, also largely developed by two other important factors in the history of modern Italian architecture; first, the extensive use of stucco for the formation of architectural features and decoration, and, second, the intensely eclectic character of modern Italian architectural design. The use of stucco,—in which, it must



be granted, the Italian workmen are experts, both as regards the durability of their workmanship, and their skill in modelling wet plaster *in situ*, naturally leads to dislocation in the construction of the building; first the *ingegnere* designs and superintends the erection of the framework, the walls, floors, and roof; then the *stuccatore*, with the design and superintendence of the *architetto*, clothes the framework with its architectural adornment. Nor does the union of the *ingegnere* and the *architetto* in the same man compensate sufficiently for the mischievous tendency to separate construction and design, which appears so prominent in this exhibition. We must, however, not omit to notice that there is among some of the younger men, especially the students of the Milan School of Architecture, like Sommaruga (whose design, in conjunction with Luigi Broggi, for the new Houses of Parliament in Rome, was illustrated in the *Builder* of the 20th ult.), a manifestation of a more healthy spirit of architectural design. Some of these men are evidently architects, in the best and fullest meaning of the title, and uniting thorough knowledge of construction with that of the vital principles of architecture, produce designs which have that essential unity of conception that can alone be accepted as true architecture. The exceedingly eclectic character of modern Italian architecture surpasses even that of contemporary English work. Not only are different styles adopted by different designers, but in the work of each individual, there is seen, very frequently, an attempt at the expression of architectural ideas in widely dissimilar dialects. Thus, for example, among the drawings exhibited by Gaetano Moretti, of Milan, whose premiated design for the new Houses of Parliament was also illustrated in the *Builder* of the 20th ult., we find, besides the originals of the design just referred to, a photograph of an executed design for a church façade in the Rococo development of Renaissance usual, known as the Jesuit style, a design for a cemetery in a Byzantine manner, sketches for altars in late Italian Gothic of florid, ornate, and restless character, though exhibiting a great wealth of invention; several sketches for the façade of Milan Cathedral, with photographs of the completed designs, which are, of course, designed to harmonise with the Germano-Italian Gothic of the existing building; several sketches for tombs and mortuary chapels, some Greek, some Renaissance, one in French fourteenth-century Gothic, others in sculptural treatment. Moretti also sends designs and photographs of furniture, chiefly in Rococo and Baroque style, but excellent designs for the style, sketches for ewers and paten, showing an ability and versatility of idea that mark the genuine artistic impulse of the man.

Unfortunately, the eclecticism of which we are speaking is not confined to the adoption of various styles for separate designs, but occasionally in the same design we find an attempt to unite features borrowed from various periods, especially of the Renaissance, which too often leads to incongruities that detract from artistic effect. Without yielding entirely to the views of straitlaced and puritanical or academical architectural purists, it is sufficiently obvious that an attempt to combine detail of varied forms of architectural expression requires, if failure is to be avoided, a very nice sense of judgment and fitness in the selection of the component parts,—a sense that, in spite of the inheritance of good taste to which we might suppose the modern Italians were heirs, is occasionally absent in their architectural design. This demerit, however, it is but fair to say, is not universally, or even generally, found in the work of modern Italian architects, especially in that of men of the calibre of Moretti and Sommaruga. Eclecticism of style in Italy appears to be, to a certain extent, limited by a somewhat conventional appropriation of various styles to particular uses; thus, without any rigidity of selection, Greek, Romano-Gothic, or Byzantine appear to be the

favourite styles for cemeteries; Italian Gothic and Romanesque for churches; some form of Mohammedan art for Jewish synagogues; and various phases of Renaissance, according to the individual caprice of the designer, for public buildings, residential and business premises.

Together with eclecticism of design, there are among the modern Italians many varied forms of expression in drawing; the pencil, the pen, and the brush all finding their use in different hands. As compared with modern English draughtsmanship, there is nothing to equal the work of our best men with pen or pencil; the brush, on the other hand, is far more generally and more skillfully used. We may safely say that there is not a single drawing in pen or pencil in the whole exhibition which would give the draughtsman the faintest possible chance in the annual competition for the Soane Medallion or the Association Travelling Studentship; with the brush, however, there are very few of our students who could successfully compete with those of the Milanese school. In competition drawings, perspectives, though occasionally used, are rare; highly and realistically coloured elevations, with shadows accurately projected in the French manner, skies, back-grounds, and accessories taking their place. As compared with French draughtsmanship, the Italian work lacks refinement and delicacy of shading, but has instead very frequently a power and vigour of effect gained by strong contrast and the skilful use of accidental shadow. The varied methods of draughtsmanship in elevations may be thus described:—Drawings in pen-and-ink line entirely, including the shadows and window-openings; this is, to an English eye, very inferior in effect, and is particularly liable to degenerate into scratchiness, or what is, in our student argot, called "flick and dot"; various depths of tone are obtained by the use of ink of varying strength of blackness, but the method can hardly be considered a success, and usually accompanies second-rate design; then pencil-drawings in line, with faint tints of colour for the general surfaces, shadows, and voids; this is usually refined in effect, but frequently looks weak in competition work when opposed to more strongly-executed drawings; this method is often found as the expression of an academical character of design. More strongly-tinted drawings, either over pencil or ink lines, come next; these are finished either in monochrome or polychrome, and form the large majority of competition drawings; those in monochrome are frequently carefully finished, while the polychromatic examples aim rather at a picturesque effect. Lastly, we have the strong forcible methods of the younger men, especially of the Milanese students, in which monochrome or polychrome are handled with an extreme vigour of effect, which might readily descend to vulgarity if used by less consummate artists than Moretti and Sommaruga, and others of their fellow students, whose work we shall have occasion to notice in speaking of students' work. Sketch-designs are usually made in pen and ink or pencil, and never omit to give some indication of the shadows; they are usually made, it appears, with extreme rapidity, aiming at general effect rather than at detail, which is vague and indistinct. By students and the representatives of the older style, sketches are made in elevation for the most part; by many of what we may call the new school, of which the Milanese students are the great examples, sketch designs are made frequently in perspective, though not entirely so. Drawings of old work, made for the purpose of study, by students, are but poorly represented. The careful and thoroughly worked-out measured drawings, which we are accustomed to see in England, are absent. Measured drawings are few and far between, and appear chiefly to have been prepared for the purposes of book-illustration or for official records of historic monuments. Nor are free-hand sketches much more numerous, save for some few instances, such as the excellent

collection by Professor F. Mazzanti, of Rome, chiefly of detail and "bits;" these are mostly in pencil, some in ink slightly tinted, except the examples of coloured decoration, which are, of course, of full strength. Even this example suggests the collection of a professor rather than the studies of a practitioner. Sketching old work must, naturally, appear somewhat of a waste of time to the student, who is deluged with the productions of the enterprising publishers and skilful photographers, who, both native and German, cater so largely for the continental student. That this is the cause of general lack of sketching study of old work is strongly emphasised by the fact that, what the men who do sketch mostly fancy is the early ecclesiastical work, which has been less fully illustrated by publications of phototype and other methods than the Renaissance work of civil and domestic character; hence sketching is the resource of the young church architect, or else is mainly a study of colour, either in decoration or as the accidental effect of time and weather.

Having thus summarised the chief points that command our attention in modern Italian architecture, we shall notice how these are especially exemplified in some of the most important work exhibited, and we shall call attention to the methods of solving some of the various problems daily presented to the profession by our Italian confrères in dealing with the design of edifices for particular purposes.

In an exhibition of professional work of the extent now gathered together at Turin, it must be sufficiently evident that the weaker as well as the stronger side of Italian modern architecture is presented, and we should therefore be careful to select for consideration and criticism, in any attempt to fairly gauge the position of Italy in art, the work of the leading and most prominent men.

As an example of the work of a leading man we may take the design for the new Law Courts at Rome, by Guglielmo Calderini, Professor of Architecture and Construction at the University of Pisa, which is shown in a series of elaborate drawings to the scale of  $\frac{1}{8}$ , which nearly corresponds to our scale of 4 feet to an inch. The principal façade has for its *ordonnance* three orders, Tuscan, Doric, and Ionic, in successive stages, treated with single columns engaged and planted on to the face of wide pilasters except to the angle pavilions, where the columns are coupled. The orders, with their horizontal lines, are continued round the flank and re-elevations, where they enclose two floors, the upper being a mezzanine, the windows of which are omitted on the front, it results that, in the principal front, the windows, which range with those on the flanks and are of similar detail, have above them a blank wall space which appears to crush the openings. In the centre of the composition of the principal front a great arch entirely fills the height of the upper order, and under this are coupled columns, capped with a broken pediment crowned with figures. This use of a gigantic arch for the central feature of a design seems to be a favourite device of modern Italian architects and frequently, indeed usually, spoils the scale of the remainder of the design. An example of the abuse of this feature may be seen in the design of Broggi and Sommaruga for the Houses of Parliament (*Builder*, September 20 last). The detail of the design we are considering shows a good acquaintance with the work of the past, being largely based on the style of Michelangelo and his contemporaries. The side elevations, which embrace two orders only, are decidedly the most pleasing, as here the lower order, which is rusticated throughout, assimilates with the basement, which is also rusticated, to form a substantial substructure for the upper order, which rightly is made the principal in richness and grace of design, without crushing the lower portion of the façade, which holds its own by virtue of its superior height and strength. In the principal front there appears to be no dominant part, and the rusticated portion looks too weak for the



superstructure, an impression which is intensified by the fact that the entablature of the lowest order is cut through to provide the height given to the large semicircular-headed openings of the entrances, the cornice only being a continuous horizontal line. The rusticated ground-floor assimilates with the basement, and thus looks too high for a subsidiary portion of the design, while at the same time it is too low for a principal story. The angle pavilions, which as before mentioned have coupled columns, are crowned with a blank attic, but neither this nor the blank wall space, owing to the manner of its disposition, are able to give repose to the design, a quality which is lacking throughout, although it should, doubtless, be an essential point of the design of a monumental building of this character. There is also a certain amount of incongruity in the combination of the Late Renaissance detail with the rigid classicism of the orders employed. The elevations are shown in heavily-shaded monochrome of cold brown tint, which, however, does not give the necessary dignity to the drawing. The whole design shows a knowledge of the detail of the past united with a lack of the true principles of design which is, we fear, but too characteristic of much of the work of modern Italian architects.

Another design by Calderini, for the national monument to Victor Emmanuel II., although not submitted in the actual competition, is nevertheless one of the happiest conceptions for this work illustrated in the exhibition. Too many of the designs place the statue of the monarch in an isolated position, with an architectural background too far in the rear; that by Calderini emphasises the statue, and at the same time brings it into connexion with the remainder of the design by setting it in a semicircular-domed apse, treated with a colonnade, which is continued to segmental bays on either side, the whole standing upon an acclivity approached by an imposing flight of steps. The design is spoilt by the introduction of a meaningless range of Corinthian columns, carrying nothing, connected by a band of masonry at about two-thirds the height of the shafts, carved with a weakly-designed ornament of festoons. These columns are intended to mask the exterior of the roof of the semidome, but are evidence of an impatience which did not permit the designer to grapple carefully and successfully with what, it must be granted, is a somewhat difficult problem to solve. Almost any other solution would have been preferable, even to leaving the roof of the dome in its bare simplicity. This design is shown in drawings finished in a warm sepia tint that is highly satisfactory.

The design by Professor Gherardo Rega for the same subject shows the statue in the open with a semicircular colonnade in the rear, reminding us of the colonnade of old Burlington House. The composition is placed upon high ground, approached by numerous steps, and the design is best described by the term "academic."

Another design for the Victor Emmanuel monument, and one which received a silver medal in the competition, is that by Pietro Berti, of Florence. This in the centre has a Roman triumphal arch, closely resembling that those of Constantine and Septimius Severus would be if the side arches were filled with masonry, having statues in front. The centre of the composition is flanked by straight colonnades, with a straight-lined attic over, and stopped by solid pedestals. The attic is sculptured, but is too high for the colonnade on which it is supported. The approach is made by a series of winding and returned steps, and the whole design is less overdone with figures, and is far more satisfactory than the majority, being much quieter and more restful in character. The statue, however, is too much isolated in position. It is remarkable that, among a people so attached to the theatre as the Italians, the designers should have failed to recognise the necessity for an intimate connexion between the scenery and the actor, between the statue of the King and the architectural background.

There are many other designs for this competition exhibited, but the majority follow closely the lines of those by Rega and Berti just described, and a full description of all would be tedious and a waste of space.

We may, however, mention that by L. Boffi, which differs entirely in *motif* from those already mentioned, and is besides one of the best examples of pen and ink drawing in the exhibition. Here the design takes the form of a square central tower, surmounted by a figure of Victory with laurel wreaths, and flanked by wings at a much lower level, decorated with sculptured subjects, the import of which is denoted by the superscription, "Sant. Martino," the famous battle, and "Unita Nazionale," the ever-memorable scene, to Italians, in the Parliament House. The figure of Victor Emmanuel is in the foreground, an equestrian statue, somewhat eclipsed by the monument, which is rather too important to form an appropriate setting or background to the central figure; this latter, indeed, is hardly more than a decorative accessory to the composition, of slightly greater weight than many of the other sculptured emblematical figures. The draughtsmanship is admirable, especially the way in which the sculpture is indicated, and the effective shading, which is free from rigidity and stiffness. These particular drawings show one strong point of many modern Italian architects,—the design of detail and accessories, especially in the free style of the Late Renaissance,—a point on which we shall have occasion to touch still further in continuing the subject in a future article.

#### NOTES.



WE observe with much interest that our Australian relatives are exhibiting in that quarter of the world the passion for exploration which may be said to be an hereditary quality of the English race. From a communication in the *Times* of Tuesday, we learn that the wealthy and large-minded colonist Sir Thomas Elder (whose portrait bust by Mr. Woolner we illustrated a short time since) has offered to furnish all the money necessary for a great exploration expedition into the centre of the Australian continent, on condition that he is satisfied with the scheme of such expedition, to be submitted to him beforehand. In a letter addressed to Baron von Müller, and read before the Royal Geographical Society of Australasia, at their meeting on August 29, he says in regard to the enterprise:—

"I have already referred to the importance of finding a thoroughly competent leader, as upon that much of the success of the expedition will depend. He ought to be a man not merely of pluck, courage, energy, influence over his men, but possess all the required physical qualities, and of such scientific attainments as will enable him to report advantageously on the topographical, geographical, botanical, geological, and other features of the tracts of land which he may travel over. But I need not expatiate at length on this branch of the subject, as no one knows better than yourself the special qualifications required by the conducting of such an expedition, if it is to be thoroughly successful. What I would like you to do is this,—viz., to intimate to the Melbourne exploration and geographical societies, and to the kindred societies in the Australian colonies, 'that I am willing to bear the entire cost.' Let a scheme be carefully prepared in concert with the best experts for the final important work of Australian land exploration, and transmitted to me, when, if approved, I shall immediately take steps to have the scheme realised at my own expense."

That Australians would not allow themselves to be beaten by the difficulties of inland exploration, or allow the interior of their continent to remain for ever a trackless desert, we have always felt sure. But what perhaps is of even more interest is the effort which is being made in connexion with the same Society for further Antarctic exploration. Baron A. E. Nordenskjöld, an Arctic explorer of note, has consented to take the command of an Antarctic expedition if the Australian colonies contribute a sum of 5,000*l.* towards the expenses. We could

have wished that the Australians could have found a leader among themselves. England led the way under Cook in Antarctic exploration; it would be a fitting thing that it should be resumed by those of English race who are now so much more conveniently situated, geographically, for getting at the Antarctic region. But we wish success to the expedition, when formed, under whatever command.

WE print in another column an appeal from Mr. Penrose for funds to enable the architectural students of the British School at Athens, Mr. Schultz and Mr. Barnsley, to carry out the examination they are commissioned to make of the Byzantine buildings recently destroyed by fire at Salonika. We hope Mr. Penrose will obtain some substantial response to this appeal. It is of the greatest importance that trustworthy details should be obtained of the work before it is further destroyed, for all archaeological purposes, by restoration.

THE latest phase of the strike in the shipbuilding trade (to which we have before alluded) is the acceptance by the Mayor of Newcastle of the position of mediator. Although a comparatively small affair at the commencement, this strike caused a great deal of friction in the trade, which has kept on extending, and it is still far from certain that a general strike of shipbuilders will not take place before the questions in dispute are settled. A large number of men have gone from Plymouth and elsewhere to take the place of the Tyneside strikers, and this importation of strangers has intensified the irritation among the disaffected. The plan proposed by the Mayor of Newcastle is that a Board of Conciliation should be formed, representative of all the trades engaged in the shipbuilding yards, with full power to deal with the present dispute. The success of this scheme depends upon whether both the shipwrights (who accepted the original award made by Mr. Burt) and the joiners, who struck against it, will agree to the proposal. It is stated that Mr. Burt was occupied for some months in taking evidence as to the practice of the trade, &c., so that his award was not given without good grounds; but it is certainly possible that a Board constituted in the manner proposed may arrive at a more equitable decision than a single individual. A necessity seems to have arisen for permanent Conciliation Boards to be established in all large industries, together with a central body to whom matters may be referred which the local Boards fail to adjust.

THE Architectural Association *soirée*, held in the Westminster Town Hall on Friday, October 3, to which we called attention in our last issue, certainly put all its predecessors into the shade. An energetic Entertainments Sub-Committee, with the help of a courteous band of willing exhibitors, transformed the large hall into a luxurious reception-room, where the guests were received by the President, Mr. Leonard Stokes, and the Committee, and where refreshments and the band of the Coldstream Guards contributed to the entertainment. The large hall and staircases were fitted up with electric light by Messrs. Rashleigh, Phipps & Dawson, the current being obtained from the Westminster Electric Supply Corporation. The Association ask us to express their acknowledgments to the following firms, who contributed greatly to the general effect by exhibiting choice specimens of their manufactures, exemplifying the arts and crafts connected with architecture:—

T. Bontor & Co.	Hayward & Son
Collinson & Lock	Hindley & Sons
Dockrell & Co.	Jaffrey & Co.
D'Oyly & Co., Limited	Morris & Co.
Felix & Wayman	Pittman & Son
Fisher & Co.	Rottman, Strome, & Co.
Gillow & Co.	Thomas Wardle
Graham & Biddle	Woolmans & Co.
Gregory & Co.	

An interesting collection of Class prizes and other drawings was exhibited on the first—



floor. The illustrations of Hypnotism in the Council-chamber, by Dr. George André, excited great interest and large audiences. The professional value of Hypnotism soon became apparent to all, for might not its influence be utilised in smoothing the anxieties of an architect's existence in convincing a client at the right moment that the plans before him really were what was best for the purpose, and the tenders received rather below than above the sum originally mentioned? There is yet time for "Hypnotism as applied to Clients" to take its place beside Professional Practice in the new Scheme of the Association, and we place the suggestion entirely at the Committee's disposal. The evening seems to have been a great success.

MR. ST. JOHN HOPE contributes to the October number of the *Antiquary* a short account of the recent excavations at Silchester. In one portion of the site have been found two large detached rectangular pieces of building filled in with clay and sand as if to form raised platforms for large buildings. There are indications of wall veneers of polished Purbeck marble, and the external walls were plastered and painted. Of the various small objects found, pottery and bronze and iron implements, the more important will probably be exhibited at the Society of Antiquaries' rooms when it resumes its meetings in November. Mr. Hope observes that such work cannot be carried on without money, and hopes that everyone interested in Romano-British archeology will send some contribution, however small, to the Treasurer of the Silchester Excavation Fund, Mr. F. G. Hilton Price, 1 Fleet-street. He adds that visitors to the site may depend on finding some of the Executive Committee on the spot, who will give them every information.

THE Dean and Chapter of Ely Cathedral set a good example to similar bodies by supplying visitors to the choir with a leaflet, on one side of which is a ground-plan of the choir, with numerals to indicate the monuments, and on the other the explanation of the figures, and a few brief notes as to the architecture of this part of the building. Such leaflets should be obtainable at all our cathedrals, for visitors do not want to be turning over the pages of a guide-book or architectural hand-book, as they move from one part of the building to the other, but such a leaflet indicates in a convenient way for the moment the features of the building. It is doubtful, in some respects, how far the natural curiosity to know to whom this monument was erected, and by whom that was placed in the building, should be gratified in a short account of this kind. The attention to often immaterial details tends to take away the thoughts from the main features and characteristics of a building, which are sufficient for the mind of most visitors. But, on the other hand, this same body should provide some seats outside this vast building. There is not one single seat on which a person can rest. It is essential that the external part of a building such as Ely Cathedral should be studied without haste, and it is most fatiguing not to be able to take a rest in the course of one or two hours' inspection of the building. There are many places perfectly suitable for such seats, and it is surprising that this want has not been before this supplied.

WE have received a circular from Mr. P. Buchan, President of the Working Men's Home Union, in regard to the proposed operations of that Society. The vagueness of the above appellation certainly needs some gloss. We understand from the circular that the two main objects of the Union are to obtain fair rents for working men's dwellings, and, secondly, to take care that such dwellings are kept in a proper sanitary state. We cannot but think that it would have been better to have aimed only at the latter object. We have no sympathy with landlords who charge exorbitant rents for premises which

they let to working men, but it is perfectly clear that the two objects are entirely different, and that one would be quite enough for any association to attain. The first matter is one which is a good deal regulated by purely economic laws, for unless there is a great demand for house-room by artisans, it is obvious that the landlords could not obtain an exorbitant rent. Again, it is difficult to see how a society like this can make a landlord take a lower rent, except by some kind of business competition. But it is well within the power of such a society to bring pressure to bear on the Sanitary Authorities and on landlords, so that sanitary defects may be remedied. No one can fail to sympathise or to support such endeavours, and we would strongly urge on the Working Men's Home Union to confine their efforts to the making the homes of working men healthy. They will find that steady work in this direction will be fully as much as they can accomplish.

THE White Lead Company, Limited, was, as probably a good many of our readers know, brought out in May of last year with a good deal of *éclat*, and its shares were applied for many times over. Since that time it seems to have been under a cloud, and the promise of great dividends has not yet been fulfilled. From a circular recently issued by the Board, it would appear, however, to be now emerging from the recent gloom. That its promise should be fulfilled is a matter in some respects of public interest, since it is claimed for the method of manufacture adopted by the Company that it is quite harmless to those engaged in the process. Anything also which cheapens and yet keeps efficient materials of any kind is also useful. It is immaterial to us whether its shareholders find it a satisfactory concern, but for the two reasons just given we hope that the Board is correct, and that the enlarged works will enable the Company to carry out its original programme. At the same time it is well to point out that those who bring out industrial companies might as well state a little more frankly when their works are inadequate for the purposes of the business, for we take it that no one who joined this company expected to see October, 1890, without having received a dividend, and that so many months were to be occupied in putting the works into a satisfactory state.

IT is satisfactory to see that District Surveyors are turning their attention in a practical manner to the subject of sky-signs, and that the Bovril Company have been summoned by the Surveyor to the St. Luke's Vestry for projecting a gigantic "B" over the street so as to constitute a danger to the public and an infringement of the Local Metropolis Act. The magistrate took the same view, and fined the company 40s. We fear that the law as at present existing cannot interfere with letters that do not project beyond the frontage; but it is something to get as much check on sky-signs as this. Perhaps some District Surveyor will next take up one of the cases of affixing huge boardings for advertisements in front of buildings, as alluded to in our correspondence columns of the last two weeks, and see if a conviction cannot be obtained on that score also.

IN a letter printed in this number Mr. W. P. Buchan refers to one point to which we have often thought attention should be directed, viz.: the inadequate quantity of water frequently allowed for the flush of waterclosets. Considering how important it is, in a sanitary point of view, that there should be an adequate flush of water to carry matter quickly to the sewer and to prevent the chances of stoppage in the house drain, especially in crowded cities, the restriction which water companies often endeavour (not always successfully) to place on the amount of water allowed to

pass at each discharge, by means of what are called "waste-preventing supply cisterns," is a dangerous one, and a very false economy as far as the interests of the public are concerned, though it is no doubt an excellent one in the interests of the water companies. This is particularly the case in London. We have known cases in London houses (and no doubt there are many such) where the water admitted by the waste-preventer was absolutely insufficient to cleanse out the pan, with consequences which may be imagined: the matter is rendered still worse by the slow filling which is allowed to the waste-preventer, which is not ready for use again till perhaps ten minutes after the first discharge. No doubt many pans are so unscientifically constructed that the full power of the flush would not be obtained in any case; it is not only a question of how much water, but how it is introduced. But it is far better to allow a wide margin in the supply of water and allow the possibility of a certain amount of waste, than to risk the clogging of the drain, with all its disagreeable and insanitary consequences. Some London water companies endeavour to enforce, as far as they can, the employment of a supply cistern admitting only two gallons at each flush, a quantity which is most inadequate. Such a restriction ought not to be countenanced by the sanitary authorities of any city. Mr. Buchan, one of the most experienced of sanitary experts, considers three gallons too little, and advocates four, an error on the right side at any rate. But the two gallon "waste-preventer" is an enemy of public health, and should be put down.

THE report in last Saturday's *Times* on the "Arts and Crafts Exhibition" is a characteristic example of the "Philistine" point of view in these matters, of which the leading journal is so faithful an exponent. As our readers know, the Arts and Crafts Exhibition was set on foot with the express object of doing away with the wholesale production of what is called art by large firms, behind whose name-plate the real artists, where such existed, were hid in obscurity, and of bringing forward the personal work and personal credit of the individual artist in such things as furniture and wall-hangings. Visitors to this year's Exhibition, as noted in another column, have already felt disappointed to find that the shop element was invading this Exhibition also, and that we have collections of furniture, with the names of well-known *entrepreneurs* of art-workmanship placarded above them, just as we may see them in every ordinary "International" or "Industrial" Exhibition. But to the daily press intellect this is the great point in the present Exhibition. "Regarded as a whole, the present Exhibition is an improvement upon its predecessors, especially as the names of some important firms who have hitherto held aloof from the Society are to be found in the catalogue"; and the reporter ("critic" one cannot call him) goes on to pick out costly pieces of furniture which are labelled with the names of "important firms," but which are in fact among the common-places of the Exhibition, and represent only the kind of thing which money can always purchase. In one instance the *Times* pitches on an original piece of work, the "mahogany settee with canopy," which is designed by Mr. Mackmurdo; but not a word is said as to the designer, it is only referred to Messrs. Wilkinson & Co., one of the "important firms," for whom it was designed by Mr. Mackmurdo. To the daily press intellect and its public the question is not, who designed and made an excellent piece of work, but, "who sells it?" And if it bears a well-known selling name it is worth mention; otherwise not. There are in the same room with the exhibits of the "important firms" about half-a-dozen pieces of furniture showing the thought and the work of an original artist; but the reporter cannot see these; they are not labelled with any name known on the shop-fronts of Oxford-street or Bond-street.



IT is much to be regretted that *Punch* should have committed itself to the ridiculous misrepresentation of facts implied in a contribution to the last number under the heading "How it is done," in which a "Surveyor" (official) is represented as "taking drinks" with a jerry builder whom he has had to warn about some unsound and illegal construction, and squaring the matter under the influence of drink and good fellowship, and a consideration in money, "as a little addition to his salary." *Punch* being a journal published and no doubt mostly written in London, there can be little doubt that the satirist imagines himself to be representing the possible corruption of a London District Surveyor. If he had taken any trouble to ascertain facts before posing as a reformer of abuses, he would have discovered that the District Surveyor is not a salaried official, but usually an architect in good position and practice on his own account, and deriving his Surveyor's income, in addition to that arising out of his private practice, from fees in cases reported and dealt with, and that (supposing him capable of putting himself in the position represented) he would be probably acting against his own pecuniary interests in consenting to overlook a case of illegal construction. Perhaps, however, *Punch* was only speaking in a prophetic mood, with an eye to the time when the County Council shall have abolished the high-class architect from the ranks of its District Surveyors, and reduced them to the position of small-salaried officials forbidden to undertake any other work. Then perhaps the scene depicted in *Punch* might be within the bounds of possibility—but not till then.

THE nursery-gardens of London,—bright, fragrant, little spots, laid out here and there in the now predominant desert of houses,—have not as yet, so far as we can at this moment recall, inspired the recording voice of their own *vates sacre*. Perhaps they have been deemed to be too insignificant: yet they owned a certain charm of their own, nevertheless. A garden, said Charles Lamb, is always a garden, and doubly so in London. Thus, too, writes Gray: "And so you have a garden of your own, and you plant and transplant, and are dirty and amused. Why, I have no such thing, you monster; nor ever shall be either dirty or amused as long as I live. My gardens are in my windows, like those of a lodger up three pair of stairs in Petticoat-lane or Camomile-street, and they go to bed regularly under the same roof that I do."\* They flourished chiefly in Old Brompton, Paddington, and St. John's Wood. Many of these have gradually disappeared within our memory. In the last one or two years the nursery-garden in the Wellington-road, St. John's Wood, has been taken for the practice wickets and covered tennis-court of the M.C.C. at Lord's cricket-ground. Smith's nursery, at the higher end of Richmond-road, by Thornhill-road, Barnesbury, was to have been covered with houses. But the Islington Vestry bought the land for £2,000. (of which sum the late Metropolitan Board of Works agreed to contribute one-half), and opened it last summer as a public recreation-ground, by name of Thornhill-gardens. A different fate overtakes the Pine Apple Nursery, Maida-vale, Messrs. Hooper & Co. (Limited), having acquired a ninety-nine years' building lease of that site.

MR. CARBONELL, the Vicar of Fairford, in Gloucestershire, has, we observe, been obliged to make a further appeal for funds to pay for the preservation of the church, and more especially of the stained-glass windows. It is to be hoped that his appeal will be generously met, and we can only suppose that abundant funds for the purpose were not before forthcoming because the great beauty and inestimable value of the Fairford windows is not sufficiently known. As a matter of fact, they are

priceless; no such series exists anywhere else in England, and no money could replace them. Many years ago—1826—Cobbett, in one of his "Rural Rides," thus writes of them: "Its windows of beautiful stained-glass had the luck to escape not only the fangs of the ferocious good Queen Bess, not only the unsparing plundering minions of James I., but even the devastating ruffians of Cromwell." There is no reason why, with proper care, these unique windows should not still last for many generations; but if they are to do so, each generation must take care that they are handed down intact, and it now rests with the present generation to do their duty.

WHAT is called "the Vyrnwy Hotel Scandal" at Liverpool seems to have furnished an unusually apt illustration of the folly of entrusting house planning and designing to men, however otherwise clever, who have made no special study of it. It appears from the report in the Liverpool *Daily Post* of the Council meeting held last week, that it had been decided to build a small hotel at Vyrnwy, where the new Liverpool reservoir has been made, at a cost of 5,000*l.*, and with the mistaken idea of economy, they put the matter into the hands of their very able water engineer, Mr. Deacon. The economical result appears to have been that the hotel which was to have cost 5,000*l.* has cost from 11,000*l.* to 12,000*l.*; the architectural result has been that the landlord, who was to take the hotel over on lease from the Corporation, refuses to sign the agreement on account of the bad planning and arrangement of the house. In a letter which was read at the Council meeting he complains that the cesspool for drainage, which would have to be cleared out from time to time, is within forty yards of and in sight of the drawing-room window, and abuts on what would be the favourite walk of the hotel grounds; that the cottages in connexion with the hotel contain no sleeping rooms except attics in the roof, and are therefore practically uninhabitable; that the heating apparatus, "from its ill-judged and awkward situation, close to the dining-room door and bar, causes a great nuisance by emitting such noxious fumes when it is opened for filling, as to annoy many of the guests who have stayed here, besides the ash and dust which often cover the hall furniture and bar-fittings;" and, to crown all, that the cellar for the heating apparatus is placed between the wine and beer cellars! It may be doubted if even Lord Grimthorpe could have beaten that. We should advise the Liverpool Water Engineer to retire from practice in house-planning, and the Town Council to make a memorandum that when next they want a house built for letting purposes it may be cheaper in the end to employ an architect who has some knowledge of the subject.

SIR E. WATKIN has been lecturing at Wrexham on the Channel Tunnel, and concluded with the remark that "they had reason to believe that there was no country in Europe except our own where any party was to be found that would not approve and welcome the construction of such a communication." Precisely so: he could not have stated the case against it a more terse and pithy manner.

THE PUBLIC LIGHTING OF LEWES.—On the 1st inst. a meeting of ratepayers was held at the Corn Exchange, Lewes, to consider the question of the lighting of the borough. The Mayor, Alderman White, presided. For some time past, it is stated, there has been a general feeling of dissatisfaction both with the quality of the gas supplied to the public lamps and with the price charged for the same, and the discontent has found expression in a demand either for a better and cheaper service of gas, or for the introduction of a superior system of illumination. Speeches were made by Alderman Farncombe (who explained the position of affairs), the Hon. A. Brand, Mr. T. de Castro (Chairman of the Gulcher Electric Light Company), and others. The introduction of the electric light was strongly advocated by some of the speakers, but some fears were expressed as to its successful maintenance. The meeting was ultimately adjourned for a fortnight.

## THE ARTS AND CRAFTS EXHIBITION.

THE third exhibition of the Arts and Crafts Society, which has opened this week in the New Gallery, is hardly equal to the two which preceded it, and we fear there is evidence of some departure from its original lines. In the first two exhibitions we had the satisfaction of seeing designs for furniture and decoration exhibited purely as designs, and on the same footing as pictures in a high-class exhibition. This year we find that the "furniture firm" has invaded the exhibition; we have a partitioned-off room of furniture devoted to a special firm, just as we see at industrial exhibitions, like the recent ones of Glasgow and Edinburgh, &c. Other furniture shops are prominent on the various labels; there is a profession of giving the name of the actual maker and designer (not always carried out), but this is in subordination to the name of the seller. If this system is allowed to invade the Arts and Crafts Exhibition, there is an end of all its real motive and function. What have these names of furniture-shops to do with art? It is just as if, at a picture exhibition, a picture-dealer's name were put centrally in the catalogue, and the painter's name as a sub-heading under it. We observe also that one exhibitor (who is a member of the committee too) has tacked price-cards on to his exhibits! Unless this kind of thing is stopped with a strong hand, the Arts and Crafts Exhibition will degenerate into a mere æsthetic bazaar, of which we have plenty already, and will lose its distinctively artistic character and its very reason for existence.

The present exhibition is arranged somewhat differently from the preceding ones. The cartoons for mural decoration and windows are collected in the South Gallery (where the catalogue numbers begin); the West Gallery is mostly given up to textiles, and the largest room, the North Gallery, to furniture. In the South Gallery a cartoon by Mr. Burne Jones (8) for a series of nine lights for a window of Jesus College Cambridge, occupies a central position; this and some other designs of his are again all catalogued under the head of "Morris & Co.," who executed the work; an entire inversion of the proper order of things. The window represents the ninefold hierarchy of angels according to mediæval classification, one figure to each light, and is very similar to the same artist's painting of the "Days of Creation"; mild-looking figures all with the same rather melancholy expression of face. A fine colour effect will no doubt be obtained by the wings and drapery. In the executed windows, but there is something very feeble intellectually in this conception of angels; how different from the powerful beings whom Raphael produced as angels. The first figure in the row holds a drawn sword which he looks as if he would never have strength to use. There is a weak mannerism in this style of art, for all the grace of pose and drapery, which will cause a future generation to marvel at the sentimental taste which was satisfied to admire it.

Mr. Madox Brown's cartoon for one of the Manchester Town Hall paintings, "The Baptism of Eadwine" (22), is a far more robust piece of work, distinguished by excellent draughtsmanship, though some of the figures, notably the queen and her children on the right, look too much like modern people arrayed in ancient garb. The grouping of the figures so as to give all the incidents of the scene and at the same time preserve the fitness of composition proper to mural decoration, a point in which the artist is a master, is admirably carried out. Mr. C. W. Whall occupies the centre of the west wall with a cartoon for a three-light cemetery chapel window, flanked by two other designs for part of a memorial window, of which the one representing St. Christopher is a fine design, the principal figure very good, and the attempt to convey the effect of water in a manner suitable to stained glass work is very successful. There is a danger, in the decorative treatment of sacred subjects in somewhat rebellious materials, of reducing them to mere experiments in conventionalising, which is certainly not avoided in Mr. Heywood Sumner's sgraffito design for Clane Church, Kildare (2), representing the Baptism of Christ. The principal figure is stiff and expressionless, the water is indicated by concentric dark and white rings drawn in perspective round the feet of the figure, the palm trees above are conventionalised into shapes that are not beautiful, and one is chiefly im-

\* Letter to the Rev. Norton Nicholls, dated from Pembroke College, June 24, 1769.



pressed by the cleverness of the designer in this kind of translation of nature into ornamental patterns. The companion work (54), "The Resurrection," or rather the two Mary's and the angel at the sepulchre, is much more successful, as the decorative lines are finer and the figures freer in line.

Among minor works in the same room is a cartoon for a wall-paper by Mr. Walter Crane, called "Corona vite," consisting of a large repeating pattern partly composed of figures, and a grandly-designed frieze of angels whose wings are in a decorative sense splendidly treated, and in a manner exactly suited to the material. The paper itself (by Messrs. Jeffrey & Co.) is hung in the north gallery, where the frieze loses its effect through being treated in flat tints in ordinary colouring, while the lower part of the paper is resplendent in gold; if this is intended to be the finished effect of the paper, it rather kills the frieze, which is the finest portion. We observe that against Mr. Walter Crane's designs his name always appears in the central position on the page, though we presume Mr. Crane does not make wall-papers, any more than Mr. Burne Jones makes stained-glass; the catalogue is very inconsistent in these matters. Mr. Frank Murray, again takes the central place as the artist of the two decorative cartoons for a Marine Insurance Office (21, 28), Salvati's name appearing modestly in small letters as the executant. Why are not "Morris & Co." content with the same arrangement in similar case? The cartoons represent "Ancient and Modern Shipping," not a very good subject for decorative mosaic, but this is a praiseworthy attempt to give a little meaning as well as colour to the decoration of a business building; the design for the building was exhibited in the architectural room at the Royal Academy. Among other exhibits in this room may be mentioned Mr. Dressler's bas-relief from a design for the centre of an altar-piece by Mr. J. D. Sedding "The Nativity" (75); the same sculptor's little design for the back of a hair-brush to be executed in silver, showing a figure of a mermaid in bas-relief; Mr. A. Silver's design for cretonne in three colours (31); Mr. Bladen's design in water-colour for stained glass (42), a profile of a fine female head with the flowing hair partially filling up the background; and Mr. Selwyn Image's design for a stained window for a drawing-room (23), in charcoal and chalk, a very bad medium for conveying the ideas of stained glass effect; we happen to have seen the design in execution, where the colour effect is very rich and the detail very original, but the design is ungraceful in its general lines, or rather it has no general lines, it is a set of patches of colour, decorative only as colour and not as form. The case of bindings by Mr. Cobden Sanderson contains some exquisite work (88), especially the rich little copy of "In Memoriam," but we should fear that such bindings can only be produced at a cost almost prohibitive to most owners of libraries.

The textile exhibits in the West Gallery illustrate the divided feeling which exists at present between the partially realistic and the purely conventional and symmetrical treatment of foliage forms in embroidery. The gallery contains two very fine examples of these two apparently opposed systems. One is a curtain embroidered on blue linen (subject, "Fruit Tree") designed by Miss May Morris and executed by her in conjunction with Miss Yeates and Mrs. Emery. This is a sumptuous rendering of a fruit tree with the flowers and fruit treated in irregular masses, with spaces between; a more conventional type of acanthus-like foliage worked in outline runs through the whole as if to bind it together. The more purely conventional method is shown in Mr. W. Morris's design for wall hanging (151), coloured and darned by Miss (?) Catherine Holliday. This is a symmetrical flowing design in immense acanthus-like leaves which dispart from a centre and curl round either way; it is a grand-looking design, though it may be just a question whether this scale of leaf is not rather too large and tends to dwarf the scale of a room of ordinary size. This tendency to large and too pronounced detail in work of this kind is illustrated here and there in other pieces of work in the room, as in the embroidered "frescosen or cushion" (115) designed by Mrs. Hallward, which is powerful but far too "loud" in effect. Among the larger textile works is a fine piece of silk embroidery by the Leek Embroidery Society, one of the numbers 96, 97, and 98; the catalogue does not distinguish

Mrs. Thursfield exhibits a bed cover embroidered in Tussar silk, of a pattern taken from the ceiling of a room in the house of Orchomeno, Boeotia; the early Greek spiral ornament used as a diaper, with a border of circular pattern. This is effective and pleasing, though it is not exactly the kind of detail to select for textile work, being too architectural in character. The wall hanging designed by Mr. Heywood Sumner and executed by Miss Mary Augusta Smith, representing "Earth, Air, Fire, and Water" (127) is curious and clever, but has the objection that we find in the same designer's sgraffito of the Baptism of Christ; the forms and lines are not pleasing in a decorative sense. Mrs. Thackeray Turner's "Embroidered curtain, worked on hand-woven Assam silk in Morris & Co.'s crewels" (166), is an example of the style of foliage design which approaches nearly to realistic work and avoids all symmetry or conventionality of arrangement, except in spacing the design so as to distribute it equally over the ground, which is very little covered, the design meandering over it in open lines. The tone of the ground is very pleasing, and the whole effect quite as decorative as in some of the very richly worked examples in which the whole ground is covered. Miss Humphrey's dinner-table centre "worked in silks on white brocade satin" (124) is an example of the charming effect which may be produced by working a design on a ground which makes a subordinate design beneath the principal one; the effect is very pretty, and the foliage of the border design, in colour silks outlined with *clousons* of gold thread, is a beautiful bit of work. Miss Gattson's coverlet in appliqué work designed by Mr. H. Home (143), has a border of conventionalised poppies, with the central part ornamented by the repetition of the words "Quid est somnus gelidus nisi mortis imago," arranged in squares of decorative letters with blank spaces of ground between. There is a curious and original fancy in this, but the sentence is not a very comfortable one to place on a bed-cover; and why repeat a facsimile of it over and over again, when each repetition is a separate piece of hand work? Among smaller things may be mentioned a bit of silk embroidery by Miss Clara Day from Mr. Lewis F. Day's design (118), a collection of cretonnes (100), exhibited by Mr. T. Wardle, some of them reproduced ancient designs, others by various designers who are mentioned (they vary much in merit, but some are very good); some dessert doyleys embroidered in silk with small conventional flower designs (135) by Miss May Field, and three side-board cloths in different Norwegian styles (188a) by Miss Julie Nøregard.

The West Gallery contains also a few pieces of furniture of some individuality. The chimney-piece designed by Mr. Lethaby and exhibited by Messrs. Farmer & Brindley looks rather as if it were intended to exhibit specimens of marble, but the refinement of the thin shelf at the top, with its delicate curves and small moulding, should be noted. A "Presidential Chair" designed by Mr. Ashbee and executed at his School of Handicraft, we give a sketch of (see lithograph); the characteristic portion of it is the embossed leather back, laced on to the framework so as to give play to it and leave an open *joint* between the leather and the woodwork. The lower portion of the chair is somewhat too ostentatiously simple, and thereby is out of keeping with the ornate character of the leather work. Otherwise it is of interest to see well-designed plain furniture, in regard to which we give a sketch of Mr. Spooner's sycamore sideboard (238), a good workman-like example of a "cottage" sideboard, with a very pretty band of slightly-sunk floral ornament running across it (too small to be shown in the sketch). Interesting for the same reason is Mr. F. Madox Brown's "Chest of drawers for workmen or cottager" (307) in the North Gallery, of which also we give a sketch. The handles for pulling the drawers open are sunk in the drawer fronts, the rounded back of the sinking being gilt; on opening a drawer we perceive that this necessitates a covering-piece being fixed inside, producing a couple of excrescences in the interior of drawer, which looks awkward; but at all events the pull in opening the drawer comes on the solid front, and not on an affixed handle; and we all know what a tendency the handles of ordinary sets of drawers have to come off. In the West Gallery is also a very

characteristic table (236) designed by Mr. Lethaby for a piece of green porphyry which forms the table surface, the design being made to fit the shape of the porphyry slab: we give a sketch of this (see lithograph).

The North Gallery, as observed, is devoted to furniture, and there are some very rich and elaborate pieces of work shown out of the stock of some large dealers. In Messrs. Colnaghi & Lock's exhibit all the articles are designed by Mr. G. T. S. Lock, and the exponents' names are given; the execution is all admirable and the design unimpeachable in a general way, but it just wants that individuality which an artist turning his attention to furniture can put into such work, and it is for this that we come to the Arts and Crafts, not to see cabinet-makers' art, however good of its kind. The same remark applies to the sideboard exhibited by Messrs. Gregory & Co. (359), with the names of four workers appended to it; it is satisfactory that the movement initiated by the Arts and Crafts Society has led to some large furniture dealers admitting the propriety of giving the names of the actual designers and workers; but this sideboard still has the air of the furniture shop about it; it is only like many other such things that one sees, furniture worked up to a certain degree of richness of effect and costliness, but a mere repetition of old ideas and old details that form a cabinet-makers' stock-in-trade.

Some few things may be mentioned which illustrate the difference between artists' and cabinet-makers' design in furniture. Mr. R. T. Blomfield's mahogany corner cupboard, inlaid with snake-wood and ebony (311), is one of these; essentially an architect's design in its general form and the treatment of details; it is executed by Mr. John Finch. Another is the mahogany writing cabinet designed by Mr. Ernest W. Gimson (313), a charmingly original bit of work, very simple in its lines, and with one bit of inlay ornament forming a circle of enrichment in the middle of the otherwise plain front. Artistic effect is not necessarily produced by covering a thing all over with ornament, as cabinet-makers imagine. The cabinet designed by Mr. Lethaby and executed by Mr. A. Bowen and Mr. T. Ward (316), is another example of work thoroughly artistic in feeling though entirely without ornament properly so called; it produces its superior effect by superior workmanship and the care with which all its lines are set out. The "Bachelor's Sideboard" (319), designed by Mr. G. Jack, is very well planned for its purpose and in excellent taste in regard to design. It is exhibited under the name of "Morris & Co.," as is the very different-looking oak cabinet standing by it (323), and designed also by Mr. Jack. This is a highly picturesque-looking piece of furniture, consisting of a chest of drawers below, a table-top with a small plain cabinet at the back, which latter forms a kind of pedestal for a great over-sailing coffer at the top, the front of which is enriched with a carved frieze. There is a very fine effect about this; it impresses one as if it came out of an old picture; but the coffer at the top does look rather top-heavy. The large mahogany settle with a canopy over, designed by Mr. Mackmurdo (283), is noticeable for the treatment of the posts or colonettes which form the supports at each end, with their solid plinths with partially rounded faces; the manner in which the legs under the framework of the settle are set back so as to be out of the way is another little practical point worth notice. A large mantle fitting of teak (333) is exhibited under the name of Liberty & Co., but with no name of either designer or workman; this is an attempt to work in the details of Egyptian architecture, the overmantle being treated with miniature columns and lotus capitals, while above is a cornice with the usual section of Egyptian cornice, but immensely magnified as compared with the columns. To the architectural eye this is an absurdity; the best portion of the design is the repoussé copper work forming the face of the fire opening. Two chairs which go with it are copied from a well-known example in the British Museum. We should not omit to notice also the very characteristic little "Billiard" screen by Messrs. H. & J. Cooper, with painted panels by Mrs. Jopling, and the inlaid walnut coffer and bench designed by Mr. Lethaby (417), a piece of work with the feeling of the Renaissance in it, and with some beautiful floral inlay work on the sides. We notice also in the same gallery an effective frieze panel



in plaster by Mr. T. R. Spence (371), of which a sketch is subjoined.



Frieze panel in plaster by T.R. Spence 1890

We omitted to mention in the West Gallery the great fireplace at one end of the room, the joint design of Mr. Wilson and Mr. Pomeroy. This consists of stumpy marble columns carrying a ponderous overmantel in aluminium, decorated in relief with a figure of Undine rising amid a mass of conventional foliage; the side portions are differently toned and treated, and suggest water and fishes. The central portion is very boldly modelled; the capitals and columns unfortunately have rather a clumsy appearance. In the entrance hall there are some good things, some of which we give sketches (see lithograph). A piece of frieze designed by Mr. T. R. Spence, and in which no less than four artists have collaborated, hangs on the gallery railing, of which we give an illustration; also by it a very boldly-modelled heraldic panel (477) by Mr. W. Aumonier, of which we give a sketch, and which is intended for that fine house of "Rhinefield," Hants, which was illustrated in the 1889 Royal Academy in a drawing published in our pages on August 17 of that year. Another heraldic sketch is a lion designed by Mr. J. D. Sedding (see illustration). Mr. J. D. Hunt exhibits a cast and wrought lead wall cistern (472) of which we give a sketch, designed by Mr. R. T. Blomfield, an altogether novel and peculiar bit of work, decorated with gilt dolphins in low relief meandering over the lead ground. We give also a sketch of Messrs. R. A. Bell and G. Fraumpton's "Panels for an Altarpiece" (478), in which the kneeling figures in the upper panels, on either side of sacramental cup, are very graceful in pose and sentiment; we are not sorry however to read the note that these panels are executed in a church near Liverpool "differently coloured," for the colours here are sickly and ineffective. Among other objects in the hall is a marble chimney-piece (466) rather remarkable for neatness of execution than originality; a lion in mosaic by Mr. T. R. Spence (480) shown in the subjoined sketch; a powerfully modelled

The balcony contains a number of small but pretty and interesting things; book illustrations and ornaments by Mr. Walter Crane, among others a selection of original drawings for "The Book of Wedding Days," a very pretty variation on the old-fashioned "Birth-day Book" idea. Mr. Whall exhibits a frame of designs showing what can be done in decorative effect by lead-light glazing (for Bank screens &c.) without any colour (576); it is a new idea of which something may be made. In the table-cases in the gallery are some admirable examples of printed books, notably those from the Chiswick press; books which it is a pleasure to look at for the mere neatness and finish of their pages.

There are plenty of things that are interesting and pleasant to look at, but we fear there is some falling off in the success of these exhibitions both in regard to the contents and the attendance. The introduction of anything like the shop class of exhibits is, as we have already observed, a mistake which will prove fatal if not corrected; we can get that kind of exhibition anywhere; but simultaneously with this there seems to have been a falling off in interest on the part of fickle and changeable London society; the private view was by no means crowded, and the rooms have been but very sparsely attended since. Both facts are disappointing, for when the first of these exhibitions was started we regarded it as a new and most interesting form of art exhibition, filling a real want and which, from the great interest it aroused, seemed likely to have a most prosperous career and to be a very good influence on art-handicraft. It has given a stimulus to this class of art already, but there should be a rally round it of those who are real artists in design: it cannot be kept up by drawing on furnishing firms, of whatever reputation and wealth.

#### ON THE TECHNICAL EDUCATION OF ARCHITECTS.\*

ANOTHER branch of study, not included among the Institute subjects of examination, but of no small value to the student of architecture, is archaeology. In fact, the architect has to study the buildings of the past, much in the same way as the archaeologist studies the whole life and work of past times. To those who have the time for it, the study of archaeology can be warmly commended, and we have in this college special facilities, as you all know, for the pursuit of that study under Professor Poole, whose lectures and demonstrations take a wide range.

We now approach a group of subjects where the instruction received in any college cannot of itself suffice, but must be supplemented by practical experience, but where the technical study for the most part forms the subject of the work of class B. for the study of construction which I conduct. In that class all the more important building materials, such as wood, stone, slate, marble, brick, terra-cotta, lime, cement, and iron are taken up in succession, their strength, weight, durability, and other properties described, and the defects and excellences of bad and good specimens are pointed out, and the part they play in building construction is explained. The general principles of construction, trussing, walling, arching, vaults, domes, and so on are also taken up in succession, and are passed in review, and thus the whole of the subjects named in that part of the programme for the examinations which deals with materials and construction are in turn dealt with. No examination papers have been yet published to show exactly what the scope of the intermediate examination is to be, but, judging from the published programme, it appears to me that a student going through this course, and doing a proper amount of preparation work at home, ought to be well able to pass that part of that examination, and the lectures will be adapted to secure that aim. No academic course alone is to be relied on to impart that practical knowledge of construction which the final examination requires, but the course here will suffice if supplemented by home work, and by diligent use of the opportunities which are enjoyed during three or four years in an office, with access to works in progress, to prepare the

student for passing that examination, so far as the building subjects go.

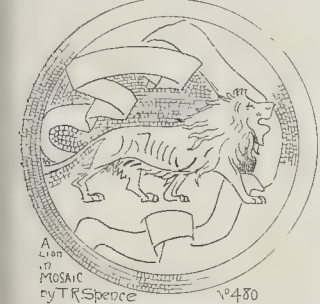
At the same time that I give this statement of the work of one Construction class, I am bound to add that it is impossible in a single course of lectures, and difficult for a single Professor, to pursue the study of all the numerous and very various known building materials as far as it is desirable, in some cases at least, to push it. Accordingly, that part of the course of Engineering and Mechanical Technology can with advantage be taken by architectural students, in which the manufacture of iron and steel, and the strength of materials and structures, forms the subject; and also that part of the course of Chemical Technology which covers the technology of building materials. I have already alluded to geology, but ought to add here that those students who are acquainted with that science in its main outlines will yet do well to take the course of lectures on Economic Geology, for the sake of the information they will afford on the geology of building stones.

Passing now to the subjects connected with architecture as an art, the instruction given in the Architectural A or Art class takes up the subjects required for the art side of the examinations, but, as in the case of the science subjects, they must be supplemented by drawing and measuring existing buildings, and by other study. In order to enter for the Intermediate Examination, the student has to do an amount of preliminary work which will be of great value in making him familiar with the forms, features, and ornaments of Classic and of Gothic art, and it will usually be best for him to do that in the office where he is a pupil. Here, in the class-room, the history of the art is pursued, beginning with Greek and the styles on which Greek is founded, and then taking up successively Roman, Basilican, Byzantine, Romanesque, Gothic, Renaissance, and modern art, and, in addition to the history, pointing out the distinctive qualities and features of each, and some of the principles of design which were dominant in the successive periods. It has been my custom, and I intend to follow it in the coming session, to take Greek architecture more in detail than any other part of the course, partly on account of the great importance of the subject, as at the root of almost all architecture since, and partly from the circumstance that it lies in smaller compass, and it better admits of a somewhat thorough examination than any other style.

Drawing, though left to a late part of the lecture, is a subject of which the importance cannot be overrated. As I have often pointed out before, drawing in three ways is the servant of the architect. He first learns to know all the forms, features, and details of buildings by drawing them, and learns how buildings are planned and contrived by making plans and working-drawings; in short, it is through the use of the pencil that he fills his mind, hand, and eye with the material out of which any designs of his own must be made. Secondly, the pencil is the instrument which assists,—nearly enables,—the architect to design his buildings and their details. The most original mind could not go far if prohibited from working pencil in hand, and required to think out the entire idea of a proposed building before putting a line on paper. Thirdly, the pencil enables the architect to prescribe what to do to the workmen who will be engaged erecting his building, or preparing portions of the fittings of it so precisely that they fall into their place exactly, and to make clear to his clients what the proposed buildings will be like. Without good, exact, and complete drawings, the modern rapid method of erecting buildings would be simply impossible; and though small and plain structures can be built,—as probably English parish churches were previous to the fifteenth century,—practically without drawings, the mode of procedure and the nature of the buildings were quite different from what we have to deal with.

In order to be a good architectural draughtsman, with cultivated eye and hand, a man must learn something of what is called freehand drawing, and it is best that he should begin with it. He who, when he commences his acquaintance with drawing, has a square and rule and compasses put into his hands, is never likely to go alone without them, and is never likely to learn to use them as an artist should. A good draughtsman is made by mastering the drawing of the human figure from the flat and the round, and where practicable from the life

\* Being the concluding portion of the opening lecture delivered by Professor Roger Smith to the Architectural Classes of the University of London (Session 1890-91) on October 2. (See p. 285, ante.)



wrought-iron newel and panel for a staircase designed by Mr. W. A. Fenn—a bit of classic wrought iron, free and powerful in treatment; a small wrought-iron music-stand adapted from an old design (465) by Mr. A. W. Battershall; the Ellison challenge cup (511) in cast silver chased and repoussé, by Mr. F. Era-Harrison, of which we give a sketch, it is very good in general form, but the details of modelling seem a little wanting in crispness; and cases of their respective wares exhibited by Messrs. Powell, the Murano Glass Company, and Mr. de Morgan. The collection of the latter contains some very fine work in pottery, both as to colour and design. The Cantagalli firm of Florence also have a case of their pottery, which is admirable enough both in colour and design, but then it is a sheer imitation of Renaissance work, and nothing more.



and by then being introduced to the use of drawing instruments; and he deserves the name of "good" when he can work with the instruments in his hand as freely and as unfettered as if he were simply using chalk, or pencil, or etching-pen. In laying out the course for a student acquiring technical education at a college preparatory to becoming the pupil of a practising architect, to pursue the wisest plan, in many cases, would be to devote whatever time can be spared from other subjects to figure-drawing, and to postpone all geometrical drawing and the study of architectural features,—such, for example, as the orders,—till his pupillage. I hardly need say that for this work there are facilities in the Slade school, forming part of this college, inferior to no art school in London. Where the pupil is already a good draughtsman, or, in some cases, where he has not the facilities in the office where he is articulated for pursuing the kind of work, I believe a school of architectural drawing here would be of service, and I do not doubt the feasibility of establishing one as soon as a sufficient field of usefulness seems open for it.

This additional consideration must, however, be borne in mind: that the study of drawing is calculated not merely to make a man a draughtsman, but to promote his becoming an artist. Some small spark at least, of artist's knowledge, feeling, and skill must be part of the architect's composition, or he will be but a poor sort of an architect, however elaborately trained; and it is to work in the Art School that we must partly look for rousing any germs of artistic enthusiasm there may be, for opening a man's eyes so that he may know how to see the beauties of nature, and how to appreciate the art of good pictures, statues, or buildings. And among auxiliaries for helping to learn the nature of art let me include the lectures given here by our newly-appointed lecturer on applied art, Mr. Stannus. No architectural student will regret attending them, and I doubt if any more interesting and stimulating instruction can be obtained by a student anxious not merely to make himself familiar with ornament as used in architecture, but to understand the reason why good ornament is good, and bad is bad; in short, the principles which underlie all successful applications of art to industry,—among which applications architecture holds the foremost place. In speaking earlier of a liberal education, I spoke of fine-art training as calculated to give that liberal quality to an architect's education which it must not be without. Here I refer to it as an essential. Any other kind of accomplishment is desirable, but something of the artist he must be if he is not to be a failure. Here, then, time and attention may be wisely bestowed, otherwise the scientific and practical training may outweigh or smother the artistic sense, which often is not at first at all vigorous, and in many respects needs careful fostering.

I ought not to omit, and at this point ought to take up the subject of design in architecture, did time permit; but a few sessions ago I devoted a lecture similar to this to an examination of the question, covered by the following subject, "Learning to Design Buildings," and as that was printed in the professional journals of the time, I must refer you to them if you wish to see in detail what I have to say on that subject, and I will ask any who may feel interested by this lecture to be good enough to turn up the reports of that one and read them. Briefly I may point out here, however, that designs can only be made by persons who have in their possession the material out of which they are made, and know how to use it.

To put this truism into other words, the first essential in designing buildings is knowledge of buildings,—of their plan, of their structure, of their intention, uses, and qualities. The next is a knowledge of the architectural features which are put together in forming a design,—a knowledge to be only gained by drawing them, and to a considerable extent only by drawing them from actual existing examples. Thirdly, some familiarity with the principles of design or composition to be detected in good buildings; and lastly, repeated and persevering effort. If there is any branch of knowledge and of skill in which it is more true than usual that practice makes perfect, I think it is in the designing of buildings. If you compare the early-executed works of Sir Charles Barry with his latest masterpieces you will see how far he was when he began from meriting the distinction which has often been accorded to him of being the foremost architect in Europe of his

time; and his great genius was only brought out by unwearied practice in using the vast store of architectural knowledge, which during his long period of pupillage and of study abroad he had accumulated.

There remains one branch of architectural technology to consider, a branch of which much can be learnt in the lecture-room, though the nature of it is essentially practical. I allude to professional practice. This topic forms the subject of examination at the Institute, and it is one on which it is peculiarly advantageous for a practitioner to be forewarned, quite apart from examinations. A course of lectures on "Professional practice" is given by me in this College. I do not recommend students who are going through such a preliminary technical course as I have suggested may with advantage be taken before entering an office, to include this subject. The course is intended rather for men who have had some practical training and are preparing for the final Institute examination, or desire to qualify as District Surveyors, or, at least, wish to understand what is going on in the practice of the office where they are, or to prepare themselves for entering practice on their own account. The entire routine of the professional conduct of building operations from the architect's point of view, and those points in which law comes most into play, such as the Acts of Parliament regulating buildings, and rights of light and air, form the subjects of these lectures, which also include a notice of dangerous and ruinous structures, and the precautions to take in dealing with them. These lectures, I hope, may enable some of my students to profit by other men's experience, instead of having to win the whole of their experimental knowledge of practice for themselves.

It is now time briefly to recapitulate the course on which we have travelled, preparatory to drawing this lecture to a close. After referring to the now-completed series of Institute Examinations as pointing out to us the subject of technical education for architects, we divided a professional man's education, and looked at its initial, liberal, technical, and practical sides; and, after glancing at the initial and its bearing upon the Preliminary Examination, we considered at some length the nature of a liberal education, and how a man who originally has not enjoyed many advantages, may improve and expand his mind by suitable studies. A notice of practical education led to a few words on the subject of pupillage in the architectural profession, and we were then left to consider technical education in connexion with the tests involved in the Intermediate and Final Examinations at the Institute. The scheme for technical education now under the consideration of the Architectural Association appeared here to claim special notice, and if, as an old member and former officer of the Association, I ventured on some remarks that were critical in their nature, I trust it will be understood that they were not dictated by any desire to find fault,—far less to oppose,—but as a contribution to the discussion of a scheme which must be very thoroughly sifted.

I then considered the course which a different class of candidates for success in these examinations, especially in the intermediate, can follow, and I pointed out the large provision of skilled instruction in the subjects on which the technical studies of an architectural student must chiefly turn, which exists at this College, and of which a student whose friends can send him here for a session before he is articulated,—or, let me add, his master after he is articulated,—cannot do better than avail himself. This includes, of course, a brief *résumé* of the work which those who go through with me the courses that begin next week will take up, for a fuller statement of which work I must refer you to the printed prospectus; and I beg here to remind you that the first lectures of each course are open to you free, so that those who desire to do so can attend one or two lectures to see if the sort of information given is what they desire. I have, however, very little doubt that most of the students who go through the courses this session will not be in the position of the imaginary student whose course of study I have sketched; they will rather be pupils or assistants in architects' offices desirous of making the most of their time. I can only say that any or all of you will be welcome in that character. It has hitherto been almost entirely from architects' pupils that these classes have been recruited, and the hour of meeting has been fixed

and is still retained at six, as being likely to suit the majority of such pupils. I have in this paper sketched what I believe would be the most useful programme for the education of an architect; but it is not the programme so much as the quality of the teaching, and, let me add, the quality of the learning, which makes education of any sort a success. You, gentlemen, have arrived at a period when, to a large extent, a man's future is in his own hands more than in those of any other persons in any way concerned. And do not let this evening's engagement lead you to put too high a value on any system of education *per se*. A good system is a good thing, as it affords a good teacher and a good learner the best scope for their respective shares in the great work of education, but that is all. A resolute, intelligent, and persevering student can manage to extract a vast amount of knowledge if only he can get at any person, any class, or any book where the knowledge exists, even if proceeding according to a very imperfect method; and a good teacher is to a very large extent independent of any exact scheme, for he involuntarily steps over the boundaries of a cramped one and straightens the irregularities of an ill-considered one. I do not, however, wish so to be understood as apologising for the programme here as either cramped or ill-considered; on the contrary, no pains have been spared to make it comprehensive; and a great deal of consideration has been bestowed upon the question what to include, and in what order and by what methods to take up the different subjects. Of the Professor it is not for me to say anything except to claim that he has had a long experience in his share of the work, and to assure you that he has a very genuine sympathy with you in your share, and a hearty desire to be of as much service to you as possible. What you, gentlemen, may be as students, time only will show; but I can assure you that your predecessors in years gone by have been uniformly such students as it was a pleasure to lecture to, and that among them not a few have shown a diligence, an intelligence, and an artistic feeling worthy of the highest praise; and I not only hope, but expect, to have students of the same calibre in the session which commences to-day.

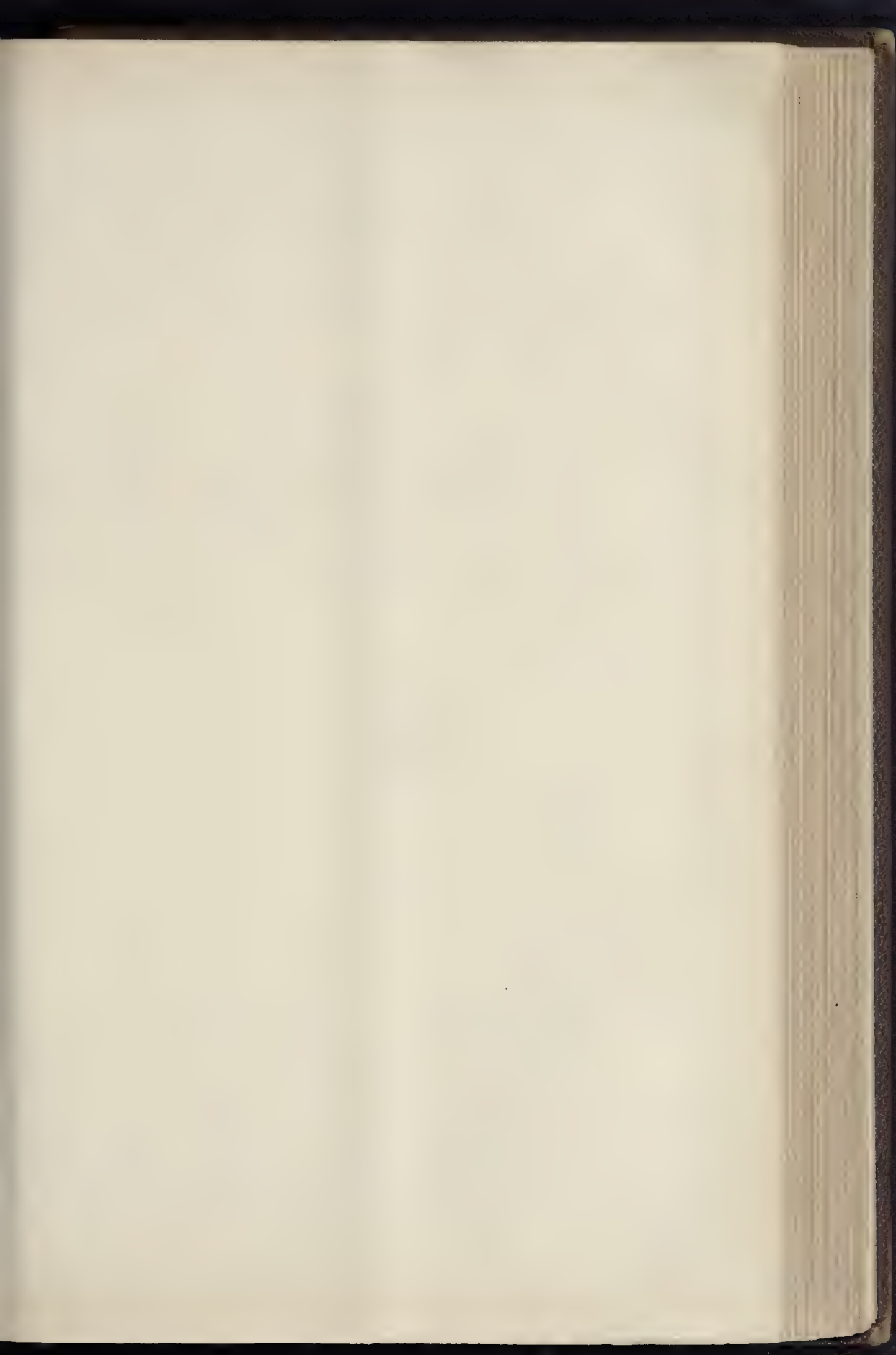
#### CITY ARCHITECTURE IN WESTERN AMERICA.

UNDER the title of "The City House in the West," *Scribner's Magazine* for October publishes a very interesting and admirably written article from the architect's point of view, by Mr. J. W. Root. For the details of the subject and the numerous plans and illustrations we must refer the reader to the magazine, but the following extracts in regard to the general position of architecture in Western America will be of interest to our readers:

"The conditions attending the development of architecture in the West have been, in almost every respect, without precedent. At no time in the history of the world has a community covering such vast and yet homogeneous territory developed with such amazing rapidity, and under conditions of civilisation so far advanced. Few times in history have ever presented so impressive a sight as this resistless wave of progress, its farthestmost verge crushing down primal obstacles in nature and desperate resistance from the inhabitants; its deeper and calmer waters teeming with life and full of promise more significant than has ever yet been known. Between the period of conquest and the period of realisation there is for art in this great development a distinct hiatus. It is a long time full of deadness, except of physical force, then a sudden bursting of art into exuberant flower. Up to a time twenty years ago every energy of the hardy pioneers who were opening the vast district now called 'the West' was expended in the most rudimentary work—that demanded by self-protection and self-support. Even now, in remoter districts, still sounds the Indian's war-whoop, and still exists something of those wild and barbaric conditions so recently conquered farther East.

During the period of this ceaseless struggle architecture, as we understand it, was not thought of; and the most primitive log-hut served for shelter. But as cities began to spring up, the 'balloon-framed' wood house was evolved. This early type of dwelling has made



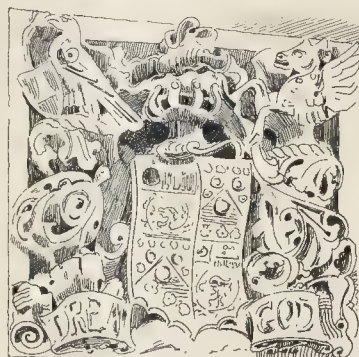


Portion of a Frieze by Reginald T. Blomfield.

478



711

The  
Ellison  
Challenge  
Cup.

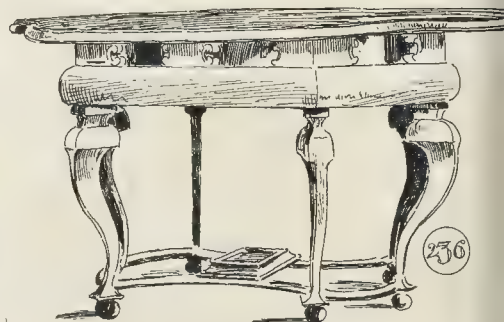
477

Heraldic  
Panel  
for  
Porch, 'Rhinefield', Hants)  
by W. Aumonier.

436

A  
Lion  
by  
J.D. SeddingA Co  
b

190

A Presidential  
Chair by C.R. Ashbee.

236

Table  
by W.R. Lethaby.





492

Water  
head  
font.



Panels for  
an Altar-piece  
by R. A. Bell  
& Geo. Frampton

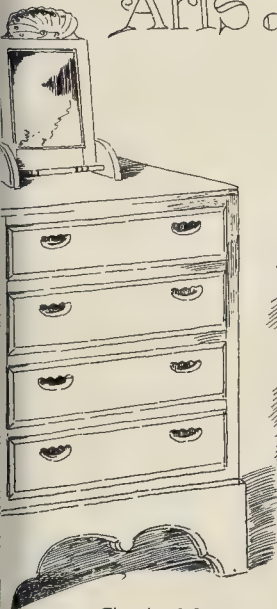
476

Cast & wrought  
lead wall  
cistern.  
by R. T. Blomfield.

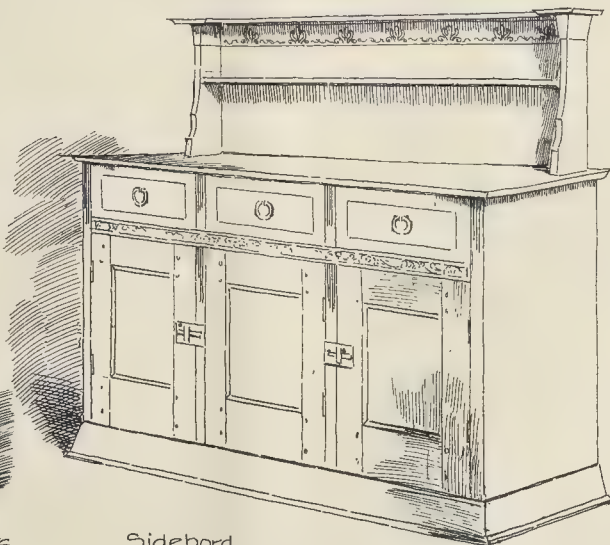


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# Sketches from the Arts and Crafts Exhibition.



Chest of Drawers  
by Ford Madox Brown.



Sideboard  
by C. Spooner.

238





the growth of the West possible. Frail as its structure seems to be, it has been the very fortress of civilisation, withstanding all assaults of heat and cold, and often baffling the deadly cyclone where massive structures of masonry succumbed. Nothing could be more simple than its skeleton. Unlike the early dwellings of wood erected in the East, no expert carpenter was needed,—not mortise nor tenon nor other mysteries of carpentry interfered with the swiftness of its growth. A leg of malle, some two by four inch studs, a few cedar posts for foundations, and a lot of clapboards, with two strong arms to wield the hammer and saw,—these only were needed, and these were always to be had. For no sooner did the yell of the Indian grow distant upon the verge of the prairie, or over the slope of the hill, even if but for a few days, than its fierce sound was followed by the drowsy buzz of the saw-mill. Even to-day many Western cities, not only like Chicago, whose earliest growth dates back fifty years, but like Duluth, Minneapolis, Omaha, and others of later growth, are more than half made up of these frame houses. In Chicago the great West Side contains thousands of them. Their life, however, is now nearly finished; for in nearly every Western city of more than one hundred thousand inhabitants the law is passed that within city limits no wood house may be built; so that the next five years will see their total disappearance in favour of more or less substantial structures of masonry.

Thus these hardy pioneers of architecture, in their very disappearance, do architecture some service, for because of them every old Western city must be almost entirely rebuilt, and this under modern and enlightened auspices, as if it had been devastated by a great fire or cyclone. This is clearly an advantage to architecture and to civilisation; that is, it may be a great advantage to architecture and to civilisation. It certainly presents possibilities to the architects of the West such as have never been given to any other group of men.

Chicago possessed a few interesting souvenirs of its early history; but these, alas! went with the great fire of 1871; and scarcely a remnant remains; and of these few not one has been spared by the irreverent hand of progress.

From the early and meagre architectural development of this and other Western cities, the present state is vastly removed. Indeed, modern Western dwellings seem to have scarcely a visible trace of relationship to these earlier types. First, let it be noted that there is in Western cities a notable absence, compared with cities in the East, of houses built in blocks. The reason for this is obvious. Eastern cities, being older, were begun, and their traditions established at a time when their citizens were more interdependent, and facilities of transportation were less complete than now. For this reason they are not only more compactly built, but ground has become dearer than in the West. The reverse is true of Western cities, and the result is that residences much more frequently occupy considerable space, being entirely detached from other houses and surrounded by their own trees and lawns. It will frequently happen that a citizen imbued with characteristic and full confidence in the future growth of his city will purchase a large tract slightly removed from the business centre, upon which he will build his home, knowing that but a short time will elapse before it will be embraced by the city itself. When his occurs, he subdivides and sells what he does not need, reserving an acre or two for his own purposes. The frequency of this kind of thing gives Western dwellings a general suburban aspect, removing them from the class of city houses to which we may have become accustomed. This suburban effect is also enhanced by the extraordinary increase in the variety of building materials, which, coupled with the characteristic Western love of novelty, often leads to the erection of houses as different in material, colour, and treatment as is possible to conceive, different dwellings in the same street being as independent of each other,—often as apparently hostile, as if separated by wide stretches of open country.

Nevertheless, many streets thus built up present a superb air of space, comfort, and even luxury. In driving through these streets the eye is at no time wearied with the monotony which is so tiresome in Fifth Avenue or other similar streets in Eastern cities, but is everywhere delighted with constant change, constant appeal to new sentiment, and that delightful

sense of the picturesque which, to the stranger, is so inspiring. Notable among such streets are Euclid-avenue in Cleveland, where the splendid residences which line it are often set back as much as two or three hundred feet from the street; Michigan Boulevard and the Lake Shore drive in Chicago, superbly paved streets with great variety of interesting outlook; Prospect and Grand Avenues in Milwaukee, the first overlooking the lake from a bluff 100 ft. high, the second a magnificently-wooded avenue 200 ft. wide; and several avenues in St. Paul, Minneapolis, and other cities. Occasionally these streets are laid out park-wise, still further accenting this suburban aspect.

San Francisco has had a very unusual architectural experience; it has been more isolated from the rest of the country than almost any other of our cities; its development, therefore, has been more peculiarly its own, and has been less modified by contemporaneous work in Eastern cities. It is only of very late years that work being done in the East has strongly modified the feeling of San Francisco architects. The fear of earthquakes has caused nearly every dwelling-house to be constructed



Modern House, Prairie Avenue, Chicago.  
(From Scribner's Magazine.)

of wood. In spite of this fact, little seems to have been done, as might have been expected, toward developing an architecture of wood. All sorts of architectural styles, originating in stone, have been adopted bodily in wood, with scarcely a change in the original stone expression except such as is absolutely necessary for the jointing of a different material. California and other parts of the Pacific coast are blessed, in so far as their wood houses are concerned, in their beautiful red-wood. This is a lovely colour for interior, as well as exterior work. Its effect, when used outside in shingles and otherwise, and treated with spar varnish, is singularly fine, presenting to the eye a fine leathery texture. This wood is not difficult to work, and when used with intelligence and discretion should be made to contribute, in a great degree, to the development of new forms of design in wood.

The houses mentioned above, like all typical Western dwellings, are better finished within than their exterior would seem to indicate. The reverse of this is seldom true, and this is a good deal to say for the certain honesty in Western cities, where the occupant of the house is less interested in making a specious display to his neighbours than in acquiring a solid and enduring comfort for himself. Native hard-woods are freely used, especially white and red

oak, both quartered and plain. These woods have been especially popular; their beautiful grain and open texture lend themselves to so many effects of colour that they have taken the place of other wood, the colour required being imparted to them by filling and staining; indeed, their use has become so general that the supply threatens to be exhausted, and their market value has increased during the last few years nearly double. From California come several beautiful,—if rather showy,—woods, in yellows and reds. The manilla-wood from the coast has much of the beauty of mahogany, with its deep red tones and waving grain. Curiously enough, when we have practically abandoned in the West the use of American black walnut, which at one time was employed far more than any other native hard wood, and are now beginning to use so freely the English oak, the very 'swell thing' in England seems to be to abandon the use of their beautiful oak and substitute instead our American black walnut.

Much more may be said of the interior aspect of these Western dwellings, which is as varied as their exterior designs, or as the temperament and social position and disposition of the occupant.

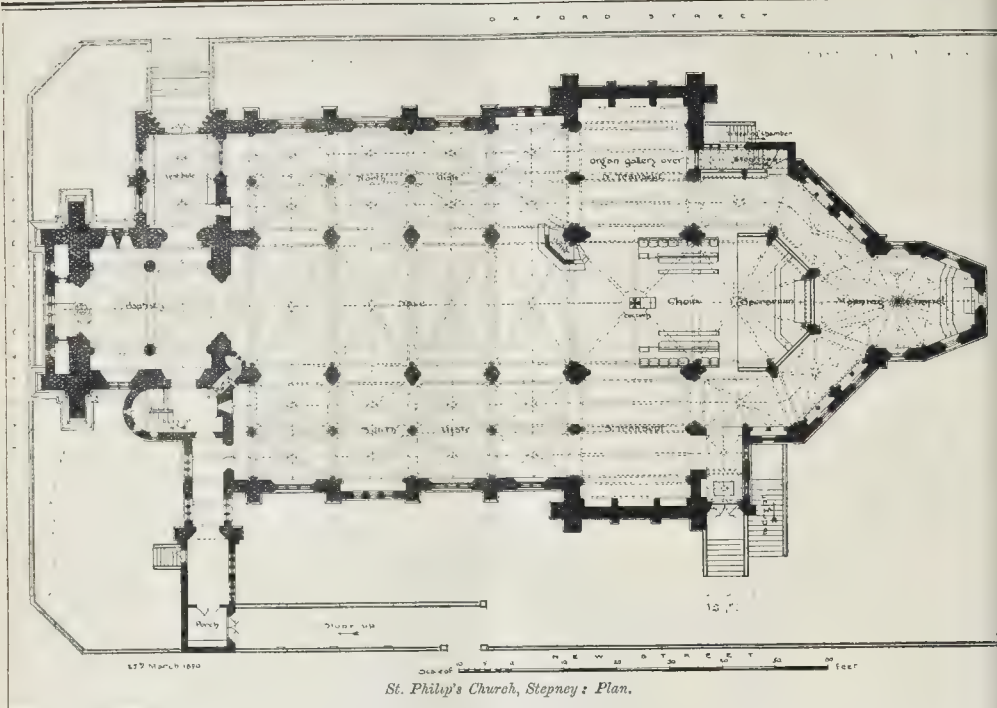
Again let me say, that between the character of the occupant and the general expression of the dwelling there is much greater similarity than in any other part of the country. The one is much less governed by artificial conditions than his brother in the East, and very much more freely expresses himself.

A few years back, and contemporaneous with the reign of, first, the 'Victorian Gothic' and afterward the 'Queen Anne', was the reign of marvellous wall-paper, portières, *bric-à-brac*, and 'Eastlake' furniture. To all of these the West gave swift obedience. Houses may still be found in abundance where each of these sovereigns holds divided sway; but in the main common-sense has won the day, or at least other and less artificial fads now rule. First the embroidered, carved, painted, cast and wrought iron crane, who so long stood on one leg amid surrounding cat-tails, has died; the death was prolonged and painful, but seems finally to have occurred. After this, the famous, honestly-constructed, glued-on, mortise-and-tenon furniture fell to pieces and went to the cellar; then, as intelligence increased, the people began to purchase pictures of interest and beauty, and ceased to paste pictures of no interest and beauty on their walls and ceilings. After this came a yearning for more sunlight and fresh air, and heavy stuffs were largely removed from doorways and windows, and lighter materials substituted. Last of all, the indiscriminate vase and plaque, the ubiquitous display of cups and saucers, have given way to temperateness in this as in other things. Even 'stained glass, which in the West has for many years run a most shameless career, has grown less wild and uncivilised, exchanging its barbaric hues for gentler whites and opals.

Take it altogether, the outlook for Western city houses seems most promising. Western people themselves are becoming, and will still more become, almost ideal clients. It is true that, as in the East, Western city dwellings have not escaped the deadly touch of the 'know-it-all' client, nor of the man who is 'building the house to suit himself,' nor of him who 'is going to live inside the house, not outside,' and who is, therefore, loftily indifferent to the street aspect of his house; but each, even the last person, is becoming infrequent. In the past, and to some degree at present, Western cities have been and been influenced by men whose lives have been absorbed by things too material to leave them much leisure for art; but even in the case of such men there is a marked indisposition to dictate in directions where their knowledge is incomplete. They have a large openness and unbiased attitude of mind, and a genuine and earnest desire to 'get the best.' In the West is less often found than in the East the 'aesthetic crank,' and it is also true that life in the West is less conventional, freer, less restrained by artificial restrictions than in older communities, and the true nature of people and things is, perhaps, more frankly expressed.

All of these conditions are helps to the architect, for while they free him from such artificialities as might tend to hamper him, or to make his work more formal, they give wholesome impetus to honest and earnest endeavour.





St. Philip's Church, Stepney: Plan.

Circumstances are also such that the architect may act with great catholicity. Architectural tradition in the West there is none. Even from such practices as may exist in the East, the West will often hesitate to borrow; and among the various Western cities, marked tendencies towards divergence, not only from the East, but among themselves, may be noted. Thus contemporaneous work in St. Paul and Minneapolis will differ in marked degree from similar work in Omaha or Denver; and the dwelling-houses now erected in Chicago have marked peculiarities not to be found in other cities. These variations are due to great differences of climate and customs, as well as to differences of temperament among both clients and architects, for the enormous size of 'the West' must be borne in mind when considering this great architectural development. Among these various rival cities dominant 'fads' in architecture are likely to become less common, and problems will be more generally determined by the nature of the case."

### Illustrations.

#### "THE DANAIDES": DESIGN FOR MURAL DECORATION.

**T**HIS design, by Miss May Bowley, occupied a central place in the Architectural Room at the last Royal Academy exhibition. The drawing is an illustration of the ancient legend of the Danaides, the princesses who were condemned for ever to draw water in vessels with holes in the bottom. It was intended by the artist, however, to express a further meaning, as symbolising "Labour," but that kind of labour which is hopeless and ends in no useful result.

#### ST. PHILIP'S CHURCH, STEPNEY.

This church, at the back of the London Hospital, Whitechapel, is now being built from the designs of Mr. Arthur Cawston.

The western half, including the western transept piers, has been finished about a year, and is used for services, as shown by our illustrations. The eastern portion is now being built, and the contract time for completion is August, 1891.

Mr. T. Higgs, who superintended the erection of the western portion, is again the clerk of works, and Messrs. A. Bush & Sons are the builders.

Our interior views are printed from photographs taken by Mr. Charles Latham.

The instructions given to the architect when he was first called upon to design this building, were that it was not to be a strictly utilitarian building, crowded with seats everywhere, like a meeting-house, a concert-hall, or even an ordinary modern parish church, but it was to be, if possible, a building worthy of the great purpose to which it is put; an interesting place for the parishioners to rest and hide themselves for a time from their neighbours, and a permanent protest in this practical age against the everlasting question, "Will it pay?"

It is for these reasons that in this small parish this church has double aisles, but a narrow nave, and short choir; for these reasons that the windows are kept small, and their light dimmed; that the north-west door is not in ordinary use, but that the entrance is by a cloister, which, when completed, will probably run the whole length of the south side.

It is to give interest to the building that the Morning Chapel is hidden away as much as possible in the east end, so that it cannot be immediately seen by any one who enters the church. In fact, by whichever door the church is entered, it was intended that there should always be one thing of interest which required a walk right into the building before it could be seen.

The building, as originally designed, had one bay more length in the choir; but when the east end was being commenced the size had to be curtailed, and a visit to St. Denis, near Paris, where the chancel and many handsome steps up to it project boldly out beyond the transept piers, suggested this arrangement, which is also found in some few of our English Cathedrals.

No steps are shown on the plan between the choir and the nave, but this, to some minds, is an advantage.

A glance at the plan of Wells Cathedral will dispel the fear that the shape of the Morning Chapel is original. The centre pier here is to be polished Hopton Wood stone, to support the many irregular ribs of vaulting that will spring from it, and the walls of the chapel will be faced with Sussex stone from Mr. Whitehead's quarry, near Three Bridges, a stone which has often been used with success by the architect.

The surface will be rock-faced, and, of course, the stones will be kept small in size.

The remainder of the church internally is faced with common stock bricks, freely relieved with Bath stone, as in Mr. Pearson's church in Red Lion-square. Externally the materials are red brick and Ancaster stone; but, in view of the surroundings and for other reasons, it was not thought desirable to ornament the exterior.

Should any of our readers visit the neighbourhood we would call their attention particularly to the wonderful transformation recently made just at the east end of the building. What was once a dust-heap is now a miniature garden, with its artificial lake, rivulet, and bridges, its menageries and its grottoes. It is surrounded by a high paling to ensure quiet, and is reserved for the old people of the parish.

A. C.

#### SKETCHES AT THE ARTS AND CRAFTS EXHIBITION.

The sketches given in this plate, representing various objects in the Arts and Crafts Exhibition, are referred to and commented on in the article on the exhibition in another column.

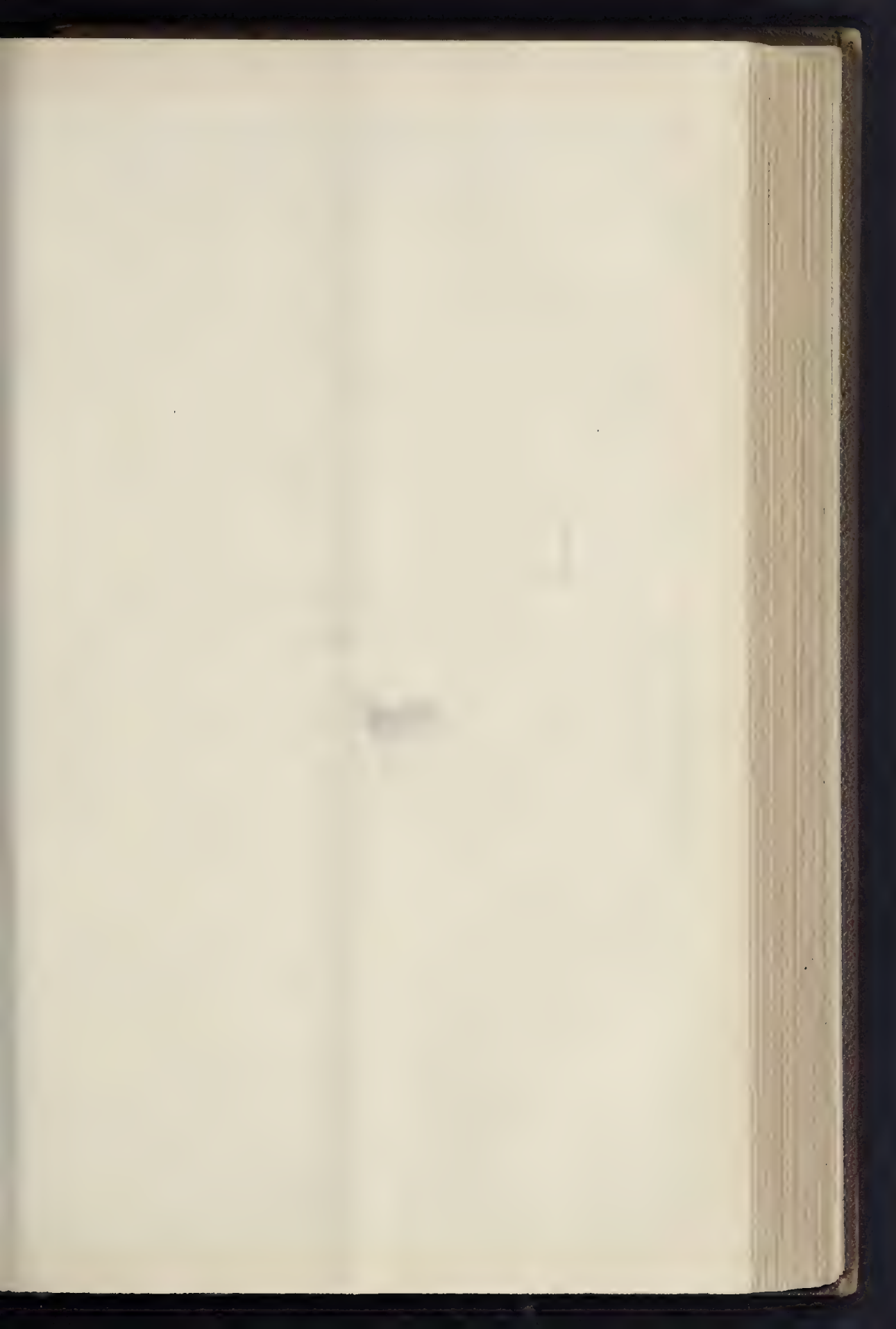
#### THE CASE OR SHRINE OF ST. PATRICK'S BELL.

The ancient Celtic Church had the peculiarity, not shared by other Churches, of possessing various small bells which appear to have belonged to the earliest of her ecclesiastics. Much respect was afterwards shown to these objects, as is evidenced by the care with which they were preserved, in many cases shrines of great beauty and value being provided for their reception, while special keepers, generation after generation, had charge of the sacred objects.

The greatest number of these bells are found in Ireland, but many are preserved in Scotland, a few in Wales, but only two are known to exist in England. They are always of small size, being clearly hand or portable bells, resembling in their general form those of ancient Roman date, examples of which are not uncommon, and from which they were most probably derived.

What may reasonably be considered as the earliest examples are formed of sheets of thin iron, the edges of which are lapped and riveted together after having been bent to the intended







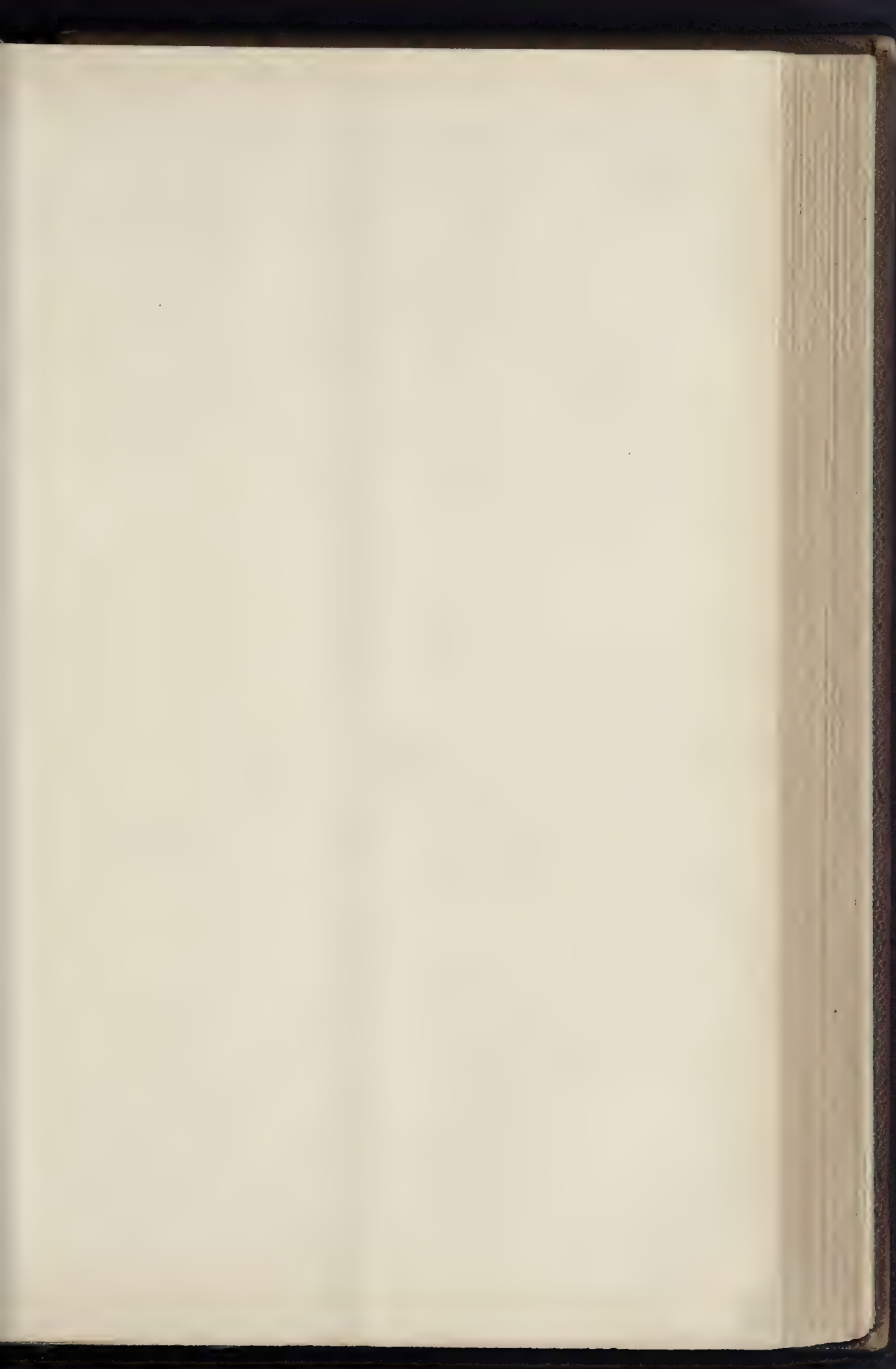




RATION—By MISS MAY BOWLEY.







THE BUILDER OCTOBER 11, 1890.



VIEW IN SOUTH AISLE OF NAVE.



VIEW IN NORTH AISLE OF NAVE.





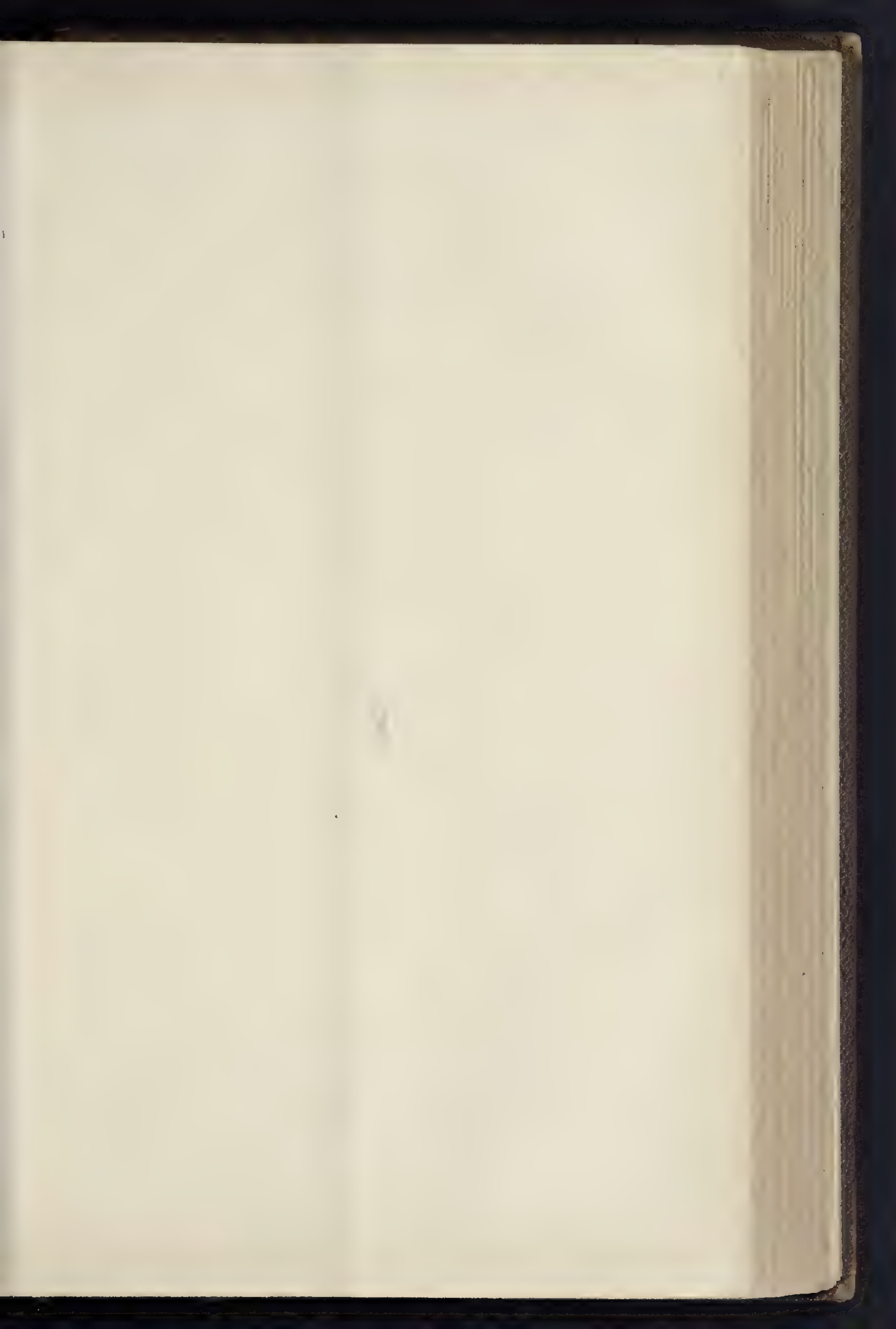
LOOKING INTO NAVE FROM BAPTISTERY.



PART OF BAPTISTERY AND VESTIBULE.





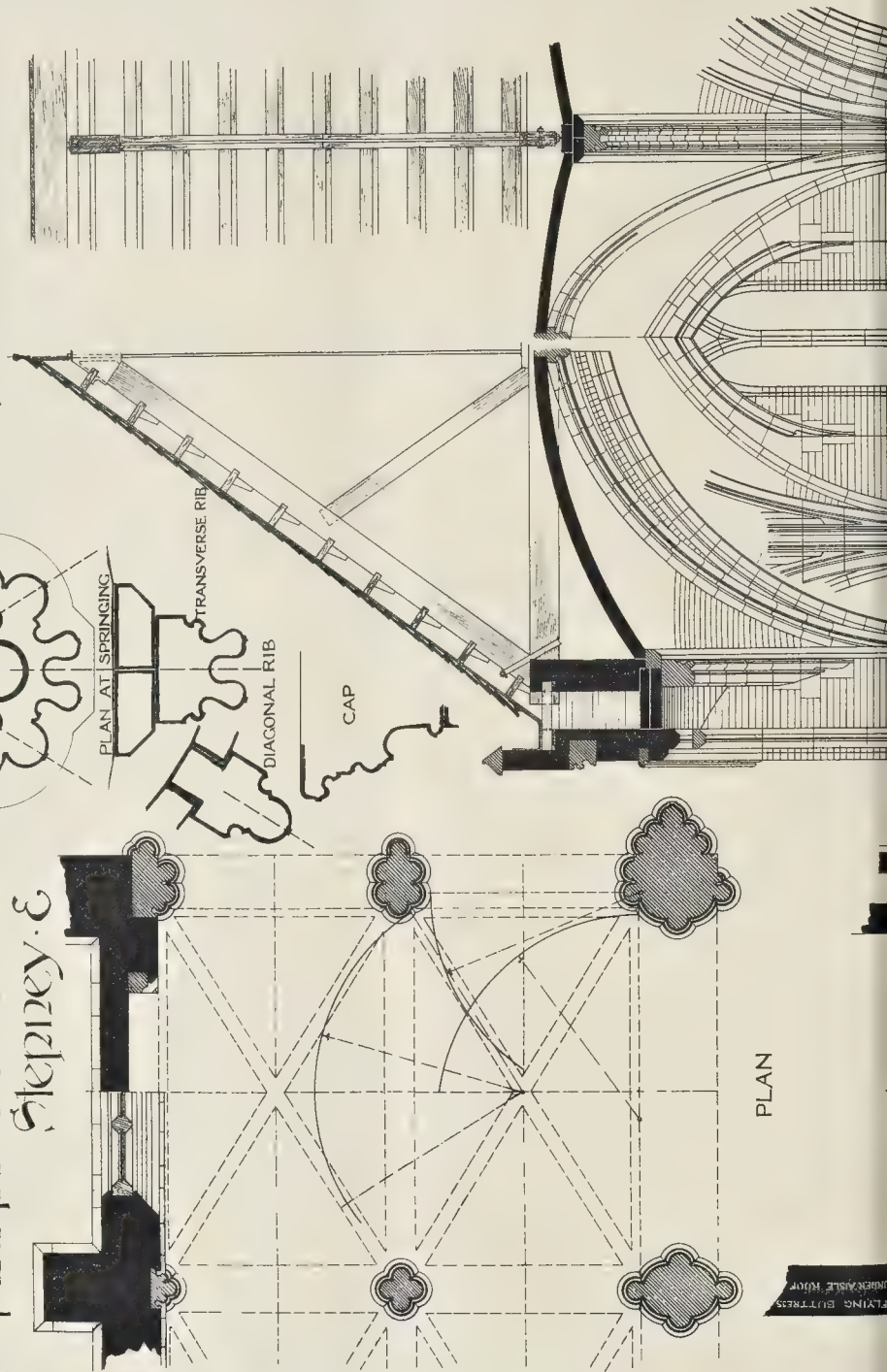


THE BUILDER, OCTOBER 11, 1890

# St Philip's Church Stepney. E

LINE OF WALL

W. A. COTTON, F.R.I.B.A. Architect



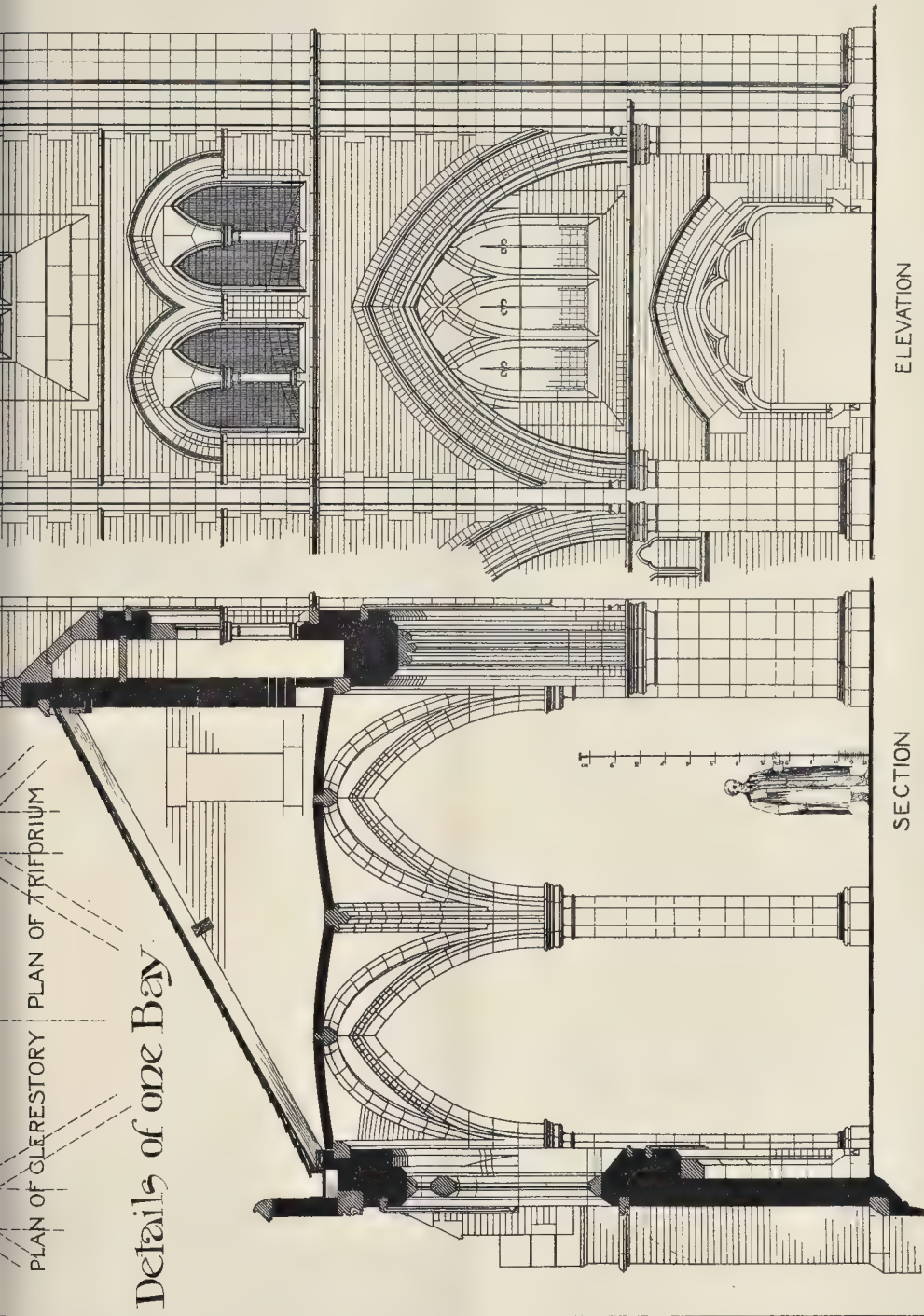
PLAN

FLYING BUTTRESS  
UNDER AISLE ROOF



PLAN OF CLERESTORY PLAN OF TRIFORIUM

Details of one Bay



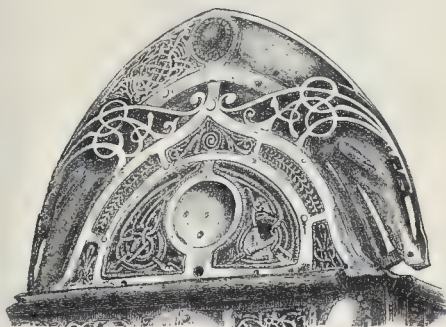
ELEVATION

SECTION

PHOTOGRAPHED BY THE ARCHITECTURAL PHOTOGRAPHIC CO. NEW YORK





*Shrine of St. Patrick's Bell.**Detail of Head of Shrine.*

form. The joints were then filled in with bronze, and the bell itself dipped into liquid bronze, and thus coated with that material, after the manner practised in the manufacture of sheep-bells in Wiltshire. Another variety, probably of later date, is of cast bronze. An approximately dated example of this latter class,—the bell of Armagh,—was fabricated before A.D. 904.

Our illustration represents the celebrated case of the bell of St. Patrick, which, for the extreme beauty and minuteness of its workmanship, is the finest and most worthy of study of all the bell-shrines remaining in the kingdom. It is formed of bronze, the corners being secured by copper flutings. On this groundwork are riveted the gold and silver panels which contain the mass of decoration, of which the more salient features only are possible to be shown by the engravings. The precious stones and glass remind us of the bindings of some of the earliest MSS.

The upper portion, shown more in detail, is of elaborate work in silver and gold. The sides consist of similar work, of different design on each side, of great elaboration and beauty, which has to be seen to be fully appreciated, the minute and intricate nature of the entwined spirals being difficult to follow. Some of these have heads, the eyes of which are filled in with minute specks of green glass. Rings for suspension exist on both sides springing from crosses; the back consists of a diaper of Greek crosses; while around the margin is an inscription in Irish, asking for a prayer for the maker of the bell, for Donald, the successor of St. Patrick, for whom it was made, for the keeper of the bell and others. From the occurrence of some of the names in the annals of the Four Masters, the date of the shrine has been assigned to between 1091 and 1105, but it will be noticed that many of the patterns are of early form. The history of the descent of the bell and its case from one generation of custodians to another is remarkable and curious, but it need not be repeated here. Both are now among the most precious of the contents of the Museum of the Royal Irish Academy, Dublin.

The bell contained within this beautiful case is perhaps the most ancient of its class now existing in Ireland. It is formed of plates of iron, dipped in bronze as already described, and is of small dimensions, the height being only 7½ in., including its flat bow handle. The width at the mouth is 4½ by 3½ in., and the total weight is 3 lb. 11 oz. There is nothing whatever on the bell itself to connect it with St. Patrick; but the reverence which has been shown to it by the preparation of the costly case which enshrines it, the careful keeping which it has received through so many hundreds of years, and the name given to it by tradition

during all this period, are important elements in support of its title to be considered, indeed, as a personal relic of Ireland's Apostle.

A charming monograph of the bell and its case, with full-sized plates printed in colours, has been published by Marcus Ward & Co., with a description by Dr. Reeves.

#### THE COMPETITION FOR THE WHITEFIELD MEMORIAL CHAPEL AND TOP-LADY HALL, TOTTENHAM COURT-ROAD.

The old building, which was once a landmark in the Tottenham Court-road, has been lately removed and the site cleared for the erection of a new building. The Committee decided upon a limited competition, in which the assessor, Prof. T. Roger Smith, has recently published his award, the drawings being exhibited in the temporary school-room in the Tottenham Court-road.

Ten firms of architects were invited to compete, and the instructions were supplied together with a plan. The plan, however, has given rise to a good deal of comment and a letter in our last issue from a "Competitor."

The site is rectangular in shape, with a rectangular addition at one corner. The breadth, however, in Tottenham Court-road is wrongly figured to the extent of 6 ft.; 102 ft. is figured, whilst the existing dimension is 108 ft.

We cannot too severely condemn the carelessness of the Committee in furnishing a plan which is misleading in such an important point; we also sympathise with the competitors who, having followed these faulty instructions, now find themselves at a disadvantage.

On the other hand, we cannot refrain from pointing out to all the competitors that this error is apparent on a cursory examination of the plan, and without measurement of the site itself, for by comparing the dimension in Whitefield-street, 133 ft., less the break, figured 25 ft., the result is 108 ft.; whereas 102 ft. is figured, and all the angles are drawn as right-angles. How, then, is it that in plotting the site, every competitor did not immediately ask for the Committee's explanation? We are surprised that only two competitors took advantage of the extra 6 ft.

The requirements of the instructions included the provision of a chapel to seat 1,500, a school-room beneath it to accommodate 1,000 scholars, and other rooms. These, with a caretaker's residence, were to be placed at the back of the site, abutting on Whitefield-street, whilst the front portion, facing Tottenham Court-road, was to be provided with offices for letting, a church-parlour, ladies' cloak-room, secretary's office, and class-rooms. The first floor of the front portion was to contain a hall with galleries

to accommodate 1,500. For all the accommodation asked for the cost was not to exceed 15,000*l.*, which will probably prove to be an altogether inadequate sum.

The plans to which the first place has been awarded were prepared by Mr. F. Boreham, of Finsbury-pavement, under the device of a "winged heart," and he took advantage of the additional 6 ft. already mentioned.

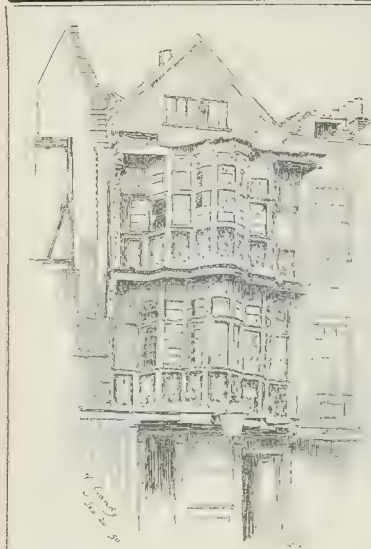
A spacious entrance in the centre of the Tottenham Court-road front, which is flanked on either side by three offices, leads into a hall which has two class-rooms on the south and a church parlour on the right, also secretary's office and ladies' cloak-room. Areas are provided between the two blocks, and on each side of the passage, which leads direct into the chapel, are placed staircases leading to the Top Lady Hall. The chapel lies north and south, with the pulpit, organ, and choir at the north end. The entrances at the south, which appear to be very narrow, are flanked by staircases leading to the gallery above, but no means appears to have been provided at this end for getting from the ground-floor to the galleries without going outside the building. The pastor's and other vestries are placed in a convenient position on the ground-floor of the caretaker's house, but lavatory accommodation is conspicuous by its absence. The hall on the first floor is spacious and well lighted.

The plan of these buildings is decidedly the most creditable part of the design. The elevations are not pleasing, designed as they are in that singular style, too often met with in dissenting places of worship, which abounds in semicircles and circles. The building is not one which will cover the art of architecture with glory, and we doubt whether it will give continual joy to any Committee, though art, worthy of the name, be to it a closed book.

It is with relief and satisfaction that the attention is directed to the design which has had the misfortune to be placed second in this competition, and which has been carefully prepared by Mr. J. M. Brydon, under the motto "Lux Mundi." The plan shows a central entrance from Tottenham Court-road, with two offices in each side. The corners of the front are occupied by circular staircases leading to Top Lady Hall. The hall is continued through to the chapel and has staircases on each side, which serve both the hall and gallery of chapel.

It is the interior of the chapel that is particularly charming in its treatment. Almost square in plan, the centre is carried up on columns at the angles of a hexagon to form a dome, which is treated with much grace and refinement. The pulpit has been placed on one side of the hexagon, the aisles radiate from this point, and the seating is arranged amphitheatrically. The first floor is occupied in front by the hall, with exit stairs at each corner of





Bishopsgate-Street-Without

First Floor Plan  
Pindar's House

the front wall already mentioned. Two doors open on to the landing of a spacious staircase between the two blocks.

The elevations are very refined in the treatment of the English Seventeenth Century style accepted. It is presumed that terra-cotta would have been used in conjunction with a quiet tone of red brick. The building, had it been erected from this design, would have graced the important position of the site.

The names of the owners of the remaining drawings exhibited not having transpired, we are obliged to refer to them by motto. They are—Saxis, Arcanus, Forward, Hearing and Seeing, Lux, Red Cross, Spero, Wisdom Strength and Beauty.

The design submitted by "Saxis" is an interesting study, and certainly ranks high amongst any of those sent in.

The question of cost is, however, unfortunately always to the fore, and though the author proposes to omit the tower, the design would be too costly for the funds available. We certainly think the perspective most pleasing, and the position allotted to the tower a good one.

We do not feel disposed to take notice of any of the remaining designs, some are better than others, and some are very poor.

It is, perhaps, not to be expected in this prosaic age that an effort would be made, or extra expense incurred, by a Committee to erect a building worthy of an important position. It should be remembered, however, that the site is an important one, occupying a large frontage in a wide thoroughfare, and with large open spaces on each side, which greatly enhance its value, and it is to be regretted that this opportunity of erecting a building which would be a bright feature in one of the dreariest streets in the metropolis should be thrown away.

The Committee is endeavouring to obtain too much accommodation for its money, and we sympathise with the assessor in being driven to place economical mediocrity in front of artistic merit.

PLANE TREES IN LONDON THOROUGHFARES.—The Metropolitan Public Gardens Association has offered 100l. each to twenty Metropolitan Vestries and District Boards, to be expended in planting plane trees in suitable public thoroughfares in each district, on condition that the local authorities agree to maintain the trees when planted, replacing such as may die. The Association is willing to do the planting itself should any Vestry so prefer. The chief requisites for success are thoroughfares of sufficient width (say not less than 40 ft.), plenty of good soil to each tree, and the avoidance of gas mains as far as possible.

#### THE "SIR PAUL PINDAR" TAVERN, BISHOPSGATE-STREET.

As we mentioned in a "Note" in our issue of the 13th ult., the picturesque old house in Bishopsgate-street-without, known as the "Sir Paul Pindar" tavern, has been doomed to destruction by the extension eastward of the Liverpool-street terminus of the Great Eastern Railway,—a work, by the way, which necessitates the pulling-down of nearly the whole of the western side of Bishopsgate-street-without. The tavern is stated to be the remnant of the house of Sir Paul Pindar, a contemporary of Sir Thomas Gresham. One of the two sketches by Mr. W. Gandy, which we append, faithfully shows the appearance of the front of the house as it has been of late years; the second sketch gives a view of the interior of the first-floor room. The old house-front, with its greatly-projecting bow-windows, was one of the most picturesque bits of old London.

#### THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday at Spring-gardens, Sir John Lubbock in the chair.

*Finance and Technical Education.*—Lord Lingen, Chairman of the Finance Committee, presented a revised estimate of the contributions required to be levied for the year ending March 31, 1891, explaining at considerable length the reason for the revised estimates. It appeared that a revision of the estimates, approved by the Council in April last, had become necessary as certain charges in respect of pauper lunatics, industrial schools, coroners, &c., which it was estimated would fall upon the General County Account had, by arrangement with the Guardians of the City of London Union and the Corporation of the City of London, been transferred to the Special County Account. This alteration reduced the amount required from parishes within the City. There had been an increase of the Exchequer Contribution through the legislation of last session, by which a proportion of the new taxes on beer and spirits become payable to the County. The whole sum expected to be thus received within the financial year 1890-91 was 140,000l. As a set off against this increased receipt there was the sum of 74,532l. portion of Probate and Licence Duties estimated for in April, but not now expected to be received till after the close of the financial year; 10,250l. estimated decrease of such duties and increased charge thereon; and 10,847l. increased working balances carried

forward to next year. The remainder was accounted for by differences of estimated receipts and expenditure and reduction in the amount to be levied by rate in the City parishes. Of the total Exchequer contribution for 1890-91 there would be receivable after the close of the year the sum of 136,124l. The result of the revision of the estimates was that as regards the parishes outside the City, the contribution required for the second six months would be at the same rate in the pound as for the first six months of the financial year, viz., 6-625d., and as regards the parishes within the City, the contribution would be equivalent to a rate of 4-875d. in the pound, as compared with 6-25d. for the first six months.

The Committee recommended that the amount required to be raised in the second six months should be for the General County account 641,569l., and for the Special County account 202,073l., and "that the Council do appoint Tuesday, October 14, to pass an order for the making of a County rate of 4½d. in the pound for General County purposes, and 1½d. in the pound for Special County purposes."

The Committee referred to the Act which enables the Council to contribute the whole or part of the grant arising from the new taxes on beer and spirits for the purposes of technical education, within the meaning of the Technical Instruction Act, 1889. The amount expected to be realised within the present financial year was 140,000l. This sum had been included in the receipts on which the estimated rate for the second half of the current year was based. But the ultimate application of any such receipts, if renewed in the present or any equivalent form, required careful inquiry and consideration, and the Committee recommended—

"That a Special Committee be appointed to consider the subject, with express reference to the question whether any, and, if any, what proportion of such further amount as may be received pursuant to the said Act, should be applied to technical education."

With reference to the second recommendation of the Committee, which was taken first, Lord Lingen referred to an amendment which was to be moved by Mr. Spicer in favour of devoting the money, or a portion of it, to the promotion of technical education. He (Lord Lingen) was against applying any portion of those funds to a suspense account. Mr. Spicer had selected one of the most urgent subjects with which they could have to deal; but there were other matters which loomed before them in the near future. There was the water question; then again, they had not laid the ghost of the Thames Tunnel; there would be further expenses, at no very distant date, at Barking



outfall, where the sewage was creating a bar and poisoning the water; there was the question of the dwellings of the working classes, and also that of open spaces. The function of the County Council was to look to the health and convenience of the people of London rather than to that of education, to deal with which there was the London School Board.

Colonel Hughes remarked that if the 140,000 had not come to their aid, the rates would have gone up one penny in the pound, and he objected to the money, which it was the obvious intention of Parliament should be devoted to some special object, being applied to the reduction of the rates in general.

Mr. Campbell said that the money should be kept separate from the rates. He thought they would be untrue to the welfare of the people at large if they applied it to reduce the rates.

Mr. Evan Spicer then moved—

"That a special committee be appointed to consider the subject of technical education, and that until such a committee has reported, the sum of 50,000*l.*, part of the estimated produce of the new beer and spirit tax, be carried to a suspense account, and the balance of 125,000*l.* standing to the general county account, be reduced by that amount."

He had, he said, originally intended to propose that the whole sum should be set aside, and he was still of opinion that the Finance Committee ought not to have appropriated it to relieve the rates; but as that had been done, and an extra penny would have to be levied as an alternative, he compromised the matter for fear that it would forth that the increase in the rates was owing to technical education. What had we in London at the present time in the way of technical education? Beyond the efforts of a few philanthropic gentlemen, conspicuous among whom was Mr. Quintin Hogg, the Technical College at Finsbury, and one or two other smaller institutions, no provision was made for affording technical education. If the sum were applied to the purpose suggested it would be paid to them every year, and if used in a proper manner the Government would no more think of stopping his grant than the South Kensington grant.

Mr. Donbleday seconded the amendment.

Mr. Burns said that technical education was not a local question for that Council to consider, but an Imperial question, which the State, through the various school boards, ought to see to; and anything short of 20,000,000*l.* towards such an object would be tampering with the question as he understood it.

After a long discussion, during which Lordingen admitted that an extra rate of a penny would be necessary if the 140,000*l.* were not used in the manner suggested by the Committee, the amendment was lost by a large majority. Two other amendments were also lost, after which the recommendations of the Finance Committee were approved.

*London street Advertisements.*—On the motion of Mr. Marks the following resolution was carried:—

"That it be referred to the Local Government and Sanitation Committee to consider and report how the Council can best acquire the power to control and regulate the business of advertising on hoardings in London, by the granting of licences, the proceeds of which should go in relief of the County rates."

The Council soon after adjourned.

## Books.

*Encyclopédie de l'Architecture et de Construction.* Vol. IV. Premier fascicule. Directeur, P. PLANAT. Paris; Dujardin et Cie.

THE fourth volume of the *Encyclopédie* opens with a long article on "Contrefort," tracing the transmission of the column into the buttress, with numerous illustrations. "Corniche" is a subject of a fairly illustrative article, hardly perhaps so complete as so large and important an architectural feature seems to demand. This mark applies more strongly to the article on "Coupoles," signed by M. Alphonse Gosset. By such a subject should be dismissed with scarcely any illustrations it is not easy to understand, except that in dictionary work generally an editor is necessarily a good deal dependent on a good will and convenience of his contributor, dictionary writing being usually a very haphazard class of work to undertake. "Crypte" is a very largely illustrated article; the illustrations are, as usual, drawn almost entirely from French monuments, which is the defect of

the work throughout; it is a dictionary of French architecture rather than a dictionary of architecture. "Distribution d'Eau" is well treated by M. L. Borne. The article on "Egine" is very well illustrated, with a restoration of the temple of Egina by M. Charles Garnier. "Eglise" would seem a subject rather for a book than a dictionary article; the writer states that he limits himself to marking, in a more precise manner than in the article "Cathédrale," and by some new examples, the origin and first developments of religious architecture "sur notre sol," in this case avowedly limiting it to French work. This exclusive nationality of feeling in such a book is to be regretted, because it limits the scope and usefulness of what is nevertheless a very remarkable publication of its kind, which we are glad to see is fast progressing.

*Guns and Gun Material.* By GEORGE EDE. London: E. & F. N. Spon. 1889.

THIS is an interesting little book, and not the least interesting part of it is its introduction, in which the author, who has been engaged all his life in forging weapons of war, laments the necessity for their manufacture, but, whilst advocating the advantages to be derived from international courts of arbitration, still holds that "in the present state of the majority of the human race, and while it remains the custom to fight first and reason afterwards, war will be best prevented by nations appealing to the fears of each other; such as by continuing in their present course of endeavouring to thoroughly equip themselves with the most destructive weapons."

Mr. Ede has worked for many years in the Royal Arsenal at Woolwich, and is already known as the author of a little work of some repute on "The Management of Steel." He is therefore a competent person to treat on a subject with which he has so long been practically connected. Let us see what he has to tell us, for he has "come to the conclusion that the science of gun-making, even in our own country, is considerably behind other sections of science," and he very truly remarks that "finality has not been reached." He demonstrates that steel is the only possible material which, with our present knowledge, could justifiably be used for guns, and the present work is in some respects supplementary to that above quoted. The object of the work is apparently to induce the Government of this country to conduct experiments which shall, in the opinion of the author, be more satisfactory than those hitherto carried out for testing the nature and properties of the steel supplied for gun manufacture, for he considers that we are so much in the dark on those points that no one can draw up a specification for steel for guns which is based on anything much exceeding guesswork. He recommends the supply and testing of 147 barrels of all sizes, divided into batches of 21, supplied by seven different steel manufacturers, and he enters into as much detail as is possible in a work of seventy-four small octavo pages (of a comfortable-sized type) in respect to the subsequent treatment and mode of completion of each sub-division of each batch of this rather considerable stock of ordnance, which is to be provided for testing purposes only, and with the sole object of enabling a reliable specification for gun steel to be prepared. He is not to be deterred by the question of cost, though he anticipates opposition from some quarters, but he dismisses this with the observation that "if it be conceded that the really expensive experiments are those from which nothing valuable can be obtained, and that those which I have suggested are proper, and under present circumstances necessary, then I think, considering how much they promise in the interest of all, they should be carried out."

This is, of course, the crux of the matter, and, whether M. Ede be successful or not in his tournament, we commend the terseness of the style and the simplicity of the language with which he pleads his case.

*Hamburg und Seine Bauten.* Edited by the Architekten-und-Ingenieur-Verein zu Hamburg. 1890. Publishers' Agents: O. Meissner, Hamburg.

SINCE 1864 we hear of descriptions of German cities being published on occasion of their being selected as meeting-places of the biennial gatherings of the architectural and civil engineering societies (see p. 205, ante), and these descriptions, although commenced in the

modest form of a guide-book, have gradually attained such dimensions that we now find every two years bulky volumes in relation to Berlin, Dresden, Cologne, Frankfurt, and their buildings, of 600 to 800 pages each, before us, containing no more the superficial sketch, but a professional and technical description which even goes into important detail.

This year Hamburg has had its turn (or rather second turn, as in 1868 it had a book of 160 pages). We find the "description" of this most agreeable of all North-Germans cities in the shape of a 730 page volume, edited by a committee of sixteen members of the Hamburg Arch. and Ing. Verein, adorned with no less than 1,377 illustrations. The book, as the introduction says, has been written by members unused to literary labour, in German characters (yet with many a French phrase not admitted under the present regime) for Germans, and not for international criticism. It has been divided into the three main sections:—1, history; 2, public work; 3, private work; and each of these three groups has been very fully treated. The historical introduction, written in one chapter, shows us the gradual progress made from the year 811 up to date, and, besides having a good supply of old maps and views reproduced, also has a paragraph of statistical matter. The second section, public work, has been divided into thirty-four sub-divisions, each treating of some distinct subject, pertaining to public works in civil engineering or architecture. The third and last section embraces all private work, the business premises in the city, the stores, hotels and mansions, the residences and villas of the suburbs, and the factories and labourers' dwellings outside the town. We can recommend this book, as well as its predecessors dealing with other cities, as a valuable addition to any reference library.

## Correspondence.

To the Editor of THE BUILDER.

THE FIRE AT SALONIKA.

SIR,—Three or four months ago you were good enough to insert, and, still more, to recommend by an editorial note, a letter from me calling the attention of architects and archaeologists to the work which was being done by the British School at Athens in the investigation of the Byzantine antiquities of Greece, and inviting subscriptions in aid of that effort.

Although that particular invitation has not met with the response I had ventured to hope for, I am encouraged to renew the appeal under present circumstances. Our architectural students have just been directed to proceed to Salonika for the purpose of carefully examining the ruins and recovering as much as possible from the buildings there, which, it is well known, take the very highest rank in Byzantine architecture, and which are now subjected to a double danger, namely, that of utter destruction if neglected for even a short time on the one hand, and from the great perils incident to restoration on the other. The work already done by the two artists referred to (Messrs. Schultz and Barnsley) has earned the highest possible praise from those who have seen what they have done; but funds are sadly needed to enable them to devote a sufficient time to this very interesting expedition. I need scarcely say that, for their own sake, the School Committee will be anxious to make the results they may arrive at as public as possible. Subscriptions will be received either by Walter Leaf Esq., Old Change, E.C., or by your obedient servant, F. C. PENROSE.

68, St. Paul's-churchyard.

## "AN EMPLOYERS' UNION."

SIR,—It does not say very much for the vitality or scope of the Central Association of Master Builders that, although employing from 400 to 500 hands, comprising largely joiners, polishers, smiths, labourers, &c., and being as you state, Sir, a well-known firm, not the least invitation to join its ranks, not even a circular, has ever reached us from that body, so far as we can remember, since its inception.

The sooner the auxiliary trades receive an invitation to join this Association, if it is the best existent, the better for them and also for the Association itself, which cannot be too strong.

Large cabinet-making firms, furniture makers, and shop-fitters employ amongst them a very large number of joiners, polishers, &c., but in the event of a strike, however unreasonable, they would pro-



bably be beaten in detail through utter unpreparedness—witness the late strike of French polishers—a body of men considerably overpaid at 3d. per hour, at least by comparison with skilled joiners at 9d., who have to serve a longer apprenticeship and maintain a kit of tools. It is, therefore, highly important either that these allied trades form a union of their own, or that they join the Central Association of Master Builders, if the latter can adapt its regulations to suit the slightly varying classes and rates of labour prevalent amongst the branches we mention.

CONTRACTORS.

#### "A SANITARY NOTE FROM GREENOCK."

SIR,—In reply to the letter from Mr. Ernest van Putten, on p. 272 of to-day's issue, I beg to say that I did not state that the chief object of a disconnecting syphon was to keep out rats, but that this was one of its important uses. Mr. van Putten thinks that allowing the rats free access into the house drains would do no harm. I think he is wrong, for they could eat through any lead pipes they could get at, and they can sometimes run up inside of the pipes and so get into the house. The plumbers and masons sometimes when working at houses leave pipes open, or partly so, when both sewer smells and rats might get into the house if there was no disconnecting on the drain.

Mr. van Putten is wrong in supposing the "continuous" flow in the sewers is such as to prevent smells, for after a rain, or, as sometimes it is later, the flow of the water in the sewers will be much less than during the day, whereupon smells, &c., rise from the sewage exposed to the air between the high and low-water marks.

Mr. van Putten does well to mention that the unsanitary two-gallon closet flushings are unable to wash the soil properly along the drain; but this is no argument for adding the bad smells from the sewer to the drain smells, but goes to show that four-gallon flushes for the closets should be the rule, and that all closet cisterns should have capacity for several two-gallon flushes without waiting till the cistern fills.

Mr. van Putten is wrong in supposing there would be no extra danger incurred by dispensing with the disconnecting trap on the drain, for earthenware closets are easily broken, and many have too little water-lock, while there is danger of sewer air conveying fever germs. Dr. J. B. Russell, Medical Officer of Health, Glasgow, is of the same opinion with me as to this, and could quote instances of fever so produced.

Mr. van Putten seems to me to have had very little experience in house drainage and plumbers' work when he reiterates that "the air in a house drain—disconnected from the sewer by a syphon and with the fresh air inlet carried up to the top of the house—is practically at a standstill."

With the air inlet at the front of the house and the outlet at the back, there would be pressure of the wind to send a current to the point of least resistance. Then, the sun shining on one of the pipes and not on the other, or one pipe inside of the house and the other outside, all cause differences which produce currents of air through the pipes, and we do not need these currents to be great or very quick.

If Mr. van Putten expects me, as a plumber, to sacrifice my house-drains and soil-pipes, &c., for the benefit of his sewers he is quite mistaken. If he, as a civil engineer, cannot ventilate his sewers satisfactorily, independent of the house-drains, then I fear he is behind the age. Various plans of doing so have been enunciated, and are in practice.

I see one "C. E." has just patented one of the high-level styles similar to what is advocated by me in the "Transactions" of the Sanitary Institute of Great Britain for 1883. I fear he is rather late to claim this as a new idea in 1890.—I am, &c.,

W. P. BUCHAN.

Glasgow, October 4, 1890.

SIR,—In the *Builder* of the 27th ult., your correspondent, Mr. Buchan, in criticising a former communication of mine to your journal, says that any notion that two yards additional length of pipe to a side fresh air inlet of a disconnecting trap would give a greater volume of sewage air to eject on to the street shows that I do not understand the subject of house drainage.

I admit that I have not the large experience and scientific knowledge of your able correspondent, still I take credit for having as much common sense as to see that he is wrong in some of his assertions. However, when he says that there is nothing in these two yards of pipe to raise a smell, I quite agree with him, for the smell comes either from the contents of the closet that is being discharged, or from the deposit in the intercepting trap, or it may be partly from both.

Again, he says that fifty-five minutes out of every sixty fresh air is passing into the drain, and that though this should be stopped for a few seconds by the discharge of a closet, &c., the fresh air that has been entering has to be first pushed out at the grating before any badly-smelling air can get out, and by the time the badly-smelling air can get the length of the grating the closet has ceased running, whereupon the bad air turns back in the drain and goes up the soil-pipe, and out above the roof. That to a great extent concedes the point I have been

contending for—viz., that the air in the pipes is ejected on to the street, and that the grating, which ought not to be; but that the badly-smelling air, when it gets down to the trap, should turn back and go up the soil-pipe and out above the roof is a novel idea. Suppose a closet or bath is discharged at the top flat of a four-storey tenement, where there are eight tenants. This discharge acts like a plug, or piston, driving before it the greater part of the air in the pipe between the point of discharge and the trap, while at the same time, above the roof, there is a rush of fresh air into the soil-pipe following close on to the discharge, and by the time it reaches the trap it has acquired such a velocity that, instead of merely glancing into the trap and turning back and going out at the roof, as stated by Mr. Buchan, the impetus it has acquired in its descent continues for a little after the discharge has reached the trap. The result is that it moves on towards the fresh-air inlet and on to the street. But admitting Mr. Buchan's view of the matter to be correct, that the foul air has turned back and is ascending the pipe, what other closet in the top flat is being discharged, in that case the foul air from the previous discharge must be ejected on to the street.

X. Y.

#### FONTS.

SIR,—I have lately been staying at Penmaenmawr, in North Wales, and while there I was struck with the unusual character of the font at St. Seiriol's Church. It is a modern one, about twenty years old. The bowl is large and prettily ornamented with a bold carving of water-lilies, but the peculiarity consists of a small column standing on the west side of it, which supports a stone reading-desk which rests on the edge of the basin of the font.

Fonts having such appendages are not often seen, and as I have been for some years collecting instances of them it may interest your readers to hear of some. The only other modern one with which I am acquainted is at Wroxall, Somersetshire. This has a stone book-rest attached to the pillar against which the font is placed. It is, I believe, about sixty years old.

At Beckley Church, Oxfordshire, is a massive plain tub-shaped font, and close beside it is a small column of Perpendicular work supporting a stone desk. This is figured in the "Guide to the Architectural Antiquities in the Neighbourhood of Oxford." At Pitsford, Northamptonshire, is a fourteenth-century font of octagonal shape, and to one of the eight sides is attached a species of bracket perforated with four holes. The use of this has not been satisfactorily ascertained, but it was possibly the support of a book desk.

At Heyford, Northamptonshire, is a font, the plain, round basin of which is colite, resting on a stem of red sand-stone, and attached to this stem where it joins the basin is a stone bracket, for what purpose is not apparent. At Fاختon, in Northamptonshire, is a font with a plain circular basin, and in the exterior of this basin a rudely cut recess has been made, 4½ in. high, 5½ in. wide, and 2½ in. recess. This was probably to hold some of the things enjoined in early baptismal ceremonies—such as the holy oil or salt. A circular font at Rainham, Essex, has a small bracket attached to its upper edge.

A font at St. Martin's, Essex, has a pedestal-like receptacle attached to it just below the moulding, where the octagonal basin joins the pillar which supports it. A fourteenth-century font at Odiham, Hants, has a curious projection on one side. This has, however, not been added to the font, but has been cut out of the same piece of stone as the font. It has been hollowed out into a sort of trough, 5½ in. in length, 2½ in. in width, and 1½ in. in depth, and at each end of this trough is a hole pierced. The font is further interesting by having the text, "Auxiliū meū a dñō qui fecit celum et trā," in raised characters, about 6 in. high, round the bowl. This text is preceded by a pretty lily-like flower.

A font at Yoolgrave, Derbyshire, of circular form has a small basin-like appendage attached to one of its sides, a winged dragon lying with twisted tail on its back is carved on the bowl of the font, and apparently holds the smaller basin in its mouth.

At Princes Town, Jersey, is an old font now lying disused in a public tea-garden. This font has a small basin fastened to the inside edge of the larger bowl.

At Nun Monkton, Yorkshire, is a round font standing on an octagonal stem and step, and in one of the angles of this step is sunk a rounded hollow, 7½ in. in diameter and 3 in. deep.

A wooden font found in a bog at Dinas Mawddwy, Merionethshire, has a large round basin hollowed in it, and by the side of this a second much smaller basin has been cut out. A font of stone with a similar arrangement of a large and small basin, side by side, is at Cossennil, near Grenoble.

Several fonts on the Continent have appendages attached to their sides resembling a smaller font standing beside the larger one. The small one is used as a piscina to receive the surplus water which falls from the head of the baptistery into the font. A font of stone into the font and be mixed with the consecrated water. Of these, I may mention fonts at Quimper, Guingamp, St. Pol de Leon, Clisson, Chréens, St. Nicolas de Macherin,

Blèves Villers, Canvoct (Falaise), and Roches-Mabile.

Two Swedish fonts,—those of Bjälland and Säfve,—have an arrangement very similar to the one at Nun Monkton, in Yorkshire, having small round receptacles sunk in the lowest step.

EMMA SWANN.

Wallon Manor, Oxford, October 4, 1890.

#### ILLUSTRATIONS OF THE "VICAR OF WAKEFIELD."

SIR,—With regard to what you describe (p. 262, ante) as "an extraordinary oversight" in my paper on "The Vicar of Wakefield and its Illustrations," permit me to refer you to the statement (in the first paragraph) that it gives an account of the story "exclusively in its aspect as an illustrated book." If I mention Stothard's drawing, it is because it is, exactly like the other drawings he prepared for the engravers of his designs for books; if I mention Mulready's pictures, it is because they were elaborated from his book illustrations. I am perfectly aware that, besides those you name, many artists, e.g., Ward, Madliss, Woodward, have sought in the "Vicar" the subjects for paintings, but to have enumerated these works would have been beside my purpose. AUSTIN DOBSON. Ealing, W., October 6, 1890.

#### The Student's Column.

##### HOT-WATER SUPPLY.—XV.

IN reference to the conversion of a tank to a cylinder system, treated of in our last, it remains to be added that whenever a conversion is effected, and it is found that a draw-off service is connected to the flow pipe below the cylinder, this service must be cut off and reconnected to the rising main above the cylinder, as it will now be understood that the chief advantage, the safety, of this system is effected by omitting all means of emptying the cylinder, except by the special cock with loose key that is provided for workmen's use and emergency. If, in the conversion last explained, anything would be gained by leaving the original return pipe untouched, this may be done, as no particular benefit will be effected by cutting this pipe and connecting the two ends into the cylinder; it can be left as it existed before, running from the tank to the boiler, the cylinder being inserted into the flow pipe only.

##### TWIN BOILERS AND SERVICES.

There are at this moment hundreds, if not thousands, of houses, particularly in the West end of London, that have the old-fashioned open ranges in their kitchens, these ranges having two boilers fitted in them. These are not exactly "twin" boilers, but they will serve to illustrate the use and occasional necessity of these articles.

The object of having two boilers in these old ranges was twofold; firstly, one boiler was considered and generally found to be incapable of providing sufficient hot water for the whole house, and it became necessary to put in two boilers with a proportionate increase in the size (width) of the fire, so that one could be used and kept distinct for kitchen supply, and the other for baths and the other taps in the house. This arrangement was so customary that makers of modern ranges are continually being asked if they are sure the one boiler in their ranges is sufficient for all purposes, and the enquirer is often incredulous if answered in the affirmative, as the boiler in a modern range may only be half the size of one of the boilers in their existing range.

The only argument in favour of the two boilers in the open range was that the demand for hot-water in the servants' offices need not exhaust the bath supply, or *vice versa*, but this argument cannot hold good with a modern range, provided it has a good boiler. The arrangement of two boilers, however, became so customary that great numbers of houses will be found to have a cistern at the top and another below, one for upstairs use, and one for kitchen supply (for both hot and cold water, but this is now quite unnecessary so far as the hot water is concerned).

Sometimes instead of two boilers a single boiler of large size was used, this boiler supplying the kitchen under low pressure, and with this boiler was fitted a coil of pipes which acted as a heating medium for a hot-water circulation apparatus, that was in connexion with them for bath supply, &c.; this is a wretched arrangement, as, in the first place, hot-water is a po-



medium to heat water with, and secondly, every time a drop of hot-water was drawn in the kitchen the coil was cooled to some extent by the cold water flowing in. The two boilers were other than this, but neither could possibly be recommended now.

An occasion that arises for the use of twin boilers is when the cistern at the top of the house is insufficiently large for all purposes, and the cistern which we must suppose exists down below has of necessity to be relied upon. It will be obvious that the two cisterns cannot anyhow be made to supply one apparatus (if any part of the apparatus extends up above the water cistern), and it becomes necessary to have two boilers in the fire, each doing distinct work with a distinct supply. This, fortunately, rarely happens, as it is an unsatisfactory arrangement, and an effort is always made to overcome the difficulty by adding to the storage capacity of the cistern at the house-top, so that it can meet all demands, and so need only one boiler. It is hardly necessary to mention that the arrangement of two boilers is much the more costly, and as it necessitates an increase in the width of the fire the consumption of fuel is greater, and the range has to be strengthened to withstand the greater wear and tear caused by the greater heat evolved, &c.

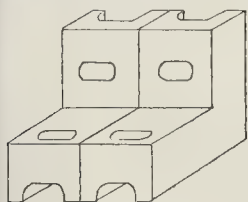


FIG. 32.

FIG. 32 illustrates a pair of boilers to go at the back of a kitchen range, but to get a separate flow to each it becomes necessary to have the width of a most extravagant width, especially if both boilers are not required all day. The difficulty is, therefore, overcome to some extent by

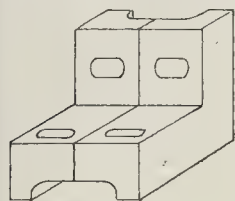


FIG. 33.

making the boilers as fig. 33, but here a disadvantage presents itself in the fact that no means can well be devised to work one boiler independently of the other.

When a pair of boilers are really necessary, it is practically impossible to make them each of an exactly suitable size for the work each has to do. The consequence of this is that in all probability one boiler will overdo its work, and the other fail, and under any circumstances some annoyance will be felt by the boilers working unequally. A very marked instance of this is when one boiler is used for circulation, and one for steam cooking. The circulating boiler must, of course, be capable of good work, and the steam boiler has to be powerful. Yet the latter boiler may be only in use for two or three hours in the morning, and for the rest of the day the increased size of fire is a mere waste of fuel, and the water boiling furiously for no purpose. If it is at all possible to avoid using two boilers in one fire, it is much the best to do so.

Coming within this subject is an arrangement for connecting and using two distinct boilers (say, in two different rooms) attached to one circulating apparatus; this is often resorted to, and is frequently of great convenience, particularly where the demand for hot water varies to any great extent during the day or in different seasons. In some institutions,—col-

leges, for instance,—the quantity of warm water required for early bathing is frequently very large, and complaints then occur of the kitchen-range boiler being quite unequal to meet this excessive demand, although quite able to supply sufficient at other times in the day. The remedy, in this instance, would be to introduce an independent boiler; but on this occasion it would be best to still retain the services of the range boiler, as it will not only aid the other materially, but it will permit of the independent boiler fire being let out when the demand has slackened; or there are cases where a second range of smaller size exists in the kitchen or scullery, and if fitted with a circulating boiler it can be connected on to the apparatus which is worked by the large range, so that whichever is in use (or if both are at work) the supply of hot water does not cease.

The usual way of connecting up the two

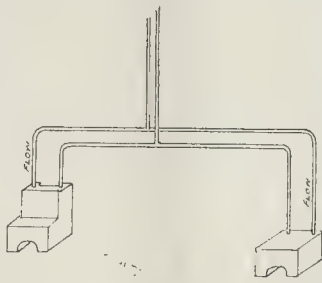


FIG. 34.

boilers is as shown at fig. 34, the flow-pipe from each being joined at the nearest point, and the return pipes in a similar manner; if it is the cylinder system the pipes can be made to enter the cylinder from each side, or they can be joined at the nearest point as just explained.

It is sometimes recommended under this arrangement to have a stop-cock inserted in each flow and return pipe (four in all), so that when one boiler is undergoing any repair or being cleaned, the stop-cocks in that pair of pipes can be closed, and so permit of the other fire being used, and providing the customary hot-water and cooking conveniences. This is certainly very convenient, but the introduction of stop-cocks into the main (primary) flow and return pipes is a most objectionable and sometimes disastrous practice; the least forgetfulness, or any conscious or unconscious trifling with the cocks, may lead to an accident, which is invariably fatal to any one who may be near.\*

Sometimes twin boilers can be avoided by carrying two distinct sets of pipes from one boiler, but it will be clearly understood that these two systems must be fed by one cistern (or two cisterns on the same level), with the expansion pipes both carried to an equal height, otherwise one will, of course, overflow the other the instant they are charged (unless an arrangement of stop-cocks is introduced, which, however, would not permit of the two systems being worked at one and the same time). An arrangement of this kind is of use when one or two small coils are to be heated, say, for an entrance-hall, from the kitchen boiler. It is then best, if it can be possibly managed, to take a flow and return service from the boiler, independent of the ordinary flow and return; this coil service may have stop-cocks, provided none are inserted in the other pair of pipes, and this will permit of shutting off the coils when the tank or cylinder is to be heated up quickly, or when the heat from the coils is not needed. This subject of coils in connexion with kitchen range boilers will be treated fully in a later paper.

There is no objection to carrying more than one rising main (secondary flow) service from the top of the cylinder, if hot water is wanted at a distance in different directions, these various services being either brought back into one return or each having its own return to the cylinder. At one of the Hôtels Métropole just erected there are four 1½ in. secondary flow-

\* It is but a short time ago that a plumber—a practical man—lost his life through omitting to open these stop-cocks when testing a boiler, after having done some work which necessitated their being closed. He was killed instantaneously.

pipes, as water is wanted in great quantity in different parts of the building; the cylinder however is heated by steam, being made of copper and much like a multitubular boiler, but of course an independent boiler would heat it equally well if there was not steam to spare.

### GENERAL BUILDING NEWS.

**THE NEW SPANISH CHURCH, MANCHESTER-SQUARE.**—The new Roman Catholic church which replaces the old chapel of the Spanish Embassy in Spanish-place, Manchester-square, was opened on September 29. The first stone of the building was laid on June 17, 1889. The architects of the new building are Messrs. Goldie, Child, & Goldie. It is a large and massive structure in the Early Gothic style. Externally it is of Portland stone, and internally the whole building is faced with Bath stone. The columns are constructed of Hopton Wood stone and Derbyshire marble. There are double aisles to every part of the building, and the whole is vaulted in stone. The builders are Messrs. Dove Brothers. The length of the church is at present about 160 ft., and the height to the vaulting over 60 ft. The exterior is very unfinished, but it is proposed to lengthen it considerably, to construct a tower and spire upwards of 200 ft. high, and add gabled roofs and turrets to the transepts. A good idea, however, of the fine proportions of the church may be gained by the view from South-street. The internal fittings, altars, &c., are all temporary, and have been removed from the old chapel. We have published the following illustrations of this church in the *Builder*, viz., Exterior Views, August 1, 1885, and June 4, 1887; Interior Views, August 1, 1885, and June 11, 1887.

**NEW CHURCH, ST. ANNE'S, STANLEY.**—On the 27th ult., the new memorial church of St. Anne's, Stanley, Lancashire, was consecrated by the Bishop of the diocese. The building consists of nave, 27 ft. wide, 87 ft. long, in six bays; north and south aisles; baptistery at the west end; chancel, 42 ft. long by 27 ft. wide, with chapel on the south side, and organ-chamber, choir, and clergy vestries, with lavatories, &c., on the north. The principal features of the exterior are the tower over the chapel, the main porch, and the west five-light window. The walls of the church are of stone, that for the exterior being from Woolton and the interior from Runcorn, of variegated colour. The wood-work of roofs and seating is of pitch-pine, the stalls and other furniture being of oak and teak. The roofs are covered with grey Welsh slates, except that of the tower, the covering of which is green Westmorland slate. The flooring of the nave, aisles, &c., is of pitch-pine block paving, laid by Messrs. Roger L. Lowe, & Co., of Farnworth; the flooring of the chancel and sacristy is of marble and glass mosaic. The altar steps are of white marble. The stalls have carved ends, and the screens enclosing them are traceried and carved. The screen on the north side is divided into five bays, and has a central doorway. The screen on the south side has six bays. The reredos is composed of Derbyshire alabaster, with Devonshire marble reliefs. The subject of the carving is the Last Supper, a composition by Mr. Walter Longdale, of London, who was also the designer of the stained glass. The pulpit is of Ancaster stone, with red stone plinth and base, supported by five shafts of Devonshire marble. The font is of Ancaster stone, supported on Devonshire marble shafts. The windows are heated with hot water. The windows generally are glazed with glass in lead quarries. The general contractors for the building are Messrs. Jones & Sons, of Liverpool. The reredos, pulpit, and font, by Messrs. Earp & Hobbs, of London and Manchester; the screen and choir stalls by Mr. Harry Hems, of Exeter; the heating by Messrs. J. R. Cooper & Sons; the mosaic flooring by Mr. George Swift. The stained glass of the east window has been executed by Messrs. Heaton, Butler, & Bayne, of London. Mr. Thomas Hallam acted as clerk of the works. The architects are Messrs. Aldridge & Deacon, of Liverpool.

**NEW MEAT MARKET FOR EDINBURGH.**—On the 2nd inst. the Edinburgh Central Meat Market Company's new premises in Ponton-street were formally opened for business. The market, which is built of brick, with facings of Corncockle stone, measures 80 ft. by 80 ft. The side walls are 18 ft. high. The premises are suitably lighted and ventilated. The total cost of ground and buildings is about £4,600. The contractors were Messrs. James Duncan & Son, and the architect Mr. W. H. Grey, of Edinburgh.

**PROPOSED NEW CHURCH FOR BARRY.**—We are informed that a gentleman holding important local interests has placed £500. in the hands of the Bishop of the diocese towards the erection of a new church at Barry. A grant of £400. has also been voted by the committee of the Bishop of Landaff's Fund, and a site in a good central position has been given by Mrs. Jenner, of Weyroe Castle. Plans for the building are being prepared by Messrs. Kempton & Fowler, architects, Landaff. It is proposed to build, in the first instance, only one portion of the fabric (nave, chancel, and one aisle), estimated to hold 600 persons. The cost of the first portion of the fabric is estimated at from £3,000. to £4,000.



**NEW WESLEYAN CHAPEL FOR HUDDERSFIELD.**—A new Wesleyan Chapel for the Wesleyans of the Gledholt Circuit, Huddersfield, has just been opened. The new chapel has been erected on a site at the corner of Blacker-road and New Hey-road. There is accommodation for 700 seat-holders, 390 on the ground floor and 310 in the gallery. The total cost of the works is about 6,000*l*. The architects were Messrs. John Kirk & Sons, of Huddersfield.

**NEW WING, SIR PATRICK DUN'S HOSPITAL, DUBLIN.**—On the 1st inst., the Clinical Session in this hospital for 1890-91 was begun, and a new wing on the east side of the main building, containing four wards, and intended specially for the reception of fever patients, was opened. The new east wing contains, besides the wards, bedrooms, dining, and sitting-rooms for the nurses, laundry, ironing, drying, and disinfecting-chamber. Each ward is to contain five beds. The architect was Mr. C. R. Owen, the builder being Mr. Collen.

**NEW FORGE AND STEEL WORKS, RENFREW, N.B.**—These new works, situated on the lands of Portfield, have now been completed. The site lies between the Glasgow and South-Western Railway from Paisley to Renfrew, and the River Cart. A railway connection has been made with the main line, and a connexion is being made with a dock in the course of construction at the river. The building is a structure consisting of eight spans, the largest of these being 60 ft. in width, and covering in all over two acres of ground. They are constructed of iron throughout, the roofs being carried by iron pillars and H columns supporting heavy-built steel girders. The roofs, sides, and ends are sheeted with galvanised corrugated iron. The buildings are the work of the Glasgow firm of Arrol Brothers, Germiston Works, from designs furnished by the Chairman and Manager of the Company, Mr. Jas. Miller.

**NEW WESLEYAN CHAPEL, AT CROSBY.**—On the 30th ult., the memorial stones of a new Wesleyan chapel and school in Mersey-road, Crosby, were laid. The chapel is cruciform in plan, with aisle, nave, and transepts, octagonal chancel, and organ-chamber. At the western side of the chancel are placed the minister's vestry, ladies' rooms, and numerous class-rooms, which are connected with the lecture-room. The walls will be faced with Yorkshire shoddy and Stourton stone dressings. The internal part of the walls is of brick, and all the foundations are of concrete. The timber work throughout is of pitch-pine. The work is from the design and was carried out under the supervision of the architect, Mr. J. Francis Doyle, and by brother, Mr. S. W. Doyle, the clerk of works being Mr. Samuel Gunning. The contractor is Mr. S. Webster, of Bootle. The chapel will accommodate about 650 worshippers.

**PROPOSED NEW HOSPITAL FOR TUDMORDEN.**—According to the *Manchester Courier*, it is proposed by Mr. John A. Fielden, of Todmorden, to erect a new hospital for infectious diseases at St. George, Todmorden. The hospital will consist of two blocks of buildings, and will have caretaker's house, offices, ambulance, stabling, and other necessary accommodation. Thirty beds will be provided for the use of the inmates. Plans have been prepared by Mr. John Sutcliffe, architect, of Todmorden.

**BRIGHTON CEMETERY CHAPEL.**—The Brighton Burial Board at their last meeting adopted the report and recommendations of their chairman, Mr. Arthur Leader, architect, to secure the tower of the Parochial Cemetery Chapels and reconstruct part of its stone spire. The Board further decided to employ Mr. J. T. Chappell, builder, of London and Brighton, to proceed with the work forthwith.

**PROPOSED NEW TOWNHALL FOR TUNBRIDGE WELLS.**—Tunbridge Wells, which was incorporated last year, is considering the question of a new Townhall. At the meeting of the Town Council last week, the Watch Committee recommended the purchase of the Camden Hotel and other property contiguous to the present townhall, with frontages to Camden-road, Calverley-road, Calverley-street, and Garden-street,—this site forming a square block surrounded on all four sides by streets,—for the purpose either of adding to the existing townhall or of erecting new buildings at some future date. Some objection was taken to the proposals of the committee, on the ground that the streets surrounding the site were too narrow to accommodate the additional carriage traffic which was likely to be brought into them by the erection of a large town hall, and the consideration of the report was adjourned for a month.

**WILLESDEN CEMETERY.**—The Willesden Burial Board, at an adjourned meeting on the 29th ult., after consulting with Mr. Charles Worley, the author of the successful plan for laying out and building upon the new burial-ground, came to an agreement about the plan, and directed Mr. Worley to proceed at once with the work of preparing the specifications and working drawings.

**NORTH STAFFORDSHIRE TECHNICAL MUSEUM AT HANLEY.**—A very large collection of pottery and glass, with one of ancient Greek pottery, which is being arranged by Mr. Chaffers, as the buildings are to be opened this month. The *Staffordshire Advertiser* of October 4 says that on a detailed examination of the original structure it was found that considerably more than the ordinary decorators' and furnishers' works would be necessary, as the

buildings have been built some time and at a minimum original cost, and having had little care bestowed upon them, had fallen into a lamentable and dangerous state of general dilapidation. The indispensable repairs were in due course sanctioned by the Hanley Corporation. Amongst such works may be named new ceiling lath and beams and plasterwork; new slated roof and skylights, and roof plumbing; removing old external timber, gutters, partitions, and sanitary fittings; new sanitary fittings and drains; new plastering; new entrance vestibule, with plate-glass swing-doors; new low-pressure hot-water heating apparatus, by Haden & Sons, to the museum, laboratory, and entrances, of sufficient power to heat also the present School of Art system of pipes if eventually required; new platform in museum; special summer and winter ventilation to the whole premises, including shafts from the free library; brick buttresses in cement through three stories to stiffen the old structure; new smoke and ventilation stack 70 ft. in height; new beams and pillars, and ceiling and cornices under old upper floor, which was settling; forming open timber roof over laboratory and strengthening same, removing the dangerous parts; decorating and painters' work throughout; reconstructing old stopped smoke-pipes; new locks, new steps at front entrance, repairing yards and pointing with mastic the exterior walls of the building; new boarding on cedar felt to the floors, &c. The Committee have had painted upon the frieze running round the museum, quotations from Sir Joshua Reynolds, Shakespeare, Tennyson, Ruskin, Shelley, Keats, Emerson, Milton, the Bible, Sir Isaac Newton, Herriek, Swift, Cowper, and Wordsworth. These were selected by the Committee from 100 taken from the whole field of English literature, which have been tastefully reprinted (accompanied by illustrative views) as museum cards, and will be on sale at the opening. The museum is a large hall of 80 ft. by 45 ft. and 25 ft. high with north gallery 23 ft. by 20 ft., south gallery, store and committee-rooms, lavatories, &c. The whole of the works have been carried out by the signs and under the superintendence of Messrs. W. Sugden & Son, architects, Leek. Mr. J. H. Bent, of Leek, was the builder, and Messrs. Haden, of Manchester, and Trowbridge, were the engineers. The gifts to the permanent collection include large medallions by Stephen Webb, of Newton, Reynolds, Shakespeare, Milton, and Tennyson, presented by the architects, and cases of silk-producing moths (Leek industry) given by Mr. H. Davenport, Woodroff.

**OLD MIFFORD CHURCH.**—It has been determined that the church at Old Mifford, Wales, shall be enlarged. The preparation of the designs has been entrusted to Messrs. Kempson & Fowler, of Llandaff, and it is hoped that the work may be commenced early next year.

#### SANITARY AND ENGINEERING NEWS.

**SOCIETY OF ENGINEERS.**—At a meeting of the Society of Engineers, held at the Town-hall, Westminster, on the 6th inst., Mr. Henry Adams, President, in the chair, a paper was read by Mr. W. Santo Crisp, M.I.C.E., on sewer ventilation. The author first pointed out that it had been constantly assumed that the movements of sewer-air were almost entirely due to temperature, an assumption which he found did not subsist upon a satisfactory basis. He then referred to the experiments of Miller, Beetz, Miguel, Carnelly, and Haldane, which were made more especially with a view to ascertaining the nature of the movements of sewer-air, relatively to those in the atmosphere. In the result it was found that sewer-air contained fewer; but the author pointed out that their nature might probably differ widely. With regard to the excess of carbonic acid generally found in sewers, the author suggested that it was probably largely due to the mingling of the ground-air with the sewer-air, in cases where sewers were not air-tight. Referring to other gases found in sewers, he pointed out that these gases were in themselves incapable of producing fevers of the zymotic type, and argued that such fevers, when caused by sewer-air, were due to the germs of disease present in the sewer air, and suggested that it was undesirable to set up rapid air currents in the absence of which these germs would fall back into the sewage from which they arose. Dividing sewers into two classes, namely, those into which men could not enter, and the larger ones in which they were frequently employed, he suggested that the smaller ones should simply be provided with vents, carried high overhead, and sufficient in number to provide the house with the fresh air, although a properly drained house should be proof against the most severe test. The large sewers, of course, had to be very fully ventilated, at any rate whilst men were employed in them. The direction of the sewer-air currents varied with that of the wind, being sometimes uphill and as frequently downhill. The amount of movement of the sewer air was also in accordance with the velocity of wind. Having regard to these facts, he suggested that in the ventilation of sewers the fullest advantage should be taken of the wind as a motive power, and that it should be deflected into the sewers, or made to induce out-currents, as may be found desirable.

**CIVIL AND MECHANICAL ENGINEERS' SOCIETY.**—On Friday, the 28th ult., by the kind permission of Mr. A. R. Binnie, Engineer to the London County Council, the President, Mr. Henry Adams, and members of the Civil and Mechanical Engineers' Society, visited the Crossness Outfall Works, and inspected the new storage reservoirs and building, which Mr. Houghton, the resident engineer, said would be completed in nine months.

**THE DRAINAGE OF OXFORD.**—At the monthly meeting of the Birkenhead Town Council, which was held on the 1st inst., the proceedings of the Road and Improvement Committee contained a report by Mr. G. F. Deacon, C.E., on the scheme for the drainage of Epsom and Talbot roads in Oxford; and Alderman Willmer, in moving their adoption, said the Borough Surveyor proposed to lay a brick sewer in this district, but certain ratepayers thought such a sewer too large, and that a pipe sewer would be sufficient for all purposes. Mr. Deacon, however, had confirmed and approved of the plan submitted by the Borough Surveyor. Alderman Inglefield seconded the proposition, and the report was approved.

**PLYMOUTH WATER SUPPLY.**—Mr. S. J. Smith, C.E., Local Government Board Inspector, held an inquiry at the Municipal Buildings, Plymouth, on the 30th ult., respecting the application of the County Council of Plymouth for the sanction to borrow 10,000*l*. for the purposes of water supply. The memorial to the Local Government Board set forth that the Plymouth Water Supply was an open channel, which for a distance of eight miles carried the water supply of the borough on its course to the town, was for a length of five miles or thereabouts of varying widths, was not watertight, and was generally in such a condition that in certain seasons of the year the loss by evaporation and leakage materially diminished the water supply. The Council was desirous of carrying out such works on the least as were necessary to make it watertight, and with that object proposed to face the sides with granite blocks, and to form a concrete bed for the channel in the same manner as other portions of the lead had been treated, and the estimated cost of that and other incidental works was 10,000*l*. Mr. Smith also stated that application had been made to the Local Government Board, and was now pending, for sanction to raise 4,800*l*. to meet the estimated cost of the reconstruction of the Drake's-place reservoirs. No one opposing, the Inspector proposed to visit the lead, when the inquiry terminated.

**POST-OFFICE.**—At the meeting of the Stratford-on-Avon Corporation on the 7th inst., a serious charge was preferred against the Post-office authorities by Alderman Dr. Wason. For twelve or fifteen years the town has been promised a new post-office, and the work, which has increased enormously of late years, has been carried on under exceptionally trying conditions for many years. Two years ago the authorities selected a site for a new post-office, and plans were prepared, but nothing more has been done. In the meantime, the postmaster has died. Alderman Wason, speaking as a medical man, said he would deliberately state that the present small and insanitary building that served as a post-office was answerable for the death of more than one person who had been employed there. Ultimately the Town Clerk was directed to bring the matter, which was declared to be a positive scandal, under the notice of the Postmaster-General.

#### STAINED GLASS AND DECORATION.

**MEMORIAL WINDOW FOR CREICH PARISH CHURCH, N.B.**—In memory of the late Rev. Alex. Lawson, who for sixty years—from 1815 to 1875—officiated as parish minister at Creich, a two-light window has been presented to the church and parish by relatives of the deceased. The window, which has been designed and executed by Mr. Nathaniel Bryson, Edinburgh, is Gothic in character, and measures 12 ft. from sill to apex. In one of the lights there is a figure representing John the Baptist, and in the other St. Paul, while in the tracery is a portrait of the deceased clergyman.

**REBRODS, ST. JOHN'S CHURCH, CANTON.**—The rebrods recently erected in St. John's Church, Canton, to the memory of the late Vicar (Rev. V. Saulez), has just been completed. It is of Gothic design, and constructed of Caen stone, with green and red Irish marble dressings. The three niches are filled with oil-paintings, on a gold ground, containing respectively "The Good Shepherd," St. John, and St. Peter. The work was designed by Messrs. Kempson & Fowler, of Llandaff, the execution of the work being entrusted to Mr. Clarke, also of Llandaff.

**BELGIAN RECOGNITION OF BRITISH VENTILATORS.**—The Council of the Académie Universelle of Science and Arts, Brussels, have awarded a special diploma of honour and medal of the highest class to Messrs. Baird, Thompson, & Co., ventilating, heating, and sanitary engineers, London and Glasgow, for their improved systems of ventilation and sanitary appliances.



FOREIGN AND COLONIAL.

FRANCE.—The committee for inquiring into the project for a maritime canal between Paris and Ouen has been officially constituted, under the presidency of M. Alphand. The Chamber of deputies will have shortly placed before it for consideration a project for the demolition of the fortifications of the town of Omer. The estate of the late Duke of Omer, which has been in the possession of the Duke of Parma and the Duke of Bardi, to whom the Comte de Chambord has left this historic domain and château.—A committee has been formed at Chignon (Indre et Loire) for the erection of a statue of Jeanne d'Arc and the public places of that town.—The Hippodrome at Bordeaux, only recently opened, has been completely destroyed by fire.—At Lyons a hitherto unknown painting of Karl du Jardin has been discovered.—The competition for the construction, at Melun, of a building for storing the departmental archives of the Seine-et-Marne, has just been decided. The first prize has been given to M. Léon, Major of Paris; the second to M. Prosper Buloz, of Melun; the third to M. Léon Beaumont of Paris.—The decision on the competition held at Epinal (Vosges) for a new Lycée, has been decided, with the following results:—First premium, MM. Clauquin and Guérin; second premium, MM. Clauquin and Guérin; third premium, M. Jasson, of Nancy. Honourable mentions were given to MM. Guérin and Berger, of Nancy, and to M. Buloz, of Paris. The building will cost about 60,000 francs.—The excavations near Bourges, in the construction of a bridge over the Auron, allied with the course of the river, have revealed to an interesting archaeological discovery. In the course of the excavations, several statues have been found; and in their rear considerable number of coins, pieces of pottery, hand-mill and several grindstones.—The inauguration of the monument to Flaubert at Rouen, which took place in November, has put off indefinitely to give time to M. Chapu to finish the medallion portrait, with which he is not satisfied.—There is to be inaugurated at Angers, shortly, a monument to the memory of the members of the "Gardes Nationales mobiles" of Dordogne who fell in the Franco-German war.—The works going on for the repair of the cathedral at Cahors have led to the discovery, on removing some coats of whitewash, of some large frescoes in an excellent state of preservation, and with richly decorative details. They are representations of eight prophets. In the centre of the cupola there is also a fresco of St. Stephen, of the thirteenth century. There is also a "restoration" of this fresco. M. Aimé Morot has completed his decorative paintings for the Salon d'Honneur of the Hôtel de ville at Nancy, which will be shortly fixed in their place.—The workmen occupied in digging the foundations for the new Hôtel de Ville at Evreux have come upon a quantity of Roman coins of the third and fourth centuries.—The scaffolding has been removed from the ceiling of the Salle de la Cour au Louvre, and M. Duran's painting of the Triumph of Marie de Medici is now exposed to view. The moulded framework surrounding the painting is now being completed.

ENMARK.—The East Street of Copenhagen, the principal thoroughfare in the Danish capital, has been improved during the summer at a cost of 100,000 kroner. The improvement in Copenhagen is to be the first of a series of improvements in the city. It has now been definitely decided to build an industrial museum in Copenhagen at a cost of about 30,000. It is to contain complete samples of past and present Danish industries. The so-called Prince's Palace in Copenhagen, wherein are held the national Norse and ethnographical collections, is to be re-modelled and greatly enlarged, so that the building is to be isolated, so as to render it safe from external fire. Prof. Storch has been entrusted with the work. The building is one of the most imposing in Copenhagen, and is from last century. The excavation of the site of the Antvorskov Cloister is now taking place, a great portion having been laid bare. The plan of interest by being the only cloister in Denmark in the Romanesque style. It was built in the twelfth century for the Order of St. John by King Waldemar the Great.

RUSSIAN HARBOUR.—The Russian Government is constructing a great new harbour at Treufof, four versts north-east of Libau. At first it was suggested to make the harbour in the latter bay, but this idea was abandoned. The new harbour will cost 13,000,000 roubles, and will be completed in five years. There are to be two tidal locks, with separate entrances, protected by a breakwater.

THE NEW OPERA HOUSE IN STOCKHOLM.—The Minister of Public Works has now under consideration the plans of the new Opera House to be built in Stockholm. Afterwards the local authorities will consider them. An export has been attached to study the interior arrangements in leading theatres abroad, but it seems decided that the process of impregnation of decorations,

curtains, &c., will not be adopted, it having been found in several foreign theatres that the process only protects against fire for a short while, and that, moreover, it is injurious to the atmosphere on the stage.

THE NEW SWEDISH HOUSES OF PARLIAMENT.—A member of the jury for adjudicating upon the plans of the new Swedish Houses of Parliament has caused the designs of Herr Helgo Zetterval, the Government Architect, and which have been accepted in their main features, to be published at his own expense. There are sixteen plates in half the size of the original drawings, handsomely reproduced by the Lithographic Institute of the General Staff in Stockholm. Borings have shown that the site of the new buildings is satisfactory, of which some doubt was entertained.

MISCELLANEOUS.

EXTENSION OF DOVER HARBOUR.—The Dover Harbour Board have just decided upon some very extensive harbour works. It has been decided to apply next session for a Bill to authorise the Board to spend 300,000 upon the extension works, and to raise the money by means of a small passenger tax. It is proposed to enclose a large area of water between the Admiralty Pier and a point to the eastward opposite the Esplanade, where a structure similar to the Admiralty Pier will be run out. The enclosed area will be utilised as deep-water docks, while one portion of it will be devoted to covered water stations, with accommodation for trains on either side of the vessels. It is estimated that the whole work can be completed in three years.

SANITARY ASSOCIATION OF SCOTLAND.—The Board of Examiners in Sanitary Science held an examination in Marischal College, Aberdeen, on the 1st inst., when nine candidates presented themselves. Certificates of competency in Sanitary Science were granted to five candidates, namely:—Mr. James J. Little, Assistant Sanitary Inspector, Pollockshaws; Alex. Knowles, Assistant Sanitary Inspector, Aberdeen, with commendations; James Macintosh, Assistant Sanitary Inspector, Aberdeen; George Horne, Surveyor, Milton of Campsie; David A. Duncan, Water Inspector, Stirling.

HONEYSETT'S PATENT HYDRAULIC CALCULATING RULE.—An instrument, resembling an ordinary slide-rule, has been devised and patented by Mr. Honeysett, by the use of which time and labour may be saved when such calculations in hydraulic engineering as the velocities and discharge of pipes and conduits have to be frequently made. The rule, which is based on Bazin's formula, contains eight scales, four of which correspond to the different nature of the channels under consideration, which may vary between smooth pipes and ordinary river courses. The velocities in feet per second and the quantity discharged for any of these channels, according to the hydraulic mean depth and such inclinations as occur in practice, can be read off the rule with great ease. The instrument is also capable of showing the diameter of a pipe to discharge any given quantity. On the back of the rule, tables will be found for facilitating the calculations of the area and hydraulic mean depth of segments of circular and various oval conduits, for use when ascertaining the discharge of a conduit flowing only partly full. Mr. W. F. Stanley is the maker of the instrument, and great care appears to have been taken in its construction.

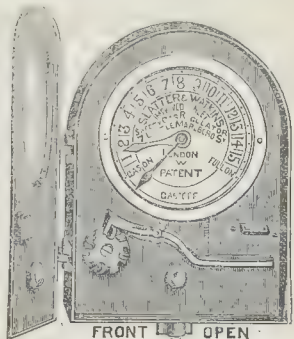
THE ENGLISH IRON TRADE.—The English iron market is still unsettled, owing to the strike in Scotland, and although there are reports of its early collapse, which should be received with due reserve, its present effect tends, to a certain extent, to paralyse trade and to disorganise prices. This has been especially the case in the Glasgow market and the Middlesbrough iron markets. Scotch warrants have vacillated a great deal, while makers in Scotland do not quote at all. The fluctuations in the North of England pig-iron market have not been great, but they show that speculative influences are at work. In the Lancashire and other markets business in pig-iron is almost stopped. A fair inquiry continues in the hematite iron trade of the north-west, with prices tending upwards. The trade doing in finished iron is from moderate to fair, but prices are well maintained, which, under present conditions, could not well be otherwise. The improved tone in the steel market has not been impaired. Ship-builders and engineers continue busy.—Iron.

DOCK EXTENSION AT GLOUCESTER.—The Canal Company have for some time had under consideration proposals for the extension of dock accommodation in Gloucester. The property proposed to be developed lies at the side of the canal just outside Gloucester, and is thirty-seven acres in extent, and by the construction of a dock here much greater facilities will be offered for the discharge of vessels and the storage of cargoes than hitherto. Messrs. Thomas Adams & Son, Limited, timber merchants, of Gloucester and Birmingham, have secured seven acres of land adjoining the proposed new dock, which will give them a frontage of 1,500 ft. to deep water, and enable them to discharge six or seven vessels at one time. In this connection the

probability is mooted of important changes by the Midland Railway Company which, if carried out, would enable the company to do away with its present connexion between the dock system and the main line and its many inconvenient level crossings. —*Birmingham Gazette.*

TECHNICAL EDUCATION FOR PLUMBERS.—The *Newcastle Chronicle* announces that Mr. G. E. Bland, lately of Leeds, has been invited by the committee of the Plumbers' Technical Class Association, acting in conjunction with the Durham College of Science, to assist in the teaching of the technical class held in that college. Mr. Bland will give a short course of lectures during the present term. The Worshipful Company of Plumbers has undertaken to conduct an elementary examination in May next, and to give certificates to junior apprentices. The same company will, in subsequent years, conduct examinations of a more advanced character in accordance with the graded syllabus of instruction drawn up by them, and intended to occupy at least three sessions.

INLET SAFETY GAS REGULATOR.—This is a very useful and simple invention by Messrs. Slater & Watkins, the object of which is to enable the master of a house or of a large establishment to check and regulate the inlet of gas from the main before it enters the meter, and to prevent any one turning on the gas fuller than experience has proved to be necessary for the sufficient illumination of the building. This is done by means



of a stud on the ordinary regulator wheel, which enters a slot on a spur wheel which is called the "stop wheel." The shaded hand on the dial, shown in the cut, marks at what point the supply is to be checked; when the shaded hand is at that point, the gas inlet cannot be turned on further than will bring the black indicator hand level with the "stop" hand. The stop action is worked by the rack wheel on the left below the dial, the dial-hand indicating the result of the movement. The door can of course be kept locked after setting the regulator, so as to prevent its being interfered with. In large houses or places of business this would form a most useful check on the waste of gas.

ARCHAEOLOGICAL DISCOVERIES AT ATHENS.—One of the representatives of the German Government, watching the excavations at Athens, writes to us:—In the quarter north-east of the Acropolis an extensive Roman gymnasium is being excavated on behalf of the Greek Archaeological Society. The site is close to the well-known Tower of the Winds, or the Horologion of Andronikos, and as evidently of the same importance for the leisure and recreation of the Athenian public in Imperial times as is the splendid Stoa of Hadrian in the next street, together with which and the Attalos Stoa, the gymnasium, when entirely excavated, will become a special feature of this part of the town. The excavations show a double row of Roman columns with Ionic capitals, surrounding a large yard, beautifully laid out with well-preserved marble slabs. The underground water-pipes, visible through the round opening of a well, remind them that every new excavation shows how much better the Athens of ancient times was watered than is the city of the present day. Some finds, consisting of tombs with reliefs, have been made in the classic cemetery near the Dipylon.—*Pall Mall Gazette.*

THE PROPOSED BRIDGE ACROSS THE CHANNEL.—A paragraph which has appeared in all the daily papers says that the soundings made by the French engineers on their side of the English Channel, in connexion with the proposed Channel-bridge, have now been completed. The results of the survey are, it is stated, not so satisfactory as was hoped, and the bed of the Channel between Folkestone and the Varne being somewhat unfavourable to the scheme. In this case another route will have to be found, probably between the nearest land points—namely, Cape Grisnez and Dover.

THE BOROUGH SURVEYOR OF DEVONPORT.—The Devonport Town Council has increased the salary of the Borough Surveyor (Mr. J. K. Burnes) from 250*l.* to 300*l.* per annum.



## COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITION.

Nature of Work.	By whom Advertised.	Premium.	Designs to be delivered.
*Plans for New Cemetery .....	Melton Mowbray L.B.	20 and 10 guineas.	Jan. 30/91

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Paving Works .....	Ipswich Bd. of Works	Official	Oct. 14
*Broken Gunners Granite .....	Willesden Local Bd.	O. Claude Robson	do
*Screening Chamber, &c. Sewage Works .....	Stunston Local Bd.	J. B. Peckering	do
*Ironwork at Euston, New Station at Goutray (Cheshire). Enlargement of Station at Llandudno, &c. ....	L. & N. W. R. Co.	Official	Oct. 15
*New Passenger Station, &c. Nelson .....	Lancs. & Yorks. R. Co.	J. R. S. Sturtevant	do
*Bevern, Drains, &c. Farborough Water-works .....	Hatfield Wintery R.S.A.	H. Budden	do
*Making Roof of Corn Exchange Water-tight .....	St. George-in-the-East Vestry	Official	Oct. 15
*Alderden Pithings .....	M. R. Co.	do	do
*New Goods' Office, Liverpool, Reading Room, Child's Hall, &c. ....	St. Paul's Union	Jarvis & Son	do
*Painting Outside of Infirmary, Dulwich .....	Hampton Vestry	H. Jarvis & Son	do
*Paving Attention, &c. R. S. Hospital .....	Met. Asylums Board	Official	do
*Supply of Wood .....	Met. Asylums Board	Official	do
*Road Metal (100 yds) .....	Met. Asylums Board	Official	do
*Warehouse Plymouth .....	Western Counties Agri. Co-op. Assoc. Ltd.	Official	Oct. 18
*Jetty Quay Extension .....	Brit. Harb. Com.	T. R. Salmon	Oct. 20
*College Buildings .....	Walsingham Hall	Buttill, Son, & Bliton	do
*Additions to London University Buildings .....	Com. of H. M. Works	Official	Oct. 21
*Repair of Private Roads .....	Croydon Com. of H. M. Works	do	do

## CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Making a Road, Knowlhill, nr. Bristol New Roads, Sowers, Drains, &c. Dawlish Road School, &c. Eastock, Bournemouth .....	F. J. Padley	Spackman & Son	Oct. 21
*New Railway Lanes, Bridges, Station, &c. Highgate, &c. Co. ....	Highgate, &c. Co.	Edw. Ellis	Oct. 22
*Erection of School, Harlequin .....	Willesden School Bd.	B. Stocks	Oct. 22
*East Guard Station, Walton-on-Near .....	Admiralty	J. M. Brooks	do
*Enlargement of Dining-room, &c. G. F. O. ....	Com. of H. M. Works	Official	Oct. 22
*Main Drainage Extension .....	West Ham Council	Lewis Angell	do
*Completion of Church Tower and Spire .....	Wellington	J. F. Fogarty	Oct. 29
*Telegraph Poles and Crossings .....	G. P. O.	Official	do
*Water Supply to Asylum, Hartwood, Shotts, N.B. ....	Lanark Dist. Council	do	No date
*Dressing and Fencing Kers (800 yds) .....	Newcastle-on-Tyne	T. H. Hutchison	do
*Tramway Paving .....	Mrs. Grimthorpe	J. B. Wilson and G. Morham	do
*Two Houses, New Silkworth, Newcastle-on-Tyne .....	J. Pairs	Official	do
*Lodge at Recreation Ground .....	Bedford Corporation	Official	do
*New Roads, Toppandy, Rhonda Valley .....	J. G. Maddox & Co.	do	do
*Hotel and Houses, Manchester, &c. ....	J. Sawyer	do	do

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be received.
*Assistant Surveyors (2) .....	Edlington Vestry	£200 each	Oct. 18
*Clerk of Works .....	St. Pancras Vestry	£45 weekly	Oct. 18
*Civil Engineer, Manchester, &c. ....	Dawson Town Council	£100	No date
*Sanitary Inspector .....	The Borough Engineer	Not stated	do
	Jewish Bd. of Organs	do	do

Those marked with an Asterisk (\*) are advertised in this Number. Competition, p. iv. Contracts, pp. iv. and vi. Public Appointments, p. xviii.

**WOOD-CARVING.**—A new studio will be opened at King's College on Monday, the 13th inst., under the auspices of the Worshipful Company of Carpenters, for wood-carving classes. Particulars may be had of the Clerk to the Company, Carpenters' Hall.

**ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.**—The tenth examination held under the auspices of this Association was held at 11, Victoria-street, Westminster, on Friday and Saturday, October 3 and 4, when eight candidates entered. The written and graphic examination was taken on the first day, and the viva voce examination occupied the greater part of Saturday. The examiners were Messrs. J. Lobley, M.Inst.C.E. (Past President), Engineering as Applied to Municipal Work; James Lemon, M.Inst.C.E. (Past President), Building Construction; T. De Courcy Meade, A.M.Inst.C.E. (Vice-President), Sanitary Science; and W. Santo Crisp, A.M.Inst.C.E. (Member of Council), Public Health Law.

**PYROGRANITE.**—This is the title of a new material formed by a combination of a fusible with an infusible clay, by which a very hard material can be formed from very common clays, which can moreover be mixed in such a manner as to take (after polish) the appearance of various marbles. This mere imitation of another material will of course have nothing to recommend it with most architects; we may only observe that those who do want imitation marbles may probably find pyrogranite harder and more lasting than scagliola; but the polished self-coloured specimens, which do not imitate anything but merely present a polished surface of various colours, will form a very good substitute, both as to appearance and sanitary fitness, for marble and other more expensive substances for dados and wall-lining. Comparing the pyrogranite with glazed brick, it has the advantage that it can be used in such thin slabs as to take the place of slate for roofs. We saw some pieces as thin as slate; we doubt if they have in this thickness the tenacity and durability of slate; but the material can, we think, be used as roofing-tiles in lesser thicknesses and consequently with less weight, than most roofing-tiles in the market. The manufacture is the invention of a Russian, a practical brickmaker, who has experimented for many years in the mixing of blue red and grey marls with various fire-clays. The patent rights have been already purchased in the United States as well as in England; and Mr. Freeman proposes to offer a limited number of licences to manufacturers to work the process. We made a very careful examination of a number of specimens, and without undertaking to promise for it all that is claimed by those directly interested in it, we can state that the material is worth attention; and it ought not to be a costly one, since the patentee states that he can produce it, by the working up of this special process, from inferior beds of clay which would otherwise be little better than waste stuff.

**THE ASSOCIATION OF PUBLIC SANITARY INSPECTORS.**—The annual meeting of the Association of Sanitary Inspectors of Great Britain was held on Saturday evening in Carpenters' Hall, London-wall, Mr. Hugh Alexander, Chairman of Council, presiding. In the annual report a warm tribute was

paid to the memory of the late Sir Edwin Chadwick, ex-President of the Association, and reference was made to the block of business during the late Parliamentary session, extending measures of sanitary reform recognised as necessary to make sanitary inspection more beneficial to the public health. The report also called attention to the necessity for a statutory definition of the qualifications for sanitary inspectors, tenure of office, duties, and salaries, declaring that the conditions under which at present sanitary inspectors discharge their duties were inimical to the interests of public health. The report was adopted. Mr. Alexander was re-elected Chairman of the Council, and Sir Spencer Wells, M.D., and Captain James, Chairman of the Sanitary Committee of the London County Council, were elected hon. members.

## LEGAL.

## THE DANGERS OF SKY-SIGNS.

On the 3rd inst. at the Clerkenwell Police Court, the Bovril Company (Limited) were summoned by Mr. C. Mealy, surveyor to St. Luke's Vestry, for that at 63, Bath-street, St. Luke's, they did unlawfully erect a sign projecting over the public way of Lever-street, St. Luke's, and that they did not within fourteen days after notice to them remove so much of the sign as projected over the public way of Lever-street, contrary to the 18 and 19 Vic. cap. 120, section 119.—Mr. Bodkin, barrister, appeared on behalf of the St. Luke's Vestry to prosecute, whilst Mr. Forrest Fulton, M.P., appeared on behalf of the defence.—Mr. Bodkin stated that the Bovril Company had erected a very large sky-sign on the top of their warehouses, and the letter B overhanging the pavement. The letter, which was of wood, weighed about 1 cwt., and was something like 152 ft. above the level of the street. The St. Luke's Vestry objected to the sign, and they ordered notice, in accordance with the powers given them under this particular section, to remove that portion of the sign that projected over the footway.—Mr. Forrest Fulton said that the fact of the sign being there was not denied, but it was contended that there was no case under this particular section, for there was no projection from the building, for this particular sign was some 80 ft. above the building. What could have been done was that the Vestry might have proceeded against them for this being a dangerous structure, and then with regard to the fact that it was not a dangerous structure. Mr. C. Mealy said that the letter B of the sky-sign overhanging the footway about 5 ft., and the size of the letter was 8 ft. high and 4 ft. wide. Mr. Frederick George Sage, of the firm of Messrs. Sage & Co., sky-sign manufacturers, stated that they had constructed and erected in the Metropolis and the provinces some 150 of these sky-signs. The letter B of the word "Bovril" was made of wood strapped with iron, and it could away from the wind. There was no grounds for fearing that, through friction, it would fall for at least fifty years or so. The signs were under supervision. There was a lightning conductor to the sign. Other evidence having been given, Mr. Forrest Fulton said the structure was dangerous, and he imposed a fine of 40s. Mr. Fulton said that they would consider whether they would take an appeal with regard to the decision or not.

## A CLAIM FOR PROFESSIONAL FEES.

TYLOR v. NEWSTEAD.

In the Westminster County-court, on the 2nd inst., the case of Tylor v. Newstead came on for

hearing before Judge Bayley. The plaintiff, an architect and surveyor, sought to recover 26s. for fees due to him for work done for the defendant.

The case for the plaintiff was that the defendant was going to erect a building at the French Exhibition for a panorama of Tel-el-Kebir. Mr. Tylor drew plans (which were submitted to the London County Council) of a wooden building, but that the Council refused to pass. Fresh plans of a larger building were eventually agreed to, and the Council passed the plan of the building on the condition that corrugated iron was substituted for wood. A tender was received from Messrs. Chappell, of Pimlico, for 2,600s., the price for erecting the iron building, but by this time the site had been let to some one else.

The defendant said he went to the plaintiff because the latter had erected the buildings for other panoramas including "Niagara" and "Waterloo." The arrangement was that as the matter was all speculation, and he agreed that if the plans were not passed that he should only receive 10s. that he had paid into court. He could not erect the building as the Exhibition opened on May 1st, and the plans were not passed on the 6th of that month.

Plaintiff did not press for the item of 2s. for a second lot of plans, and his Honour gave judgment for 24s., with costs.

## MEETINGS.

TUESDAY, OCTOBER 14.

Sanitary Institute (Lectures for Sanitary Officers).—Professor H. Robinson on "Drainage." 8 p.m.

FRIDAY, OCTOBER 17.

Architectural Association.—Annual General Meeting when an address will be given by the President, Mr. Lemon, at 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—A Lecture will be given on "Sanitary Building Construction." 8 p.m.

## RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

15,140.—DOOR HANDLES: J. Kaye.—By means of this patent the handle is fixed in a frame the shape of the letter D, the straight part being the handle. There is a projection at the back of this frame into which a pull and pull spindle is screwed. In the door plate is a hole or socket near its centre for the projection of the handle frame to slide in, so shaped as to prevent the handle being turned after having been fixed for use.

15,093.—SASH FASTENERS: J. H. Austin.—According to this invention, the object is, first, the automatic locking of the sash when closed; and, secondly, the prevention of the fastening from being undone from outside the sash. Two plates are used, one having a tongue and the other a groove. The tongue and groove are tapered, so that, while there is ample space to insure their engaging with one another when they come together, they draw the two parts of the sash together and prevent their falling. This tongue is kept forward by a spring, and its engaging end is bevelled or chamfered off, so that it is pushed back against the spring, as the sash is closed, and automatically springs forward to engage with the recess in the other plate when the sash is closed. A handle is provided, so that the tongue can be drawn back to free the fastening and open the sash.

15,125.—SPAND OR PEDESTAL AND SIPHON TRAP COMBINED: J. T. Bolding.—A pedestal or stand for a closet-pan, which is the subject of this patent, is made in the form of and acts as a siphon-trap. Being made in one piece, it can be joined direct to the soil or waste-pipe. 9,986.—CHIMNEY TOPS: G. Twedd.—In order to better fix the chimney pots or cowls upon the brick work, a cowl with a flange and sockets which attach to cowl or pots may slip over or into, is made and fits into the brickwork of the chimney at the top.



Sway .....	22,550	Wegman .....	2,659
Porter .....	2,783	F. J. Coxhead, Leyton-	
Holland .....	2,776	stone (accepted) .....	2,659
		[Archeologist's estimate, \$2,500.]	





# The Builder.

VOL. LIX. No. 2499.

SATURDAY, OCT. 18, 1890.

## ILLUSTRATIONS.

All Saints' Church, West Dulwich.—Mr. G. H. Fellowes Prynne, Architect	Double-Page Ink-Photo.
Holy Cross Church, Appleton Thorn, Cheshire.—Mr. Edmund Kirby, Architect	Single-Page Photo-Litho.
The Cloisters, Canterbury Cathedral.—From Drawings by Mr. F. Wilkinson	Single-Page Photo-Litho.
House, "Crooksbury," Farnham.—Mr. Edwin Lutyns, Architect.	Single-Page Photo-Litho.
Borwick Hall, Lancashire.—Drawn by Mr. Edgar Hartley	Single-Page Photo-Litho.
Baths, St. George's-in-the-East.—Mr. Keith D. Young, Architect	Single-Page Ink-Photo.
Additions to Middlesex Hospital.—Mr. Keith D. Young and Mr. Henry Hall, Architects	Single-Page Photo-Litho.

## Blocks in Text.

The Tower Bridge Works: Sketch Showing the Present State of the Middlesex Pier.	Page 306	Old Corner-Posts, Ipswich.—Drawn by Mr. J. S. Corder.	Page 310
Plans of All Saints' Church, West Dulwich	308	The Prior's Door, Ely	311
Plan of Additions to Middlesex Hospital	309	Hot-water Supply: Diagrams Illustrating Paper in the "Student's Column".	313, 314

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### The Architectural Exhibition, Turin.—II.



THE important competition for the new Houses of Parliament at Rome is well represented in the exhibition by a collection of several of the designs submitted. In addition to the designs by Moretti and by Broggi and Sommaruga, illustrated in the *Builder* of September 13 last, several others are worthy of notice. That by Enrico Ristori, which received one of the premiums of 5,000 francs, is shown in a set of drawings of which the elevations are delicately drawn in pencil fixed with a light wash of colour, the windows being marked by a flat tint. The drawings thus look somewhat faint for competition purposes, but the general effect is most refined, and the character of the design accords with the refinement of the drawings. The central feature of the design both in plan and elevation is a large dome of pleasing form, which however does not, as in some of the designs, overpower the remainder of the building, but is well proportioned to the whole mass. The proportions, indeed, throughout this design are excellent, and stamp it as the work of a thoroughly skilful artist. The scheme of the elevations is well conceived, a rusticated order with pilasters on the ground-floor is supported by an astylar rusticated basement, and carries a great Corinthian order which embraces the first-floor and a mezzanine; above is a blank attic with figures in front. The centre and angle pavilions have coupled columns, the remainder of the façade single shafts. The whole design is quiet, dignified, refined, and eminently artistic. The drawings illustrating the design of Signori Enrico Deserti & Co., hanging in close proximity to that just described, are as great a contrast as could well be imagined. Apparently reproductions by the ferro-prussiate, or some similar process, and printed in purplish colour, the drawings are decidedly unattractive. Nor is the design one whit more pleasing; the façades, consisting of a long range of pilasters of a single order, running through two stories, with a commonplace pediment and portico in the centre. A blank attic, with figures at intervals over the pilasters, runs the length of

the façade and at each angle forms the base to a quadriga. A heavily-designed dome of truncated, pointed form, with a square cupola over it, terminated by a horizontal line, forms the crowning unpleasantness to a most unpleasant design.

Next in order comes the design of Broggi and Sommaruga, which is shown in cleverly-shaded Indian-ink drawings, and, in addition to those illustrated in our pages, a large detailed drawing, to a scale of  $\frac{1}{80}$ , shows the ornamentation of the interior of the centre hall. This drawing is strongly coloured, and evidently the handiwork of Sommaruga.

The design by Vittorio Evenes is one of the less satisfactory of those exhibited, and suggests a theatre rather than the home of legislation,—an effect mainly produced by the adoption, for the chief features of the principal façade, of three large arches over triple openings divided by detached columns. The drawings are an example of the method of execution in ink line, bold and rough in draughtsmanship, with paler ink used occasionally to give an idea of difference of plane. Both drawing and design agree together in leading to an impression of something approaching vulgarity of effect. A rusticated basement carries an order which extends wholly round the building, and comprises the ground-floor and mezzanine over. Above this is a second order, containing no visible floor, and whose purpose is merely to contain the great arches already mentioned and a medley of features which enhance the tendency to vulgarity noticeable in the design. The side elevations are somewhat more pleasing, being restricted to the single order and rustic basement. This design is evidence of the difficulty felt by many of the competitors in giving the necessary dignity to a building which in its main features is virtually of one story only. We need scarcely add that in this case the difficulty has not been successfully met. The design by Vittorio Moschini is apparently an attempt,—and that not a happy one,—to outvie the entirely successful design of Baron von Hansen in the Houses of Parliament at Vienna. The author has evidently a sincere admiration for the form of hexastyle peripteral temples, and the design consists of a large collection of these, no less than seven being visible from one point of view, as shown in the perspective, connected by colonnades of the Corinthian order, or by astylar walls with simple rectangular openings for win-

dows, surmounted by a carved frieze of considerable height, the whole standing on an astylar rusticated basement, with simple openings. The elevations are drawn in ink, and tinted in greys more or less greenish in hue, the shading being in cold grey, with the windows partly coloured of similar tint. The detail is coloured to represent marble and granite.

Moretti's design, which we have illustrated, is shown in some well-executed ink-drawings, tinted in cold sepia and grey. The detail drawings are in sepia, with the bronze sculpture in a dark grey tint. The next set of drawings is by Professor Giovanni Ugolini, and, by their proximity to those of Moretti, the difference between the older and younger generations of modern Italian architects is emphatically defined. Professor Ugolini's design we can but characterise as extremely feeble, lacking in sense of proportion and in coherence of idea. The feature of the great arch is once more in evidence, and serves but to suggest a railway station instead of giving the dignity to the design that the author probably intended. The next design we come to, that by Giuseppe Brunetta, is an example of what may be found in most open competitions, the "vaulting ambition that o'erleaps itself and falls on t'other side," the work of one who has yet to learn to walk before he can run in architectural design; the drawings, too, are unfinished, and suggest the "after office hours" style of preparation.

The design by Professor Calderini is cold correct, and commonplace, drawn in pencil and back lined, the windows left white. A great order on a rusticated ground story embraces the first floor and mezzanine; the windows have for their dressing the Roman Renaissance order treatment with pediments triangular and segmental alternately, and the whole design is tame and uninteresting. A nicely-executed set of drawings in ink, shaded in Indian ink and grey, illustrates the design of Signor Giampietri, which was one of those that obtained honourable mention and a premium of 3,000 francs. The chief façade is composed of three well-designed pavilions, connected by colonnades standing on a rusticated basement and extending as wings beyond the outer pavilions. Behind the colonnade are two stories of windows, and above it a blank attic.

Over the central pavilion is a well-proportioned dome, the cupola of which, how-



ever, is a complete sphere supported by a circular colonnade, and apparently resting upon the point of an obtuse conical roof, a feature that is, perhaps, rather a *tour de force* than legitimate design. Besides those we have described there are some three or four others exhibited from this competition out of the forty-nine designs sent in, and, assuming that the drawings in the Exhibition are a fair sample of the whole, as they certainly appear to be, since designs of superior, mediocre, and inferior quality are all impartially shown, we can with confidence express our opinion that the award of the premiums has been just and equitable; the best designs, although by younger men, take the highest place, while the prestige and position of the professors does not enable their inferiority of design to oust their more artistic rivals from the premier positions.

Some few designs submitted in the competition for the Courts of Justice at Rome, as far back as 1886, are hung in the Exhibition, and serve rather to show the advance that is being made in modern architecture. Besides the design by Professor Calderini, noticed in our last issue, that by Camillo Pistrucci, of Rome, may be instanced. This is of very classic character, and has a ground-floor with simple rectangular windows, with architrave around, surmounted by a cornice carried by consoles. This storey is astylar and forms the basement for a colonnade of the Ionic order, enclosing commonplace pedimented windows on the first-floor and a mezzanine over of very feeble design. The central pavilion has the favourite feature of a great arch and under it a projecting tetrastyle Ionic portico. This design, which is of commonplace character, does not convey to us a very exalted idea of the abilities of modern Italian architects, although submitted for the second competition. The design by L. Caselli, of Carrara, also does not rise above the commonplace, suggesting rather a simple wall pierced with holes and decorated with applied orders, each comprising a story and mezzanine.

Another important competition which has been recently decided, the drawings having been sent in on March 31 last, is that for the proposed new Jewish Synagogue at Rome, with college and school adjoining. The plan is in almost all cases identical in its main features, a large central square open space of considerable height, covered with some form of dome; around this on three sides aisles with galleries in two tiers over, and on the fourth side the rostrum, and behind it the tabernacle or Holy of Holies. The galleries are reached by staircases enclosed in turrets at the front angles. The drawings are executed to the scale of  $\frac{1}{16}$  with details to  $\frac{1}{32}$ . The style adopted is almost universally some version of Mohammedan architecture, more or less freely treated. The first premiated design, by Attilio Muggia, of Bologna, well merits its position, and is shown in an excellently-prepared set of drawings, drawn in ink and tinted, the elevations being coloured a light greenish yellow with greenish-grey bands; the interior shown in the sections is tinted in a light greenish-grey, with deep shadows in warm sepia, the sections of walls being blocked in with madder brown. The iron construction is carefully shown, and clever and original in design. The detail drawings show an elaborate scheme of colour-decoration in keeping with the Granada Moorish style adopted. The central dome is well raised, of rather steep pitch, and surmounted by a pointed cupola and lantern. In close proximity to these designs are other drawings by the same architect, for a chalet restaurant in Swiss style, and a design for some flats, the façade of which is indeed very flat, and hardly gives promise of the excellent design for the synagogue. Signor Muggia also exhibits a student design for a theatre, based very palpably on the published illustrations of the Vienna Opera House, both in plan and detail, even to the section of the basement below the auditorium.

A very striking design for the synagogue is

that by Ed. Collamarini and Gustavo Tognetti, of Rome. This at first sight reminds us of an Indian temple; on closer examination the detail is seen to be a combination of Neo-Grec, Byzantine, and Moorish. The central area is larger than in the design just noticed, with narrower aisles around for the galleries, and is surmounted by a cupola of irregular decagonal form, carried on pendentives from the great semi-circular arches, enclosing the central area. The elevations are lightly tinted over a pencil drawing to represent white stone, with bands of blue, and are strongly shaded in sepia. A projecting portico forms the entrance in the centre of the principal façade. The design by Tito Caressa and Professor Francesco Fasi is in a Moorish style, with a Byzantine cupola; the entrance is marked by a group of three arches of moderate dimensions; the drawings are executed in ink, faintly tinted in sepia, and a coloured perspective is also submitted. Dante Viriani has adopted an Arabesque type of design, with horse-shoe arches, a triple arrangement of which forms the entrance under a great arch springing from the staircase turrets at each angle, which are carried up and completed with small domes. The principal dome over the central area is of circular plan and flattish section, lit by windows in the lower part of the shell in a Byzantine manner. The elevations are tinted in warm buff, with bands of deeper tone, and shaded in a purplish tint. The design by A. Lasciare is in a Moorish style, with a very flat dome over the central area, not visible externally. The chief façade has a great arch over a triple arched entrance, and the towers at the side are carried up to a considerable height with small pointed circular domes of Turkish outline. Giuseppe Guastalla, of Turin, also adopts a Moorish style, but the detail is very thin and flat, and, like several others, the design has a great semi-circular arch over the front, surmounted by a straight cornice. The central area is covered by a flat internal dome, not shown externally, and the interior is intended to be elaborately decorated in a Hispano-Moresque manner.

Of Christian ecclesiastical buildings there are several examples in the Exhibition, showing the work of modern Italian architects in this direction. The most usually adopted style is the Romanesque of Northern Italy, but, as a general rule, this particularly difficult style is not treated with satisfactory results, and there is in particular a noticeable lack of coherence in very many of the designs. One of the greatest masters of Italian Medieval work, as far as we can gather from this Exhibition, was the late Conte Edoardo Arborio Mella, whose numerous works show a thorough knowledge of the Lombardic Romanesque period, and an ability in the use of that style for modern building, which appears to be wanting in the designs of many of his successors. The Conte Mella was a voluminous writer on the Medieval ecclesiastical architecture of Northern Italy, and his work entitled "Elementi dell' Architettura Romano-Bizantina detta Lombarda" is a most careful and painstaking account of the architecture of the Lombardic Romanesque period. Conte Mella's work on the Gothic of North Italy is also highly interesting, and in it he takes considerable pains to elucidate the system of triangulation, which he believes was adopted by the Medieval designers in determining the proportions of their buildings. The premiated designs for the façade of S. Petronio, Bologna, submitted in 1887 by Edoardo Collamarini and by Giuseppe Ceri, are very interesting, and either would make a satisfactory frontispiece to the church. The main point of difference between the two is that the design by Collamarini shows flat-pitched roofs, while that of Ceri has high-pointed gables. The interest attaching to these designs is heightened by the exhibition of earlier attempts at the same problem; the original drawings of Maestro Domenico di Jani, date 1512-1514; of Francesco Terribilia, 1572; of Enrico Brunetti Rodati, 1857; and of Giuseppe Modonosi, 1846, being hung in close proximity. The design by

Maestro Domenico has a central gable of ogee form, with pointed gables of moderate pitch, over the side aisles. The wall surface is divided up into parallelograms, and in the centre over the chief doorway is a two-light pointed window, with geometrical tracery, flanked on either side by a square-headed single-light window. The design of Terribilia has a central pointed gable of about 55 deg. pitch, with steeper gables over the side aisles. A similar treatment of the wall surface is adopted, but the central fenestration is changed to a three-light pointed traceried window. Without undue partiality for modern work, we can fairly say that the designs of 1887 are far more satisfactory works of architecture than those of the sixteenth century.

The modern Church of S. Antonio da Padova, erected at Turin in 1883-87 from the designs of Alberto Porta, is illustrated by a well-executed model of the façade, the main feature of which is a great semi-circular arch spanning the width of the nave, with a fresco in the tympanum. The principal doorway stands in the centre of the façade, under the great arch, but entirely lacks connexion with the remainder of the composition. Thus the design, which is in detail based upon the Lombardic Romanesque style, well illustrates the usual failing of the modern Italian church architect, who simply collects details, not always of the most pleasing or refined character, from the work of the past, but fails to weld them successfully into a homogenous design. Another modern church by the same architect—that of S. Pietro in Vincoli, at Bagnolo, Piedmont—similarly illustrates the tendency of modern ecclesiastical architecture in Italy. A design for a church at Castino, by Frizini, showing a very lofty aisle-less nave, and another at Pesinò, by the same architect, a basilican church with aisles, the nave arcade consisting of two bays only, show a lack of proportion which the use of features of abnormal dimensions leads us to believe is a common failing in modern Italy.

Another notable instance of unfortunate proportion is seen in the parish church design by F. Scarpini di Villanova and Rivetti, where the interior, shown by photographs, although scaling some 60 ft. to the crown of the vaulting, looks quite depressingly low—an effect largely due to the size of the bays of the nave, which, in the usual Romanesque manner, is vaulted in square compartments with semi-circular arches, each bay of the nave comprising two of the aisles. The scale of the building internally is still further dwarfed by the large size of the blocks in the alternating bands of light and dark stone employed in the piers and arches. The photographs of the interior show some excellently executed coloured decoration, the work of G. Rollini, which, while thoroughly Byzantine in scheme and general treatment, shows a correctness of figure drawing which it would be mere pedantry to ignore in modern work. Externally, the design is an extremely poor version of Lombardic Romanesque, lacking in cohesion to a supreme degree.

In connexion with the execution of the new façade to the Cathedral at Florence, carried out from the designs of Professor Emilio de Fabris, and completed after his death by Professor del Moro, there are exhibited large size photographs of Professor de Fabris' alternative designs for the façade, showing the difference of effect, according as pointed gables or low-pitched roofs were adopted for the culminating features over the nave and aisles.

In a competition design for a parochial church, exhibited by Camillo Pistrucci, is seen an attempt at a somewhat original plan, consisting of a long nave and chancel with transepts, but without aisles, or rather the aisles are external to the church, and form loggias. The crossing of nave and transepts is covered by a dome, which is circular internally, and is terminated externally by an octagonal lantern. Beyond the crossing is the high altar, also with a dome over it, which, how-



ever, does not show externally, being wholly contained in the roof. Flanking the high altar on plan are transeptal projections, in which the sacristies are located. The choir is eastward of the high altar, the seats being returned in semi-circular form at the extreme east. The church is terminated by an octagonal apse, with chapels of similar form on the diagonal sides. At the west end there is on the north side an octagonal baptistery, with a chapel of corresponding plan to balance it on the south side. Between these are three western entrances, and there are besides no less than five separate and distinct entrances on each side of the church. The style adopted is Italian Romanesque, the prominent features being the octagonal lantern over the crossing, and a tower at the west end, surmounted by a spire resting most uncomfortably on flat pediments terminating the tower walls,—a feature which shows the tendency of modern Italian church architects to follow closely the lines of Mediaeval detail without too carefully considering the nature of the effect produced. Perhaps, however, to an Italian there may be some charm about such a piece of composition, though to Northern eyes the result is most uncomfortable. Apart from this, the tower and spire look too thin for the design of the building, which generally looks long and low, and, mainly from its number of features, lacks repose and dignity, without, however, obtaining picturesqueness.

A somewhat special and interesting example of ecclesiastical work is seen in the design by Giovanni Ferrogio, for the extension and completion of the Hospice di Oropa, a famous pilgrimage church some sixty miles from Turin, which is situated on rising ground, lending itself to a fine architectural and scenic effect. In this case it is proposed to extend the buildings further up the hill, forming an avenue to the new church intended to be erected on the highest point of the hospice. The design for the church is adopted from that prepared by Galletti, but not carried out. This is to be enlarged, however, in the proportion of 4 to 3, by simply modifying the scale of the original drawings. The regulation of the levels and gradients is elaborately shown by contour lines on the plans, which evidence once again the engineering knowledge of the Italian architect.

Competitions for the laying out of cemeteries seem to be as attractive to the Italian competing architect as to the English, and several good designs of elaborate character are exhibited. These usually show a rectangular arrangement of the ground with a cloister round, an imposing entrance, and a chapel at the opposite side. In Moretti's design for the cemetery at Musocco, near Milan, Greek Doric, with somewhat of the French Neo-Grec feeling, is adopted, and shown in an exquisitely-shaded set of drawings. The cemetery at Pavia has been carried out from the designs of Angelo Tavolo, in Italian Romanesque, which style is here somewhat successfully treated.

Some few examples of school planning are exhibited, and show careful attention to the special requirements of educational science. Dual desks are usually adopted, and the rooms are made deep rather than long, the desks being arranged in rows of four or five and ten to twelve rows deep. The windows are then placed down one side, so that left-hand lighting is obtained, a point to which considerable attention is paid. A design for the Communal School at Ampezzo, by G. Falconi, of Udine, is a good example. Here, on the ground-floor, are three class-rooms for 100, 96, and 64 children respectively, the larger numbers being those of the lowest grades. There is no hall for general assembly, but a gymnasium, about 24 ft. by 50 ft., is provided, this being a feature found in the majority of school plans. On the first floor are three more class-rooms and rooms for mistresses, apparently residential.

In the design for a new school in the Via Galiari, Turin, by C. Boito, each class-room has its separate cloak-room, and is lit on both

sides, a wide corridor running along on one side of the class-rooms; all the rooms are carefully arranged to have a south-west aspect, and, in addition to the gymnasium, four rooms for manual work are provided.

In the planning of hospitals, a modern example is the design for a large hospital at Turin, prepared by Dr. G. Spantigati and Engineer A. Perincioli. The hospital is arranged on the pavilion system, but the plan of the pavilions is not all that can be desired. The ward kitchen, lavatory, and bath-room open immediately into the ward, and, being placed against the side walls, absorb some of the space which might with advantage be occupied by windows, of which there are too few, one only being allowed for every two beds. The whole of the pavilions are in one storey and basement under, with fireproof ceiling, and are connected by open galleries, with subway under for tramways from the administration block. Considerations of aspect do not appear to have been strictly regarded, as the wards have every possible variety of aspect, a result partly due to the disposition of the pavilions upon the irregular shaped site. Certain pavilions in proximity to the operating theatre are especially allotted to the clinical school, while separate blocks are provided for ophthalmic, skin, and other special diseases, and for contagious diseases. The scheme also includes an anatomical and pathological school.

In the design for a hospital for contagious diseases at Milan, by Giovanni Giochi, isolated blocks connected by a light, open gallery and subway from the kitchen, are employed, and special care is taken to provide ample ventilation, both by placing a window between each bed, and by forcing in fresh air by a fan from a central ventilator. A well-arranged and fitted steam laundry is placed in a separate block.

As an example of lunatic asylums we have the plans of one at Florence for 600 patients. Here the system adopted has been to divide the patients into different classes and to locate these in separate blocks, rendered to a large degree independent and self contained, no common dining-hall being provided. The divisions of classes made are, Quiet, Infirm and Paralytic, Suicidal, Epileptic, and Chronic and Acute. Comparatively few single rooms are provided, except to the block appropriated to acute patients, which is wholly detached from the remainder of the asylum, and is largely made up of single rooms.

In domestic architecture there are two distinct types of residence which the modern Italian architect is called upon to design; the one, the detached private residence standing in its own grounds, the other, the suite of rooms forming part of an immense block let out in separate flats and usually called a palace, in distinction to the villa. Some of the designs for villas, as represented in photographs from the executed buildings, are among the happiest efforts of modern Italian architectural art. An admirable instance of this is the design of the Villa Maggia, in Sordevolo, Turin, by C. Gilodi. The main house is a rectangular block; on one face is a projecting porch of Ionic columns, not uniformly spaced, on another face is a one-storey circular bay, also ornamented with engaged Ionic columns. The first-floor windows are treated with the conventional order and pediment dressings, and above a richly-carved frieze of amorini and scroll work, embracing circular windows, leads to a bold cornice, the whole forming a charming composition, the effect of which is to no slight extent enhanced by the rapid falling away of the ground and the boldly rusticated part-basement necessitated.

Another pleasing example of the villa is the Villino Romanelli, erected in the Corso Loreto, at Milan, and designed by Romeo Bottelli. This, again, is a square block, with a loggia brought forward on the ground-floor, formed of three arched bays divided by rusticated Doric columns. The central feature of the façade on the first-floor is a two-light arched window opening, surmounted by a segmental pediment carried by two rich

Corinthian columns. The blemish on the design is that at the sides of the central feature are square-headed windows, with a heavy cornice on consoles, which both in size and detail appear quite incongruous with the central part of the design. Signori Musso & Copperi, of Turin, exhibit several designs for villas, one for Copperi himself. Their plans are usually less formal than those just described, and advantage is taken of breaks in the plan to provide niches for galleries and loggie that add largely to the pleasing effect of the designs, which are mainly Italian Renaissance of the Farnesina type. Occasionally what may be called fancy styles are adopted for country houses or seaside residences, as in the designs for the Villa Marsaglia, at San Remo, by Rivetti, which is an attempt at a Moresco treatment, with alternating bands of brick and stone. Other designers have based their work on the chalet of Switzerland and the Italian Alps, these naturally being carried out in wood.

The residences in flats form, of course, by far the larger number of the town buildings of modern Italy, and it would be impossible almost for us to give a detailed account of the numerous examples illustrated in the exhibition. Few plans are shown, but the general idea is to group the various suites around a central courtyard. In each suite the rooms are intercommunicating, but corridors are also in more modern instances provided to facilitate ingress to any particular room without passing through two or three others. In their external treatment uniformity of plans is the predominant characteristic. The various methods in which the openings are decorated differ, of course, largely. Some of the most successful have been those in which the later phases of the Renaissance have been taken as models. The abandon and fertility of invention that characterise the Rococo and Baroque styles appear to be particularly suited to the temperament of the modern Italian designer. One universally adopted means of enlivening the dullness of these façades is the use of balconies, and efforts are made to group balconies and to vary them in design, sometimes even in material, stone and iron. In Turin itself the favourite loggia is extensively used, and assists in giving considerable dignity to some of the otherwise monotonous façades.

Shops are for the most part merely the ground-story of the palazzo devoted to flats, but there are one or two attempts to follow the Magasins du Louvre and au Printemps of Paris, as models for business premises for the Bocconi, the Whiteleys of Italy. These in their mad desire for plate-glass lead to the perpetration of some very unfortunate pieces of design; the establishment at Rome having, for example, no less than three floors to one arched opening filled with plate-glass from top to bottom. Where the shop-front retires behind an arcaded loggia, as in the Milanese example, the opportunity for good design is more favourable. Between the flats and the shops the street architecture of modern Italy tends to become intensely monotonous and uninteresting.

#### THE LABOUR MOVEMENT IN AMERICA.

THE labour movement, as it is commonly but perhaps not very happily termed, will certainly occupy very many pages of the historian who will some day write the history of the last half of the nineteenth century. The very fact that it is in some form or another constantly present to the attention of the most casual of the observers of contemporary events tends considerably to deaden its importance in the mind. But it is not only the labour question in Great Britain which is of importance to the people of this country; commerce is of so international a character that the labour movement in other countries must be watched in order that its effects may be observed on our own labour



market. Hence the work\* the title of which stands at the head of this article is especially welcome at the present time. It will give readers in this country an opportunity of becoming acquainted with the history and characteristics of the movement in America, which has certainly had some marked effects on the same movement in Great Britain. The work itself contains such a large mass of facts that it would be impossible in our space to give anything like a comprehensive sketch of the entire book. There are chapters, for example, on "Early American Communism," on the "Economic Value of Labour Organisations," on the "Socialistic Labour Party," and so on, all of which are full of interest to any one who has given the least thought to this most momentous question. But we shall restrict ourselves to the chapter on "The Growth and Present Condition of Labour Organisations in America," since it is the one which best indicates the characteristics and the progress of the labour movement beyond the Atlantic.

The beginnings of trades unionism are visible in a crude form in the very first years of the century, and the modern machinery of strikes is visible also at the same time. There is evidence of this in the year 1802. "The sailors in New York received 10 dollars a month, but wished an increase of 4 dollars, and endeavoured to enforce their demands by quitting work." They marched about the city with a band, and compelled other seamen employed at the old wages to leave their ships, but "the constables arrested the leader, lodged him in gaol, and so ended the earliest of labour strikes." We mention this incident because there is a popular impression that strikes are features of very recent growth; on the contrary, a rule of the constitution of a body called "The General Trades Unions of the City of New York," which was in existence in the year 1833, states that "no trade or art shall strike for higher wages than they at present receive without the sanction of the Convention." Thus it is obvious that in the Eastern States of the Union strikes were a well-recognised means of obtaining higher wages at the end of the first quarter of the present century. But the power to strike implies more or less of cohesion and combination among working men, and therefore it is equally clear that by this time the system of trades unions was already in existence. In the earlier years of the growth of unionism the chief centres of the movement were Boston and New York. The General Trades Union which we have just mentioned was a New York union, and was a combination of subordinate unions of the various trades and arts in New York city and in its vicinity, and in Dr. Ely's opinion "is the earliest example in the United States of those central labour unions which attempt to unite all the working men in one locality in one body, and which have now become so common among us." Again, a pamphlet is quoted by the author containing an address before a working men's society in Massachusetts in 1831 in which the speaker congratulates his audience on the working men's associations as being, though comparatively new, yet growing in number and importance. We must, however, wait for a good many years before we can find trades unions in great numbers. They are essentially the results of large populations, of keen competition, and of an aggregate of capital. These conditions, it goes without saying, are far more characteristic of the later years of the United States, and therefore it is not a matter of surprise that trades unionism has shown a marvellous growth in the last thirty years. Thus we find it is the year 1865 when the Bricklayers' and Masons' International Union of America was formed. The establishing of such a union as this shows at once the comparative paucity of labour organisations in the earlier years of the century, and indicates with clearness the historical period of their development. In the year

\* "The Labour Movement in America." By Richard T. Ely. London: William Heinemann, 1890.

1869 the society, now one of the most powerful and remarkable labour organisations in the world, "The Knights of Labour," was formed. The founder was one Uriah S. Stevens, a tailor of Philadelphia, who called together eight friends, who were the nucleus of a body now numbering many thousand members.

Having reached the formation of this society, it would be useless to enumerate others which have since been formed. It is of greater interest to turn to the constitution of these bodies. The original unions were chiefly, in fact, entirely, for the purpose of organising the workmen in separate trades, to obtain better wages and shorter hours. These, of course, have still been continued, but there has followed on the union of individuals a union of unions. Thus the Journeymen Bricklayers' Protective Association of Philadelphia was formed in 1880, and now contains two thousand members. The resolution at the end of the preamble states that this body is established "to maintain a fair rate of wages, encourage members to advance themselves in their trade, to fraternise in a spirit of harmony, and use every means which may tend to the elevation of bricklayers in the social scale of life." Here we have a purely selfish trade organisation, that is to say, one which is concerned only with the interests of a particular trade. But there have also sprung into existence such combinations as the Federation of Organised Trades and Labour Unions, which "aims to promote the common interest of all trades unions and labour organisations, and to watch the course of legislation in order to promote that which is considered beneficial and to express that which is regarded as injurious." But central labour unions such as the "General Trades Union of the City of Cincinnati" now exist all over the United States, and at the present time we find unions of individuals, and what we have called unions of unions, so that labour across the Atlantic is thoroughly organised from top to bottom. In this country the size and vastness of the organisation is not easy of realisation, because we can scarcely properly picture the numerous and great cities spread throughout the equally great territory of the Union. It places labour in a most powerful position, since it enables it to be in a comparatively stronger position than organised capital which, in a much smaller country like England, is capable of much greater combination, and is thus *pro tanto* more powerful than in the United States. For this reason the frequent success of labour over capital in the United States, when contests have arisen between them, does not necessarily forbode the same amount of success in this country.

But there have also come into existence associations of workmen which, in principle, are antagonistic to the older union. Of these, that to which we have already alluded,—the Knights of Labour,—appears to be the most powerful. These associations are antagonistic, in a sense, to the more restricted trades unions, because they are formed to benefit the working-man generally, without distinction of trade or of capacity, or, it appears, of sex. For the twenty-second article of its constitution states that the object of this Association is "to secure for both sexes equal pay for equal work," by which, we presume, is meant a fair day's pay for a fair day's work. But an Association which does not discriminate between trades, or between skilled and unskilled workmen, is one which, though it may, and does, contain members of trades unions in the strict sense, can hardly fail, some day, to come into active opposition with the older form of union, and may even, in spite of its present power and strength, degenerate into an association of quite unskilled labourers. Again, the constitution of the Knights of Labour shows that this body, the numbers of which are sometimes reckoned by millions, has set before itself a much more ambitious programme than does the ordinary union; one of its objects, for example, is "the removal of unjust technicalities, delays, and

discriminations in the administration of justice," and another "that a graduated income-tax be levied." In other words, the object of this Association is to obtain, by legislation from the State, or by compulsion through its powers from employers, anything which will benefit the working class generally, or, to use the vague phraseology of the constitution of the Association, it seeks to enable workers "to share in the gains and honours of advancing civilisation." While most men will smile at the grandiloquent language of this document, it would be foolish to underestimate the strength of this body or its capacity for good or ill. It brings out clearly a remarkable feature of the labour movements of the day, the vague, half-socialistic desires of large bodies of working men, to some extent the results and to some extent the moving forces of modern trades unionism. To consider these in all their bearings would be to embark on the consideration of trade unionism throughout the world. We must content ourselves with having indicated briefly the general character of the growth of trades unionism in the United States, with having noticed its appearance in the first twenty-five years of the century, its growth towards the middle of it, its rapid increases in the last twenty years, together with its three broad phases: the combination of individuals belonging to a particular trade, then the organisation into associations of these simple trades unions, and lastly the creation of societies of workers, without regard to trade, capacity, or sex, somewhat socialistic in tendency, and with the largest and most vague aims.

#### NOTES.

THE current number\* of the "Geological Magazine" contains an interesting article by Mr. J. G. Goodchild, F.G.S., on the "Weathering of Limestones." He commences by referring to a previous article on the same subject, written by him in that magazine in 1875, in which he gave some data upon the rate of weathering of certain limestones, deduced from the observed extent of waste that had affected some tombstones in the churchyard of Kirkby Stephen. The mean of several observations gave as the rate of solution about one inch in five hundred years for stones that were standing erect; the author was unable to find any dated tombstones there lying flat, but is of opinion that disintegration on similar stones in that position would be much accelerated. The estimate above given did not take into account the fact that after being subjected to atmospheric erosion for several years the rate of waste is materially increased by the multiplication of the surfaces presented to the denuding agents. Denudation may take place (1) along the original planes of deposition of the rock, or (2) follow those obscure planes of separation along which the stone will most readily dress, or (3) along planes parallel to the dressed surface. After the lapse of a few years limestone may, and often does, weather by the detachment of flake after flake from its exposed surface. Taking these things into consideration, the author concludes that we may "safely assign to this rock a rate of destruction treble or quadruple that given in the estimate above." From further observations on limestones generally, he says that those which contain an unusual percentage of clayey matter appear to waste at the highest rate, whilst the compact, well-bedded limestones, that include much bituminous matter in their composition, stand at the other extremity. He gives an instance, however, where stone of the latter description, having lain on a disused and very wet road for about twenty-five years, weathered at a considerable rate. On examining several pieces, he states that "it was perfectly evident that since the road had ceased to be used as a cart-road, the surface"

\* Geol. Mag. N.S. Dec. III, vol. VII, Oct. 1890, p. 463, et seq.



waters had etched away the limestone to a depth of at least one-sixth of an inch, leaving the sharp edges of the fossils standing out to that extent in relief, to testify to the quantity of the surrounding matrix that had been dissolved and carried away in the meantime." Another case is given where an exposure to the weather for ten years, in a railway-cutting near Penarth, lowered the general surface of a limestone about one-thirtieth of an inch; whilst a limestone quarried in Millgill, and used hard by in the construction of the railway station at Askrigg, in Wensleydale, was similarly reduced by about one-twentieth of an inch in twelve years, as exhibited by the fossil remains carved in relief. Scrutinising the results arrived at, the methods by which they were obtained, and bearing in mind the large problems which they are intended to partially elucidate, we are at the outset struck by the great want of detailed description of the materials referred to in the article, by which alone we could hope to fully grasp the import of the communication. Reviewing the general scope of the observations, however, we deny that it is possible to get even a slight approximation of the rate of weathering of limestones over long periods from an examination of the effects of a few years only. The author has to a certain extent felt this himself, for, after calculating the rate per inch as indicated by each of the above-mentioned cases (one of which, by the bye, is worked out erroneously), he draws up an average rate of disintegration, and then, in making allowance for accelerated action as the weathering proceeds, he finally states that he believes that "we shall not err greatly in assigning at least double the rate of erosion to limestone generally." To us this appears to be rather a loose method of computation, and conveys the impression that the known rates of weathering as given in the article must be supplemented by a certain amount of guesswork before anything approaching a satisfactory solution of the problem can be hoped for. We hold that the number of observations made as to the rate of weathering of stone, is at present much too limited to enable anyone to judge of the matter; the few additional instances quoted by the author are useful as a further instalment to our knowledge of the subject, and they have a considerable practical bearing in regard to the durability of the particular kinds of stone referred to, and herein consists the chief value of his communication. In other words, the author's scientific facts may be accepted, but not his inferences. It is perfectly possible to arrive at the approximate and comparative rate of waste of a given limestone from observation on old buildings and otherwise, but the general question of the rate of disintegration of limestones as a class must still remain *sub judice*.

**THE** President of the Local Government Board has issued a circular to the various local authorities throughout the country, and also to the County Councils, calling their attention to the Housing of the Working Classes Act, 1890, and the necessity of putting its provisions as to the sanitary state of workmen's dwellings into force. Mr. Ritchie urges on local authorities "a strenuous and judicious exercise" of the powers of this Act, which is not only a Consolidation Act, but contains some new provisions. His object in addressing County Councils, is because these bodies can make use of the powers of the Act in cases of default by the Rural Sanitary Authorities. These circulars are admirable, but they have the fatal weakness of being simply good advice. Mr. Ritchie has no power to enforce the law,—it rests with the local authorities to do this. The consequence is that careless local authorities will simply let the circular lie on the table, and the County Council, of course, cannot do anything until representations have been made to them that the local authorities are in default. Moreover, it remains to be seen whether when such representations have been made to the County Councils they will take up these new duties with energy. The fact

is, it is impossible to unite two antagonistic principles,—viz., local self-government and central governmental control. In this country we have adopted the former principle, and we must take it for better or worse. Circulars such as Mr. Ritchie has just issued are full of good intentions, but are practically worthless.

**THE** London Society for the Extension of University Teaching may count itself fortunate to have secured a course of lectures on Homeric Greece from the well-known scholar, Mr. Walter Leaf. The first lecture was given on Wednesday (October 15), at the Chelsea Town Hall, Sir Charles Newton taking the chair. Mr. Leaf distinctly stated that he approached the subject from its archaeological, not from its literary, side,—his object being to illustrate the Iliad and Odyssey by reconstructing as far as possible the surroundings among which they were produced in the light of recent excavations. Twenty years ago we had simply no material with which to answer the question, has Homer a historic basis or not,—how far is the world he paints merely the realm of a poet's fancy. Now, thanks to Dr. Schliemann's spade and the logic of his co-operator, an answer, definite, if not complete, can be given. In the present lecture, Mr. Leaf dealt with the geography of the catalogue of the ships, and then passed to the excavations at Hisarlik. He wisely wasted no time in detailing the errors into which Dr. Schliemann at first not unnaturally fell, but dwelt on the ground-plan (illustrated by the lantern) of the buildings, palace, citadel walls, and the two successive Propylæas now on all hands acknowledged to be associated with the Homeric Troy. Passing to Ithaca he showed that the topography of the Odyssey, unlike that of the Iliad, though in places clear and accurate, showed no consistent first-hand knowledge of the places dealt with, hence he concluded that the poem was compiled from more than one source,—a conclusion now widely accepted. Sir Charles Newton, in acknowledging a vote of thanks at the conclusion of the lecture, paid the lecturer a high compliment, saying that in his long and varied experience he had never heard the perplexed Homeric question so clearly stated. Subjects to follow are the Heroic fortresses and architecture, Homeric dress and armour, Homeric art.

**THE** problem of the restoration and significance of the "Venus of Milo" will possibly never be solved with certainty, but till it is solved it will not cease to exercise the ingenuity of archaeologists. Mr. Ravaissou, at the recent meetings of the "Académie des Inscriptions" at Paris, has brought forward a theory which is in one respect satisfactory, that it makes the Venus one of a group, and thereby gives a motive to the at present unmeaning pose. Mr. Ravaissou believes not only that the statue was one of a group, but that he can lay his finger on the other statue that actually completed the group. This, he believes, is the well-known "Achilles" of the Louvre, which he holds to be an Ares. The group represented, according to him, the Love-goddess either disarming,—or, at least, quieting,—the War-god by laying her left hand on his shoulder. Mr. Ravaissou exhibited to the meeting casts of the two statues in this juxtaposition. So far, so good; but Mr. Ravaissou goes on to associate the original of the group with Alkamenes and Pheidias, and believes that this type of Venus was the famous "Venus of the Gardens." Here we cannot follow him, and still less when he places the district of the gardens near the Kerameikos, and hence apparently deduces the conclusion that the group was a sepulchral monument representing the heroized dead.

**WE** drew attention at the time of their discovery to the remarkable Vaphio cups, with their realistic representations of the catching and taming of wild bulls. Much has been written and spoken about the

curiosities of their "barbaric" style, but till just now no one has undertaken to give a name to the race who made them. Herr Trendelenburg is, indeed, a bold man. In his paper (reported in a recent issue of the *Berliner Philologische Wochenschrift*, 1890, No. 39) he dares to utter the name *Pelasgian*. As the *Wochenschrift* observes, the Pelasgians have long been under a cloud. To every sound "archæologist" they have been of late inscribed with *noli me tangere*. But the tide is turning in their favour now, and it seems just possible that they may have to become responsible for the art, architecture, and civilisation generally that we group under the name Mycæan. The Cyclopean fortifications of the Acropolis at Athens were attributed by tradition to the Pelasgians; the very counterpart of these fortifications have been discovered at Mycæne and Tiryns. The Pelasgians were a people accounted to pay honour to the dead and the chthonic gods; just such a worship is presupposed by the "bee-hive" tombs at Mycæne, Spata, Orchomenos, and the like. It was the characteristic attainment of the Pelasgians that they tamed oxen to bear the yoke. This is the very work in which they are engaged on the Vaphio cups and on the curious mural painting at Tiryns. Certainly the theory is worth consideration.

**WE** read in the *Daily News* that the Principal and dons of Brasenose College, Oxford, accorded last week a high and ceremonious welcome to the arrival in their midst of the "brazen nose" from Stamford, Lincolnshire. A. à Wood describes this relic as being a face or head of old cast brass, with a ring through the nose thereof, affixed to the gate-wicket of the "Brazen Nose" in that town. Some doubt appears to still remain whether it was carried to Stamford on the secession, for three months in 1834, of students from Brasenose, Oxford; or whether, finding it there, they adopted the sign for their own style and name. At the end of the thirteenth century Stamford University so called,—though never, we take it, a *Universitas* in the common acceptance of the term,—comprised certain colleges and halls. Amongst these were reckoned Robert Luttrell's Semperingham Hall, founded in 1292, for Gilbertine students, and named after the birthplace of the founder of that monastic order; Henry de Hana's Carmelite College; the St. Leonard's Priory, attached to Durham; Peterborough Hall; Black Hall; Vauldrey Hall, for students from the Cistercian Abbey of Vauldrey (*de valle Dei*), near to Grimsthorpe; and Brasenose College.\* Royal authority suppressed Stamford in 1335; the gate of its Brasenose, in St. Paul's-street, has remained to our own day. The King's Hall and College under that name at Oxford was founded in the interval 1509-12 by William Smyth, Bishop of Lincoln, and Sir Richard Sutton, Knt., of Prestbury, Cheshire. They obtained from Oriel and University Colleges, respectively, leases of Salisbury and St. Mary's Entry Hostels, and of Brasenose and Little University Halls. The site also included those of the Staple, Black, Haberdashers, and Little Edmund Halls; together with that, reputedly, of the *brasinium* (brew-house, or brasserie) appertaining to King Alfred's Palace in that city. Polydore Vergil, though did he stand alone we should scarcely take his authority, thus refers to the nose:—

"Per id quoque tempus Gulielmus Smyth, Episcopus Lincolnienis, Margarite exemplo ductus, Oxonii scholasticorum collegium collocavit in aula quam vulgo vocant Brasyn Nose, hoc est osseum nasum, quod eo loco imago area facie admodum immani pro foribus extat."

An inquiry of date 1278, quoted by à Wood, and cited in Ingram's "Memorials of Oxford," mentions Brasen Nose Hall there. The name is also traced farther back, to Henry III.'s reign. A nose, fashioned of metal, over one of the college gates which faces the Radcliffe, has been familiar to several generations since. We have lately illustrated and described Mr. T.

\* For this list we are indebted to a paper, *ad hoc*, read by the Rev. E. G. Wood, at a meeting of the Cambridge Antiquarian Society, on October 29, 1885.



G. Jackson's plans and designs\* for the new quadrangle at Brasenose, between St. Mary's and Lincoln College and All Saints'. For these buildings a clearance was made of some tenements in the adjoining Amsterdam-court, which has perpetuated, in name and site, the memory of the ancient Amsterdam or Broad-gates Hall.

IT may be of interest, not only to those members of the profession who have had their work hung at this year's Munich Art Exhibition, but also to our readers in general, to hear that the Scotch and English work exhibited in the Bavarian capital has been viewed throughout the summer with great interest both by artist and layman, and that very complete criticisms on it have appeared in the local press. These criticisms are, on the whole, very favourable ones; they treat the draughtsmanship with special admiration, and the designs themselves for the most part very fairly. The German critics are, however, somewhat sarcastic as to the want of plans, and express their surprise that members of a practical nation should neglect to send in any kind of plan to explain designs, even in a miniature form. There would have been plenty of room for plans, and it is the custom to hang even large-size plans in a German architectural exhibition, as in a French one. The English architects are the only ones who regard an architectural exhibition as a mere collection of pictures. We have commented on this over and over again, and both French and German critics will take the same view. If our countrymen had paid more attention to this in their *envois* to Munich they would have done themselves more justice.

THE present "tightness" of the Money Market will, it is to be hoped, pass away without causing serious loss to persons engaged in building operations and building transactions generally. But there is no doubt that the present is a time of difficulty, financially speaking, and it is scarcely possible for such a period to pass away without leaving financial trouble in its track. For it is obvious that when city and business men are realising securities at a loss, the market for buildings must be very prejudicially affected, and sales, which in more easy times would be arranged, do not take place. Again, those who have borrowed money on building securities which they have hoped to see turned without undue delay into cash, cannot but be anxious, for banks and lenders of money have now to charge a high rate of interest, and are averse to keeping their money out of reach. But just as the present period is doing good in the City by stopping wild speculation, and breaking up rotten firms, so it does good in the same way in the building world. It checks the current of building speculations, it puts sound business firms on a better footing, and gives them a better chance against men who trade on credit. Such a period, indeed, as the present is certain to recur from time to time, and it is well that it should, for it acts as a kind of financial purge, checking improper business and leaving financial affairs in a sounder state when it has passed away, even though to some it is a period of ruin.

WE have frequently to point to the laxness of sanitary inspectors in rural districts. One reason no doubt is that if they carry out their duties properly, they necessarily make themselves disagreeable to many of their neighbours, and they dread to be considered "unneighbourly." The result is that they often neglect their duties. This hesitation to enforce the law is natural, but that is all the more reason why landowners and persons of influence should, to the utmost of their power, assist the sanitary authorities. From the following paragraph, which we extract from the *Buckinghamshire Advertiser*, it would appear that Lord Chesham does not bear this wholesome principle in mind: "In regard to

the water supply at Londams Cottages, the authority resolved to do the work themselves, and to charge the work to Lord Chesham if it was not at once done." This, from the same report, appears to be the sequel to a number of ineffectual attempts to induce Lord Chesham to remedy a sanitary defect. When landowners in a high social position thus set a sanitary authority at defiance, it largely increases the difficulties, always great, which exist in the way of keeping a community in a proper state of sanitation.

THE case of the Bristol Trams and Carriage Company v. The Mayor and Corporation of Bristol, which is reported in the current number of the Law Reports, is one of much importance to tramway companies. The Bristol Trams Company was a company using the streets of Bristol for the purposes of its business, under the provisions of the Tramways Act, 1870. The Corporation of Bristol decided to lay down road pavement in two of the streets used by the Trams Company; they proposed to do so not only outside the rails of the tramway, but between them. To this alteration the company very naturally objected, as the alteration would have caused much extra expense. Indeed, in many respects such an alteration would appear to be altogether inconsistent with tramway traffic, since there is so much stopping and starting in this kind of traffic. They demanded that the dispute should be referred to the Board of Trade for decision under the thirty-third Section of the Tramways Act, 1870. The Court of Appeal decided, however, that this section did not apply, since the power of the road authority to do the work objected to by the Company, was preserved by Section 60, which provides that nothing in the Act shall take away or affect any power which any road authority may have to widen, alter, divert, or improve any road. This decision is obviously correct, but still it is clear that it is one which may be very detrimental to the interests of Tramway Companies, who have thus no control over the material of which the streets are made.

THE churchyard of St. Mary the Virgin, Aldermanbury, has just been laid out for public resort, and is opened, from 10 to 4, except during the hours of service. The Metropolitan Public Gardens Association have provided some seats, and Mr. Deputy Rogers will present a drinking-fountain. This church, standing within Cripplegate Ward, of which the watchhouse formerly stood at its north-eastern corner, was built in 1677, after Wren's designs, at a cost of 5,237*l.* 8*s.* 6*d.* The tower has raised coigns and a high balustrade like that above the aisle walls. On the tower stands a lofty square turret, of which the upper stage has large railed openings, with a concave roof, and vane. The tower windows, as also those of the aisles, have been filled in with heavy tracery in the Byzantine or Lombardic style. Into a vault on the northern side of the altar the remains of Judge Jeffreys were removed (1692) from the Tower, there to lie by those of his son, Lord Wem. Here, too, are buried Shakespeare's brother actors, Condell and Hemings. A cloister surrounded the graveyard of the earlier church, whereof mention is made by Ralph de Diceto, who was dean of St. Paul's towards the end of the twelfth century. Subsequently, it passed to the hospital or priory of St. Mary the Virgin, founded by William Elsing, by London-wall, and now represented by St. Alphage church. The name of Aldermanbury is commonly attributed to the fact that in this street stood the aldermen's bury or court; and Stow says, "I myself have seen the ruins of the old court hall in Aldermanbury-street, which of late hath been employed as a carpenter's yard." But the late George Godwin reminds us, in his "Churches of London," that at the end of the twelfth century the presentation to this church vested in one Aldermanbir, and that

in 16 Henry III. Gervas alleges that his father Allen had presented one William, who died in 1202. Each of these worthies had for surname "de Aldermanbir"; yet it is possible they were so styled from the locality, and did not, on their own account, give their surname to the church.

THE uppermost floor of the recently-completed west wing of the Edinburgh Science and Art Museum has been utilised for the systematic display of the fine collection of Scottish minerals for which the Museum has been indebted to various donors. These donations are representative not only of the mineralogy but the geology of Scotland, and consist of three sections—(1) A collection of rock specimens; (2) a series of geological maps, sections, &c., published by the Geological Survey under the direction of Professor Geikie; (3) a series of fossils mostly from the Palaeozoic Rocks. The specimens have been arranged, as far as possible, on a chronological basis, so that by a reference to the maps which they illustrate a student may be enabled to trace the tracts where the examples have been found. The collection forms probably the best of its kind ever brought together. To the general visitor the most attractive portion will be the fine specimens of Scottish gold and gems, comprising a series of polished agates, jaspers, cornelians, and serpentine. The portion of the museum where these exhibits are placed is remarkably well lighted, and the building, which is now completed, will, as a whole, bear favourable comparison with any other institution of the kind, whether in Britain or on the Continent.

THE London County Council acted for the best in confirming at their last meeting the order for a new sludge steamer for removing the London sewage out to sea. It is true that this can be only a temporary expedient, and that the cost of it is very great; but as it must be some years before any better scheme for disposing of the sewage can be carried out, even when resolved upon, it is necessary in the meantime that the river should be protected from the serious accumulation of foul mud which must go on increasing at or below the outfalls as long as the sewage is allowed to go into the river.

IN the course of a correspondence which has appeared for the last few weeks in our columns apropos of "A Sanitary Note from Greenock" it has been urged that the syphon trap disconnecting the house drain from the sewer should be discontinued, on the ground that it is a frequent cause of stoppage in drains and is of no sanitary value, inasmuch as, according to our correspondent Mr. E. Van Putten, the sewer, if properly laid and looked after, is less liable to contain offensive and dangerous emanations than the house drain itself. As the subject is of great importance and all the correspondents engaged in the argument seemed to be earnest in their wish to recommend the best sanitary methods, we have given some space to their letters, but we fear that they have not led to anything very conclusive so far. Mr. Van Putten seems to forget that below the syphon there is often a considerable length of house-drain before the sewer with its "continuous flow" is reached, and that therefore by removing the lower syphon he is taking away the means of protecting the house from that portion of the drain, which, on his own theory, is liable to contain offensive matter that has not yet been fairly driven to the sewer by the closet flushing; nor can we accept his theory that the sewer is likely to be less charged with insupportable emanations than the house-drain. In a letter which he has forwarded to us in further reply to Mr. Buchan (but which we do not think it will serve any useful purpose to print as a continuation of a correspondence which has already occupied a good deal of space), he admits that the flow in the sewer varies very much at different times of the day, but urges that it is "con-

\* The Builder, June 4 and August 27, 1887; May 26, June 9, and August 4, 1888; and June 7, 1890.



tinuous" in the sense opposite to "intermittent." That however seems rather a verbal than a real distinction: there are times of the day when the flow is too small to operate as a cleansing influence. He was right in calling attention to the inadequate amount of water often used for water-closet flushing, on which we have already commented, and on which point Mr. Buchan supports him. No doubt with an insufficient flush the syphon affords chances of stoppage which would not exist otherwise; but its advantages more than counterbalance this drawback, which with an ample flush from the closet is reduced to a minimum. With only one syphon under the closet-pan a communication with the sewer is opened, more or less, every time the pan is discharged: some of the air displaced in the pipe by the flush is likely to be driven up past it as well as down before it, especially where there is any upward pressure from the sewer, as often happens in elevated situations. Since it has been discovered that syphons do not do all they were supposed to do in cutting off foul air, there has been a counter-theory set up that they are of no value at all, which is an error on the other side. Nor does it by any means follow that they shut off free ventilation from the sewer and the length of drain immediately connected with it. Ventilation can be taken from immediately below the syphon and carried up to above the roof, if that method is desired. The most important point in the controversy is the long-debated one whether sewers are best and most safely ventilated into the roadways, or by upcast pipes carried up the houses; and this question is still far from being finally settled. We quite agree with Mr. Van Putten in having little faith in extract cowl, which depend on the action of wind, and are therefore useless in a perfectly still condition of the air, which is just when ventilation is most wanted. It would need a more extended series of experiments than have yet been carried out, to determine whether ventilating extracts carried to the tops of the houses are really free from danger of bringing foul air into the upper windows: and a more certain method of insuring the efficient action of such extracts must be found than cowl or reliance on opposition of currents formed by natural causes, the steady operation of which cannot be depended upon. Probably a ventilating upcast at intervals, operated by artificial heat, would be the most certain means of securing regular action; but for a large city this is a very large order to carry out completely. In the meantime our judgment is that the syphon between the soil pipe and the drain is not a thing to be lightly given up, and that greater evils would follow from doing so than any which can be shown to result from its use.

#### THE ANNUAL REPORT OF THE LOCAL GOVERNMENT BOARD.

THE "Nineteenth Annual Report of the Local Government Board, 1889-90," just issued,\* is, as usual, an elaborate account of the complex details of the local administration of the country. It is of additional interest this year as containing some account of the first year's working of the Local Government Act, 1888,—the Act which created the County Councils. Details are given of the various proceedings which were taken for the purpose of bringing that Act into full operation on or before "the appointed day," April 1, 1889, at which date every County Council had to come into office, the date being, however, anticipated by some ten days in the case of London, owing to circumstances which will be in the recollection of our readers.

The "Report" itself, signed by Mr. Ritchie, the President of the Local Government Board, covers 186 pages, which are supplemented by 600 pages of appendices. The first section of the Report deals with the Local Government Act, 1888, and the County Councils. With regard to the financial aspect of this subject, the Report expresses satisfaction that the Im-

perial revenues which were ceded by the Act to the Councils of the Administrative Counties and County Boroughs of England and Wales, in substitution for local grants, had slightly exceeded the estimates which were formed concerning them. Into the details of this statement we need not enter; but before leaving this section of the Report we may quote one paragraph which is worth bearing in mind, viz.:—

"By the Technical Instruction Act, 1889, County Councils have been authorised to make payments out of the County Fund for the purpose of supplying or aiding the supply of technical or manual instruction as defined by the Act, to such extent and on such terms as they think expedient, subject to the conditions imposed by the Act. One of these conditions is that the amount of the rate to be raised in any one year by a County Council for the purposes of the Act shall not exceed one penny in the pound. Money may, however, be borrowed for the purposes of the Act, subject to the provisions of the Local Government Act, 1888. County Councils may appoint Committees consisting either wholly or partly of members of their body to exercise any of their powers under the Act, except the raising of rates or the borrowing of money. Provision is also contained in the Act for a County Council being represented on the governing body of a school or institution receiving aid from them under the Act. The Town Councils of County Boroughs and other Municipal Boroughs have the same powers under the Act as County Councils."

The second section of the Report deals with "Relief of the Poor and the Poor-rate." We learn that on January 1, 1890, the total number of paupers of all classes in England and Wales in receipt of relief was 793,246, of whom 200,263 were indoor and 592,764 outdoor paupers, while 219 received both indoor and outdoor relief. As compared with January 1, 1889, these figures show a decrease of 4,495 indoor and 19,523 outdoor paupers, and an increase of 74 in the number of those receiving both indoor and outdoor relief. The decrease on the total number of paupers was 23,944, or 2.9 per cent. The population of England and Wales, as estimated by the Registrar-General, was 28,628,804 in the middle of the year 1888, and 29,015,613 in the middle of 1889. Taking these figures as the basis of calculation for the purpose of ascertaining the proportion to the population of the paupers relieved on the 1st of January of the two years 1889 and 1890, respectively, it appears, according to the Report, that the total number of paupers amounted approximately in the former year to 1 in every 35 persons, and in the latter year to 1 in every 37 persons. The cost of the relief of the poor, which was 8,440,821*l.* during the year ended at Lady Day, 1888, fell to 8,366,477*l.* during the year ended at Lady Day, 1889:—

"The latter amount represented an average charge of *ss.* 10*d.* per head of the estimated population, being 1*d.* per head less than in the preceding year, and an average rate of *ls.* 1*d.* in the pound on the rateable value of the property liable to contribute to the poor-rate. In thirty-nine out of the forty-six preceding years, the average charge per head of the expenditure on the estimated population has been higher than in 1888-89, and in every previous year for which we have statistics of pauperism, with the exception of the year 1887, the average rate in the pound on the rateable value has also been higher."

These statements, taken in conjunction with others contained in the Reports of the Poor-law General Inspectors, printed among the appendices, are somewhat reassuring. For instance, Mr. R. Hedley, Inspector of the district comprising the Metropolis, refers to the satisfactory state of trade in London, and he points out that the strikes which occurred, though greatly to be regretted, indicated that there was a ready demand for able-bodied labour, and accordingly there had been very little able-bodied pauperism during the year in London. With respect to the arrangements for the relief of the indoor poor of the Metropolis, the Board during the year approved of plans for the reconstruction of the St. Pancras Workhouse; for an extension of the Hackney Workhouse and the St. Saviour's Workhouse at Newington; and for the erection of an auxiliary workhouse, with casual wards, for the Strand Union. Plans were also approved for married couples' quarters at the Fulham-road workhouse of the St. George's Union and the Holborn Union Workhouse at Mitcham, and for certain improvements in the administrative buildings at the Chelsea Workhouse. The Board also approved of plans for the extension of the St. Olave's Union Infirmary at Rotherhithe, and sanctioned certain additions to the lunatic

wards at the Lambeth Infirmary. Plans for many new Poor-Law buildings outside the Metropolis were sanctioned by the Board; they are too numerous for mention here. The totals of expenditure sanctioned during the year for new Poor-Law buildings and the purchase of sites therefor were: For workhouses, 392,652*l.*; Metropolitan District Asylums, 19,028*l.*; District Schools, 27,114*l.*

"Public Health and Local Administration" is dealt with in the third section of the Report, which begins by giving statistics as to the extent to which the borrowing of money by Sanitary Authorities has been sanctioned by the Central Departments which have successively been entrusted with the administration of our sanitary laws. It appears that the total amount of the loans which were sanctioned by the old General Board of Health under the Public Health Act, 1848, up to September 1, 1858, when the Local Government Act, 1858, came into force, was 2,956,178*l.* The sanctions granted by the Secretary of State under the latter Act and the Sewage Utilisation Act, 1865, prior to August 9, 1871, amounted to 7,363,366*l.* Since its constitution on the date before named, August 9, 1871, the present Local Government Board has sanctioned the borrowing by Urban and Rural Sanitary Authorities of sums amounting in the aggregate, up to last year, to no less than 43,938,757*l.* The grand total of these figures, extending over forty-two years, is upwards of 54,000,000*l.* sterling, or upwards of a million and a quarter per annum. This money, as we now know, has not all been profitably spent, for sanitary engineering has been progressive, and mistakes which were committed thirty or forty years ago are not likely to be repeated in the present day. It is interesting to note that of the 43,000,000*l.* odd of loans sanctioned by the Local Government Board during its existence, by far the larger proportion, viz., 37,816,821*l.*, has been borrowed for sanitary purposes in Urban Districts. In respect of sanitary improvements in Rural Districts loans to the amount of 2,914,999*l.* were sanctioned during the same period. Under the Artisans' and Labourers' Dwellings Improvement Act, 1875, loans to the amount of 2,343,353*l.* have been sanctioned, and Joint Sewerage Boards have borrowed 1,155,359*l.*

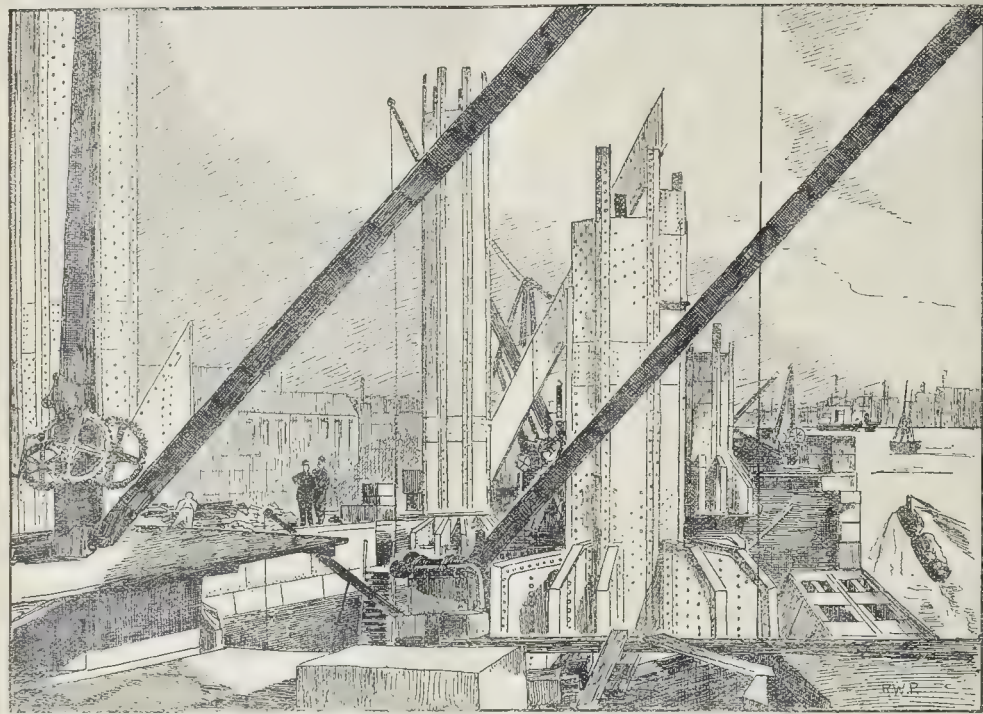
Although the Report says that the number of defaulting Sanitary Authorities under Section 299 of the Public Health Act has perhaps never been so small since the passing of that Act as it was during the past year, the reports of the Engineering and Medical Inspectors of the Board afford melancholy evidence that many Sanitary Authorities are only not in default, technically or officially, simply because they have never been called to account for their shortcomings. It is only when some serious outbreak of illness has occurred that the inhabitants of rural villages and hamlets throw off their supineness and begin to regard the preservation of their health as a matter of more importance than "keeping down the rates." The extracts which we give almost weekly from the reports of Inspectors of the Local Government Board show that much,—very much,—remains to be done for the sanitation of rural districts. Of many a picturesque village whose situation in the midst of delightful country reminds the traveller of the poet's description of "Sweet Auburn," it can no longer be said that there "health" cheers "the labouring swain"; on the contrary, it is too often the lurking-place of typhoid and diphtheria.

It is satisfactory to note that the Board confirmed during the year no fewer than 370 series of by-laws made by Sanitary Authorities under the Public Health Act, 1875, the Public Health (Interments) Act, 1879, and the Acts incorporated with the first-mentioned Act. This number was considerably larger than the number of series of these by-laws confirmed in the previous year. The greatest increase was in the series relating to the regulation of offensive trades.

We can only mention in passing the record of much other useful work contained in the Report, such as the steps taken with regard to the enforcement of the provisions of the Rivers Pollution Prevention Act, 1876, and the Artisans' Dwellings Acts. We are glad to see that the Board is endeavouring to keep Sanitary Authorities up to the mark with regard to their powers in making regulations under the Dairies, Cowsheds, and Milk-shops Order of 1865. Milk is a very facile medium for the conveyance of infectious disease from country to town, and too much vigilance cannot be exercised in re-

\* London: Printed for Her Majesty's Stationery Office by Eyre & Spottiswoode.





The Tower Bridge Works: Sketch Showing the Present State of the Middlesew Pier.

gard to the sanitary conditions of its supply. A safe and harmless precaution on the part of the consumer is to boil it before using it. The administration of the Canal Boats Act and the Sale of Food and Drugs Act form the subject of other interesting paragraphs in the Report. Good work is also, we are glad to find, being done under the Alkali, &c., Works Regulation Act. Mr. A. E. Fletcher, the Board's Chief Inspector under that Act, reports that steady progress is being made in diminishing the amount of noxious vapours discharged into the outer air from chemical factories. The new process for the recovery of sulphur from alkali waste is being largely adopted, and promises to materially diminish the nuisance arising from that waste, while adding to the profits of the manufacturers.

One of the most interesting and important subjects treated of in the Report is that of the London water supply. The reports of the Examiner under the Metropolitan Water Act, 1871 (Major-General A. de C. Scott, R.E.), and of the Analyst (Professor Frankland, F.R.S.) on the water supplied by the eight metropolitan companies in 1889, are given as appendices to the Report. As to the quality of the water, Professor Frankland reports very favourably. According to his analyses, the mean proportion of organic impurity in the water delivered in London by the five companies deriving the chief part of their supply from the Thames was less than in any year since 1868, when the present system of analyses was begun, and was not much more than half the proportion in 1880, since which year the improvement had progressed pretty steadily. The water delivered by the two companies which chiefly depend on the River Lea for their supply was still better. These results, we are told, are due mainly to improvements in filtration, but partly to the fact that 1889 was, on the whole, a fine year in point of weather, there being, to quote Mr. Ritchie's words, "few floods to carry into the rivers the filth from cesspools, farms and ditches, and manured fields." These words alone should be sufficient to warn Londoners as to the possible dangers of their present water-supply. General Scott points out, as regards the river waters, that there is a marked augmentation of impurity, both suspended and in solution, in times of flood, and he calls atten-

tion to the serious fact that the rapid increase of population in the valley of the Thames and Lea tends to increase the difficulties connected with the diversion of sewage and refuse matters from the waters. To quote Mr. Ritchie's summary of General Scott's report:—

"He remarks that in both valleys there are towns, villages, and detached houses the drainage from which reaches the water-courses in an imperfectly purified condition, and that the washings from manure spread over the fields are also apt to find their way into the stream. There is, therefore, necessarily for constant vigilance both in securing the removal of all preventible sources of pollution, and in requiring that the methods of filtration adopted shall be as thorough and effective as possible."

This is all very well as far as it goes, but it does not go very far. Efficient filtration may be depended upon to remove the suspended impurities, but impurities in solution cannot be thus mechanically intercepted, and according to some authorities it is in these impurities in solution that the greatest danger of contagion lies. In view of the growth of the population of London and of the annually increasing amount of water taken out of the Upper Thames and the Lea by the water companies, it is clearly time that this question was grappled with on sanitary grounds, apart altogether from considerations arising out of the exactions made by the companies under cover of a laxly-worded Act of Parliament. The London County Council is now considering the question of acquiring the water companies. If those undertakings be acquired for the public, the price to be paid for them should, in equity to the ratepayers, be fixed with due regard both to the limited volume and the possible dangers of existing sources of supply.

According to General Scott, the average daily discharge of the Thames at Hampton, taking one day with another throughout the year, is 1,100 million gallons, and the dry-weather flow rarely falls below 800 million gallons daily. Now although the quantity of water daily abstracted from the Thames for the use of the metropolis (which is limited to a maximum of 130 million gallons in twenty-four hours) is but a small fraction of the average discharge, the question of real importance is, as General Scott points out, "the relation between the volume of discharge of the river

and that necessarily abstracted, during exceptional droughts in the summer, when the first is at or near its minimum and the second simultaneously approaches to a maximum. This question derives its importance mainly from the fact that the metropolitan water companies collectively cannot impound more than seven days' supply of water at the present summer rate of consumption,\* and practically they must take from the rivers and other sources day by day the quantity required by the population."

It is satisfactory to learn that the constant service supply is becoming every year more general in London.

The fourth and concluding section of the Report deals with "Local Taxation and Valuation." From the masses of figures in this part of the Report we pick out two items of interest. In the year 1888 the gross estimated rental value of property assessed to the poor-rates was 178,589,584*l.* and the rateable value was 149,696,812*l.*,—showing increases over the previous year of 634,709*l.* and 362,188*l.* respectively. The amount of the outstanding loans of Local Authorities at the end of the financial year 1887-8 was no less than 192,222,099*l.*

#### THE TOWER BRIDGE.

We give a sketch this week showing the state of the work now being carried out at the new bridge which is being erected at the cost of the Corporation of London over the Thames at the Tower. Our view, which is taken from the west end of the north pier looking east, shows the large central well in the pier, into which the short arm of the moving leaf descends when the central span is open for the river traffic. The bases of the four steel columns, which will be inside the four corners of the large towers, are now practically completed, and it is anticipated that before the end of the year the steelwork on this pier will be built up to its full height.

The erection of the steelwork on the south pier is proceeding, but it is not so far advanced, however, as that on the north pier. Messrs. William Arrol & Co. are the contractors for the

\* The East London Company is excepted from this statement.



steelwork, and Messrs. Perry & Co. for the masonry.

We gave a general view of the bridge, showing it as it will appear when completed, in our issue of July 3, 1886.

The architectural portion of the bridge was designed by the late Sir Horace Jones, City Architect. Mr. J. Wolfe Barry is the engineer-in-chief; Mr. E. W. Crutwell is the resident engineer; and Mr. J. E. Tuit the engineer for Messrs. Wm. Arrol & Co.

We may mention that the Bridge House Estates Committee of the Corporation of London paid a visit of inspection to the works on the 80th ult., and the temporary platform on which to lay the permanent superstructure of the two spans being now completed on both sides of the river, the Committee were able to traverse the whole distance to the centre abutments.

#### NIAGARA FALLS FOR MOTIVE POWER.

THE oft-proposed scheme for the industrial utilisation of Niagara Falls seems at last likely to become a fact. Of course, a small portion of the mighty body of falling water,—a mere dribble by comparison,—has for long been used as a means of supplying power on the United States side; the tail water of certain mills on the cliffs above the Rapids being a familiar feature in the landscape. The scheme which is at present on the point of being carried out is a very big thing, even in this land of big things. According to our American contemporary, *Engineering News*, work is to be commenced at once by the contractors, Messrs. Rogers & Clement, on behalf of the Cataract Construction Company, the corporation that has been formed to exploit the concession; and the Engineer to the company is now on this side to consult Sir William Thomson, who is interested in the matter. The proposed plan is to take from the Falls 120,000 horse-power, and about 1,400 acres of land have been secured for carrying out the operations. A water tunnel of 6,700 ft. in length, and 490 square feet in section, will have its intake at some point in the Niagara River above the Falls, and will deliver at a spot a short distance below the Falls,—probably near the upper Suspension Bridge. This vast conduit will, therefore, pass under the town of Niagara, and, at a suitable point, a central station will be constructed. The tunnel will be simply a tail-race, and mills or factories requiring power will be situated along its course; it being a part of the scheme to develop a large manufacturing centre in the neighbourhood of the Falls. Poets, painters, and all lovers of the grand works of nature may well be alarmed when they hear the details of this portentous scheme; but there is really less cause for fear than would at first sight appear. Niagara has been for generations handed over to the great army of sightseers, in no country more Philistine than in the United States, so that if a man's impressions are of so delicate a nature as to be marred by a commonplace crowd, Niagara can have no more charm for him now than if there were a thousand factories within reach. Exactly opposite the American fall there is a large hotel, with no more pretension to beauty than is possessed by the average American hotel; right on the brink of the Horse-shoe Fall there is a common-place building; whilst the railway runs just at the back; and the whole place swarms with photographers, flymen, guides, vendors of Brummagem curiosities, and touts of various descriptions. Within the last few years the two Governments have made a laudable endeavour to improve Niagara,—“to make our unparalleled cataract more attractive,” as was said by an enthusiastic citizen of local fame. The land immediately contiguous to the Falls is now public property, whilst an effort has been made to clip and curl the surroundings into a genteel suburban aspect, which is strangely in contrast with the savage “Thunder of Waters.” But nothing can vulgarise Niagara so long as it exists; even a “sky-sign” on its crest would not quite destroy its sublimity. The vital question, therefore, is whether the Cataract Construction Company will falsify its title by using up all the water, and becoming the Cataract Destruction Company. A single fact may set our minds at rest, for the present, in this respect. The company proposes, as we have said, to abstract water equal to 120,000 horse-power. If we allow 2 lb. of coal per horse-power per hour, this would give an equivalent

of 5,760,000 lb. per day of twenty-four hours. That is a great deal of coal; but Sir William Siemens once calculated that if all the coal mined daily in the whole world were utilised for driving machinery to pump back Niagara it would be barely sufficient for the work. We have not the details of Sir William's calculation before us, and doubtless our readers will excuse us looking up statistics in order to form an estimate of what the world's output of coal amounts to. Certainly it is more than 2,571 tons, which is the amount of coal the new company proposes to save, expressed in the larger and more compact unit of weight.

#### THE GATE TOWER, ST. AUGUSTINE'S COLLEGE, CANTERBURY.

AT the recent meeting of the Kent Archaeological Society an interesting report by Dr. Maclean, the Warden of the College, was read, detailing the method of dealing with this valuable but rather dilapidated relic of Edwardian architecture which has been adopted by Mr. Herbert Carpenter in the repair and partial restoration which has been necessary. This report is of interest both in regard to the method of dealing with the work, and also in the additional light it throws on the curiously careless manner in which the practical question of constructive security was often neglected by Mediaeval architects.

In regard to the peculiar design of the angle turrets of the gateway it is observed in the report—

“Usually the turrets of gateway towers, as can be seen in the case of the ‘Cemetery Gateway,’ were continued of the same diameter up to their parapets. But it is probable that this Abbot, or his architect, felt that the turrets of the great Gate tower would not thus be sufficiently important and dignified. By using, therefore, the full projection of the main cornice of the structure, which is continued round the turrets, they were able to increase the diameter, and therefore the height, of these important features, and thus gain the desired effect, although the overhanging and ‘top heavy’ appearance of this upper story is not altogether satisfactory.

At the same time, there is reason to believe that the parapet on the west side of the Gatehouse itself was of necessity raised and adapted to the altered turrets, by the introduction of the rich triangular tracery between them, above which were then re-erected the battlements and rich parapet work of Abbot de Fyndon, adapted by cutting at each end, so as to accommodate the battlements to the wider turrets.

The whole of this parapet and tracery work is very rich and refined in its details, which are of the type peculiar to Kent and Eastern Sussex, while on the central battlements there yet remains the lower part of the figure of St. Augustine, represented as sitting on its moulded coping.

The upper parts of the turrets, though beautiful in design, yet, as examples of good masonry, are full of faults. It is probable that the turrets, as there was some risk in overhauling this lofty superstructure beyond its base, all possible care in bonding the masonry should have been used by the builders, but, on examination, the bonding was found in places to be seriously defective; so much so, that it was evident that while the work was in course of building, the vibration of the wind, and the consequent swaying of the mass, had dislocated the masonry, and opened some of the joints, which, therefore, had been filled in with thin slices of stone. Moreover, it seemed, too, as if at the close of the works some inferior stone had been used, mixed with the other, which is of an exceedingly hard texture. It is probably Aubigny, or from a bed of Caen stone long since worked out.

To this want of care the dilapidation of the turrets was mainly due, and on examination the decay of the stone was found to be very unequal, for while much of the hard stone is almost perfect, very much of the soft stone had perished from 1 in. to nearly 3 in. inwards, while the projecting mouldings had crumbled away, or were but slightly attached to the mass behind.

It will be remembered that the general effect of age on these turrets, and on the upper part of the gateway was due to the dark, and, in some places, black appearance of the stonework, with here and there grey and almost white portions. It was found, however, that this darkened stone was the result of the decay and flaking off of the surface, and the induration of the flakes with modern coal soot crumbling at the least touch into powder, while the grey tone was the original surface of the ancient stones, many of which are as sound as when first erected.

Various portions of the mouldings having thus become separated, fell to the ground, and after some severe gales it was found much damage had been done. The College therefore instructed Mr. R. Herbert Carpenter (of the firm of Messrs. Carpenter & Ingelow) to make a careful inspection from scaffold-

ing erected for the purpose of enabling him to note each stone.

It then became evident that the vibration and swaying forward during heavy gales had become most dangerous, and that the upper stages of the turrets, especially the weaker north-western one, were inclining outwards to a very serious extent. The removal of the ancient timber lead-covered roof had contributed to bring about the settlements, together with the use, in modern times, of the upper part of the turrets as pigeon houses.

Much of the masonry had seriously suffered through neglect, and many of the upper steps which had tied the structure together had perished, and in some instances altogether broken away. The window openings had been originally filled by oak shutters hung to iron staples; but they had been removed for the convenience of the pigeons; in one sense, however, most fortunately, for by thus allowing the wind to pass freely through them, the upper parts of the turrets have been preserved to our time.

On the treatment of the upper portion of the turret, in an architectural sense, Dr. Maclean makes no comment; and indeed in regard to the work of Mediaeval architects it is too much the custom for modern critics to assume that “whatever is, is right”; a reverential attitude which is often carried much too far. Mediaeval architects were after all mortal, and like other mortal men made mistakes at times; and it is not serving the cause of architectural truth to ignore this. To corbel out these turrets when they had reached a little above half their contemplated height, and then continue them with these thicker proportions has a most awkward effect architecturally, and so far from doing away with the thin effect of the lower portion, was just the way to exaggerate it, and to give the whole a clumsy top-heavy appearance. It is quite a different thing from corbelling merely for a cornice and parapet, and it would certainly be condemned as a blunder if done by a modern architect. The defective bonding of this heavy upper length of the turret is a mistake of another kind which has become only too obvious in its results.

As to the means already taken, and the further steps proposed to be taken to render the whole work solid and secure, and at the same time to preserve as far as possible all the record of the former work, the report continues:—

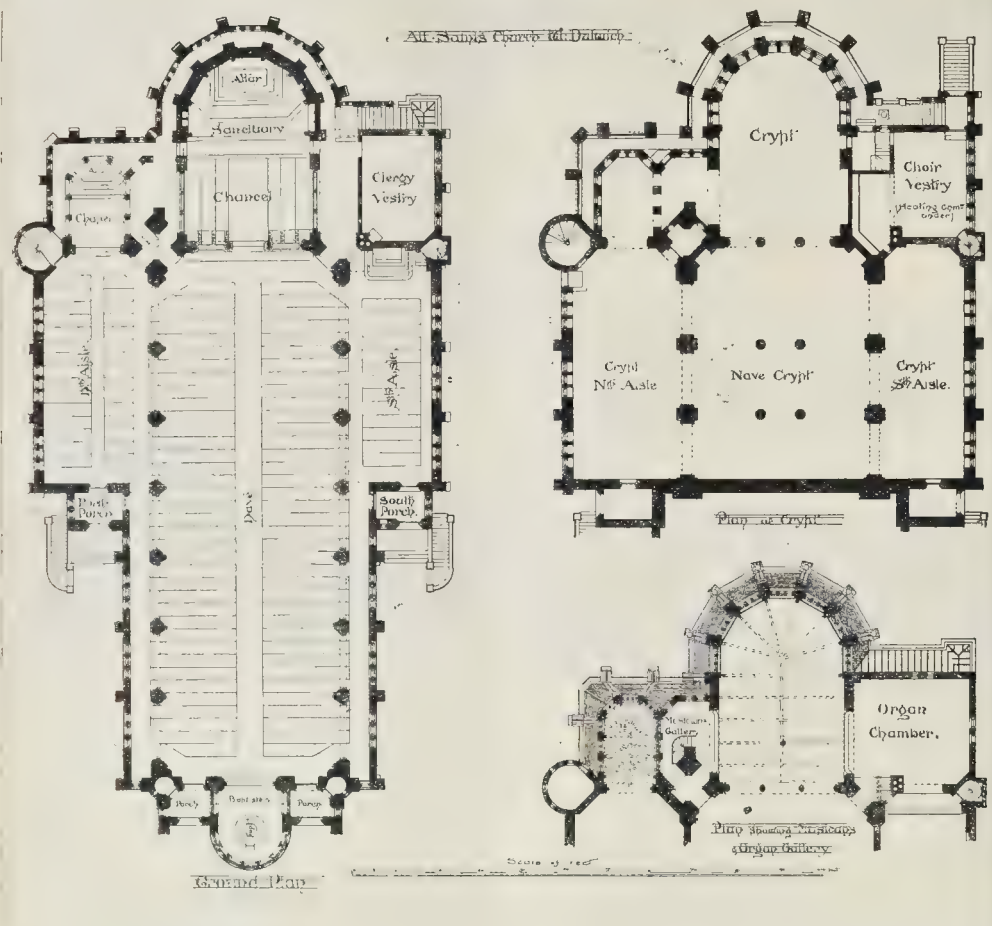
“Mr. Carpenter was of opinion that these defective upper stories of the turrets must be rebuilt from the corbelled-out cornice-line; and this is the work recently brought to completion. It was, however, of the utmost importance to preserve every stone which could wholly, or in part, be reused, exactly in its ancient position. Mr. Carpenter, therefore, by means of many stages of scaffolding, fixed in the ancient putlog holes, was able to make careful measured drawings, showing each stone on each face of the turrets, noting them one by one, and indicating by tints on the drawings (a) those which could be replaced; (b) those which could be repaired or pieced; and (c) those so utterly perished as to require renewal. These drawings have been followed in carrying out the work; and it is proposed to deposit copies of them, both at the College and in the Library of the Society of Antiquaries at Burlington House, as a part of the collection of drawings of ancient buildings before restoration, now being arranged by a committee, of which Mr. Carpenter, F.S.A., is a member.

In the rebuilding it was felt that some better provision than formerly should be made for bonding the whole together, and this most important consideration has been attended to, and is carried out by forming the roof of each turret of a solid slab of Portland stone, built into the surrounding masonry, while a similar slab is built across the hollow circles of the stairs, at the level of the cells of the small openings before alluded to.

It has been a matter for consideration, whether or not these openings should be closed with wooden shutters, as originally intended; but for the present they are left open for the free passage of the wind.

The question as to the best stone to be used was a most important one. It was felt to be injudicious to trust to Caen stone, and it was, moreover, thought that the use of another kind of stone in conjunction with the ancient stone would serve to mark the modern masonry. Weldon stone was suggested, but the delicate sections of some of the mouldings could not be executed in it. It was therefore decided to use the Douling stone of the ‘Chelynch bed’ for all the new masonry, backed up with solid brickwork instead of flint, thus also showing the nineteenth-century work.

We learn that it is now proposed also to cut out and repair some of the defective and decayed stones in the parapets and in the lower part of the turret; and each stone has again been noted in the manner before described. This appears to be an example of “restoration” carried out in a very commend-



able spirit. The only point about which we feel in doubt is that we are informed it is the intention to have a new figure of St. Augustine executed in place of the shattered lower portion of the original figure. The latter, as well as other pieces of the ancient work which will have to be cut out, is to be placed in the Coleridge Museum in the crypt of the library. That is a commendable course to take. But we may suggest, as to the proposed new St. Augustine, that no piece of modern-Medieval carving can possibly harmonise with the old work, or appear otherwise than an intruder. Why not leave the portion of the ancient figure in its place, and put the new one "in the Coleridge Museum?" We should prefer that course of the two.

### Illustrations.

#### ALL SAINTS' CHURCH, WEST DULWICH.

**T**HIS lithograph is from the original sketch design made for the above-named church by Mr. George H. Fellowes Frynne, A.R.I.B.A., London, in 1887, by whom complete and more elaborated designs were made during the following year for the Rev. James Beeby, vicar-designate.

Tenders for the whole work were obtained. The funds being inadequate, it was determined to build the church in sections. The first contract included the foundations at the east end, which were carried out by Messrs. Kynoch & Co., the foundation-stone being laid on All Saints' day, 1888. The second contract in-

cludes crypt, chancel, chapel, vestries, north and south transepts, and four out of seven bays of the nave, the flèche and tower being, for want of funds, temporarily cut off at roof level. The present contract is being carried to completion by the firm of Messrs. J. & C. Bowyer, of Upper Norwood, who have undertaken to complete the work by next May. The salient points of the design are as follows:—

The site has a fall of 28 ft. from west to east. The nave floor taking the western level, space is obtained for a spacious crypt for parochial, heating, and other purposes.

The main scheme of the church shows a lofty nave 58 ft. high and 40 ft. wide and 128 ft. in length, divided into seven double-arched bays, the piers being built of red brick and stone. Panels for decoration are formed over lower arches, and a clearstory in spandrels above.

Three eastern bays open into the north and south transepts. The chancel and sanctuary are the same height as nave, 28 ft. wide, 44 ft. in length. The altar is placed twelve steps above the nave floor level, and a good effect obtained both externally and internally by seven lofty windows at eastern end. The dividing arch between the chancel and nave is enriched with tracery supported by two slender columns rising from the lower screen. A wrought-iron rood screen is to span the spaces between columns.

The northern transept forms the nave of a chapel, the sanctuary of which is placed on the northern side of the chancel; clergy and choir vestries and organ chamber are placed on the south side of chancel. An ambulatory runs entirely around the east end of chapel and

chancel, connecting the northern turret with the vestries. Space is obtained for a musicians' gallery between chancel and chapel, both of which it faces. As the means at the disposal of the architect were wholly inadequate to admit of a tower or spire of large dimensions, he has designed a kind of minaret tower, which, while it is in accordance with the feeling of the design generally, is sufficiently large to admit of a peal of bells. The tower is placed angle-wise to the building, the arches at the base by this means forming a double squint for high and chapel altars.

An apsidal baptistery is placed at the west end.

The present portion of the church will accommodate some 950 persons, and, when complete, about 1,400. The church will be heated by Mr. De Ridder.

The present outlay is about £12,500. The design illustrated was exhibited in this year's Royal Academy.

#### APPLETON THORN CHURCH, CHESHIRE.

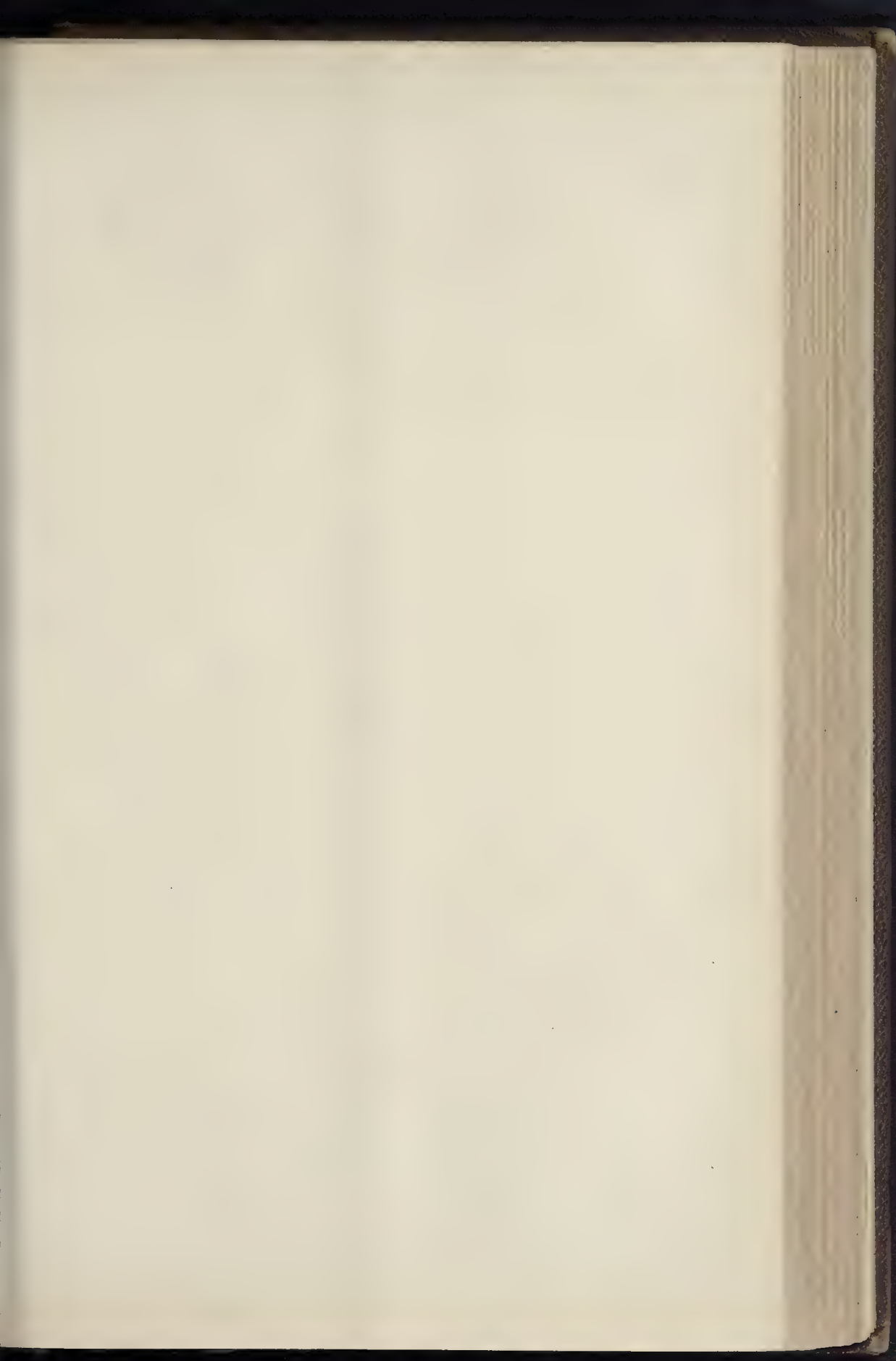
The view of this building was exhibited in this year's Royal Academy Exhibition.

It is a country church, about six miles from Warrington, and was erected at the cost of Mr. B. E. Egerton Warburton, of Arley Hall. The plan is that of a small transeptal church with a single aisle to the nave.

The positions of pulpit and tower-stairs give a quaint finish to the east end of the nave, and a baptistery, at its west end, makes a fitting receptacle for the font at the entrance of the church.

The dedication is to St. Cross, which influ-







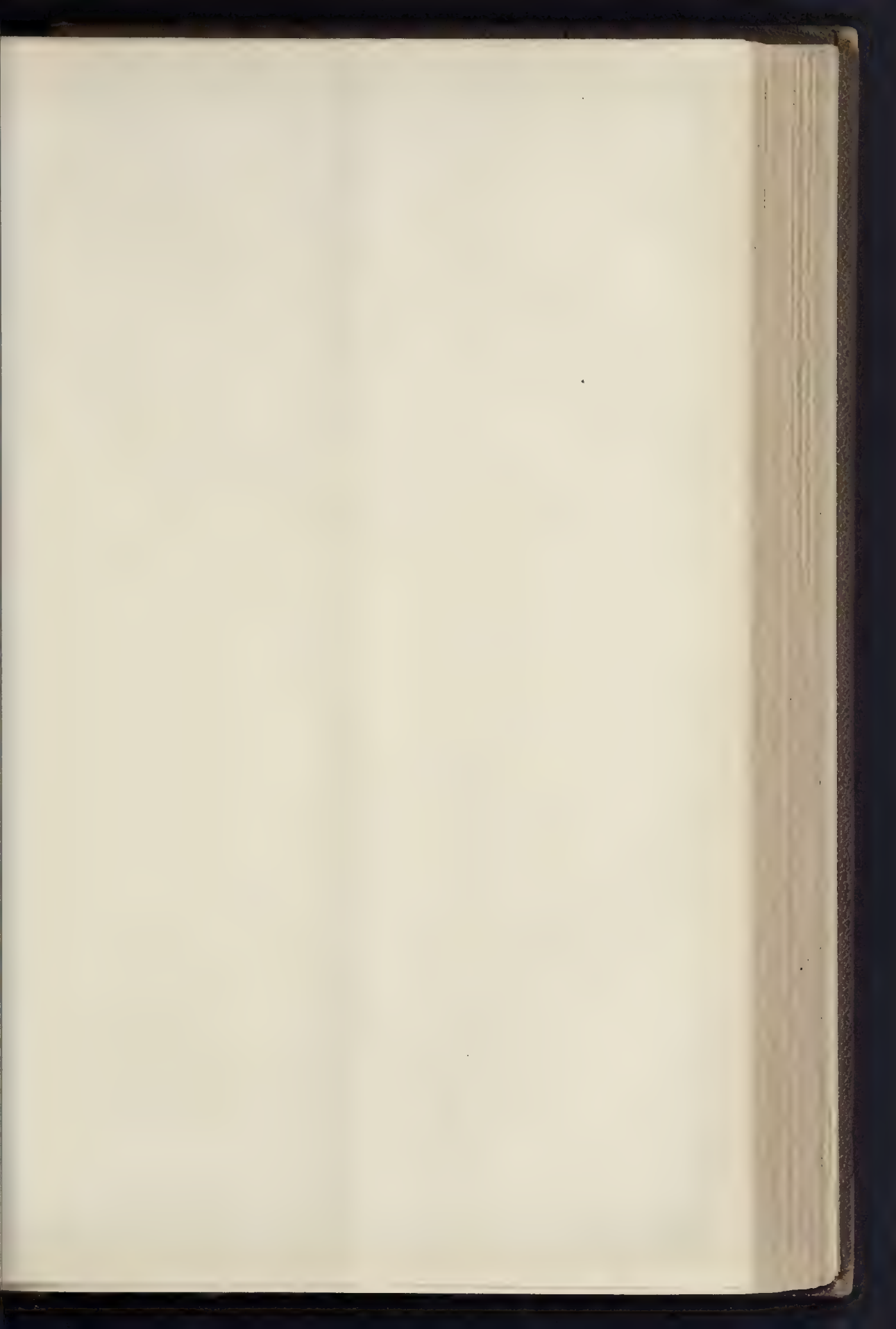




FELLOWES PRYNNE, A.R.B.A., ARCHITECT

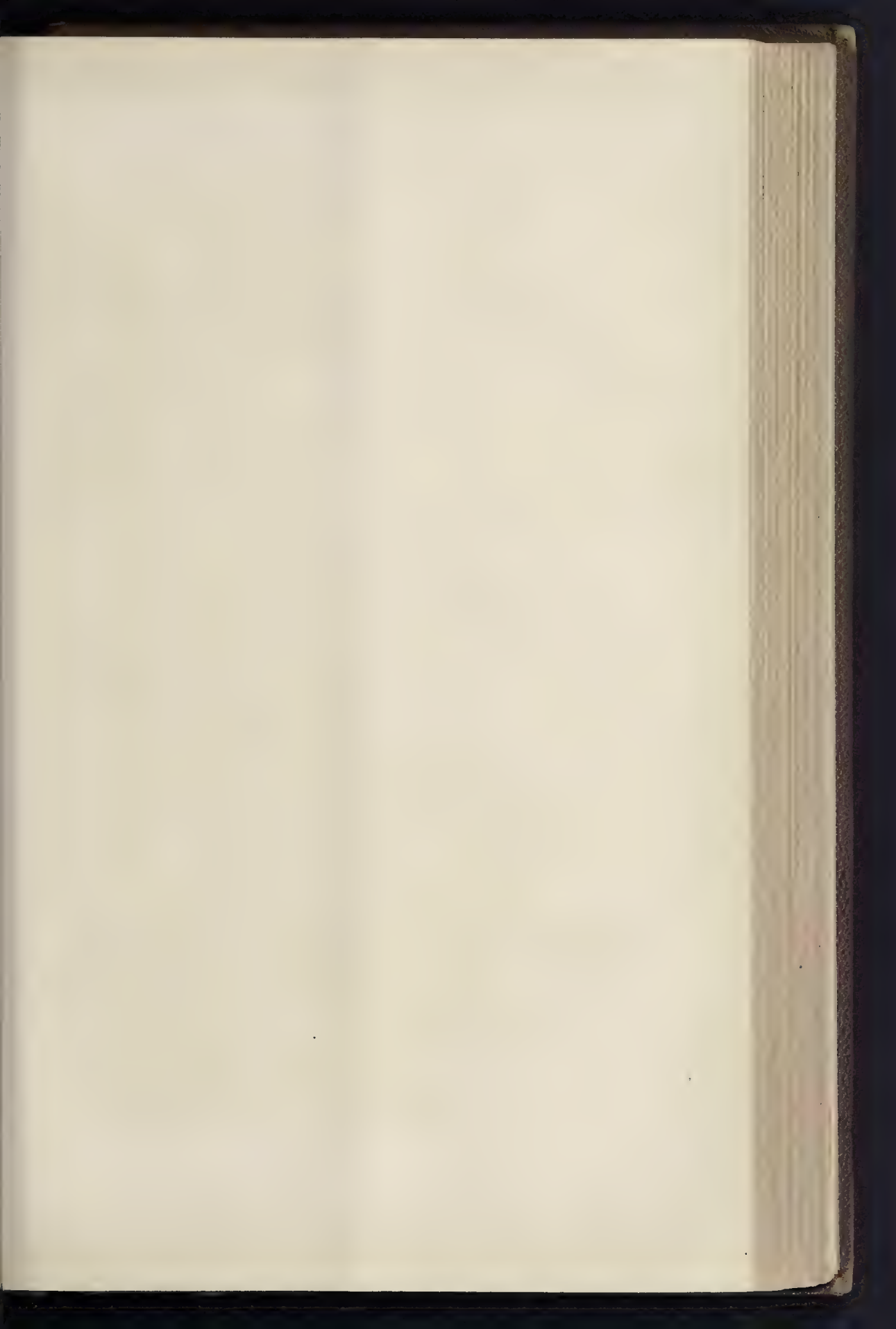












THE BUILDER, OCTOBER 18, 1890.

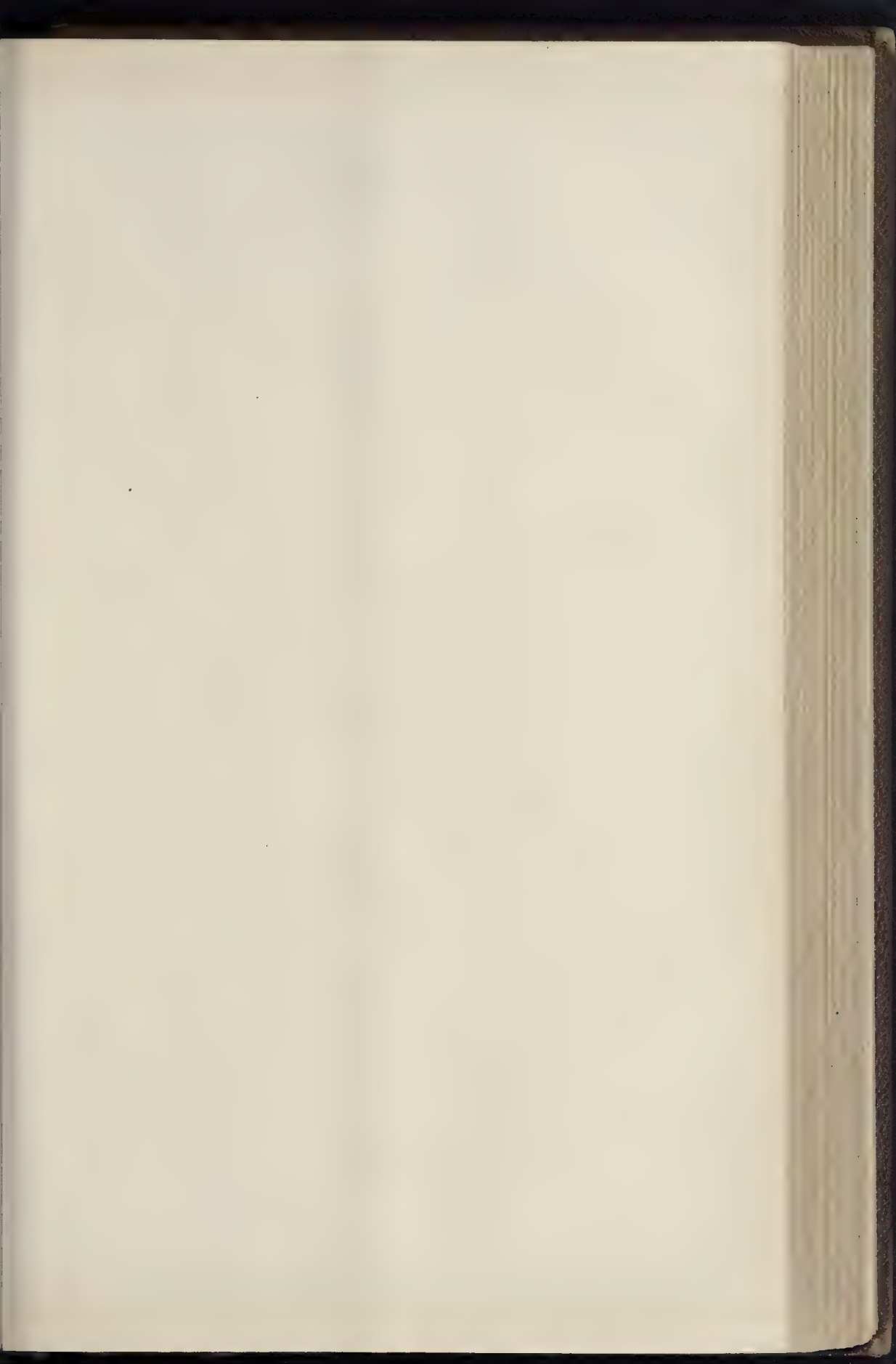
CROOKBURY.  
FARNHAM.  
For Arthur Chapman Esq.



EDWIN L. LUTKENS ARCHT.  
1890

LEONARD MARTIN DELT  
1890





THE BUILDER, OCTOBER 18, 1890.

*Holy Cross Church*  
*Appleton Thorny Cheshire*

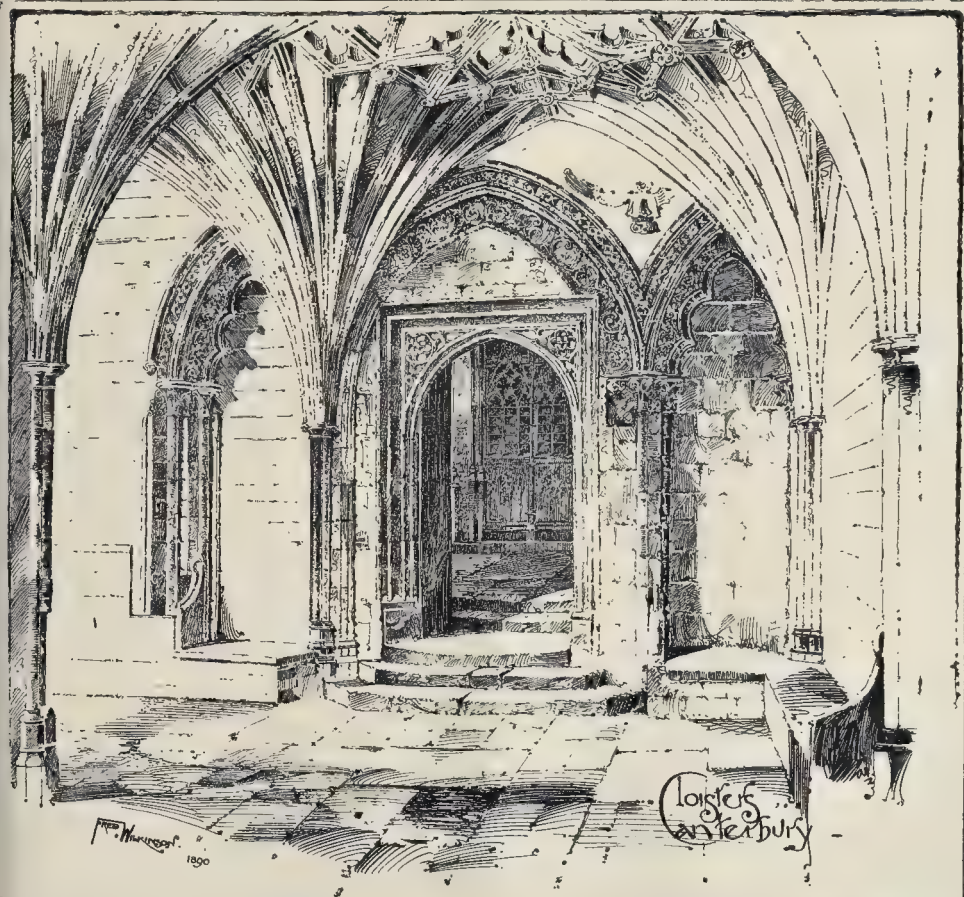
erected by  
R. S. Egerton Warburton Esq.

*Edmund Kirby*  
Architect Liverpool



*The North-East Aspect*



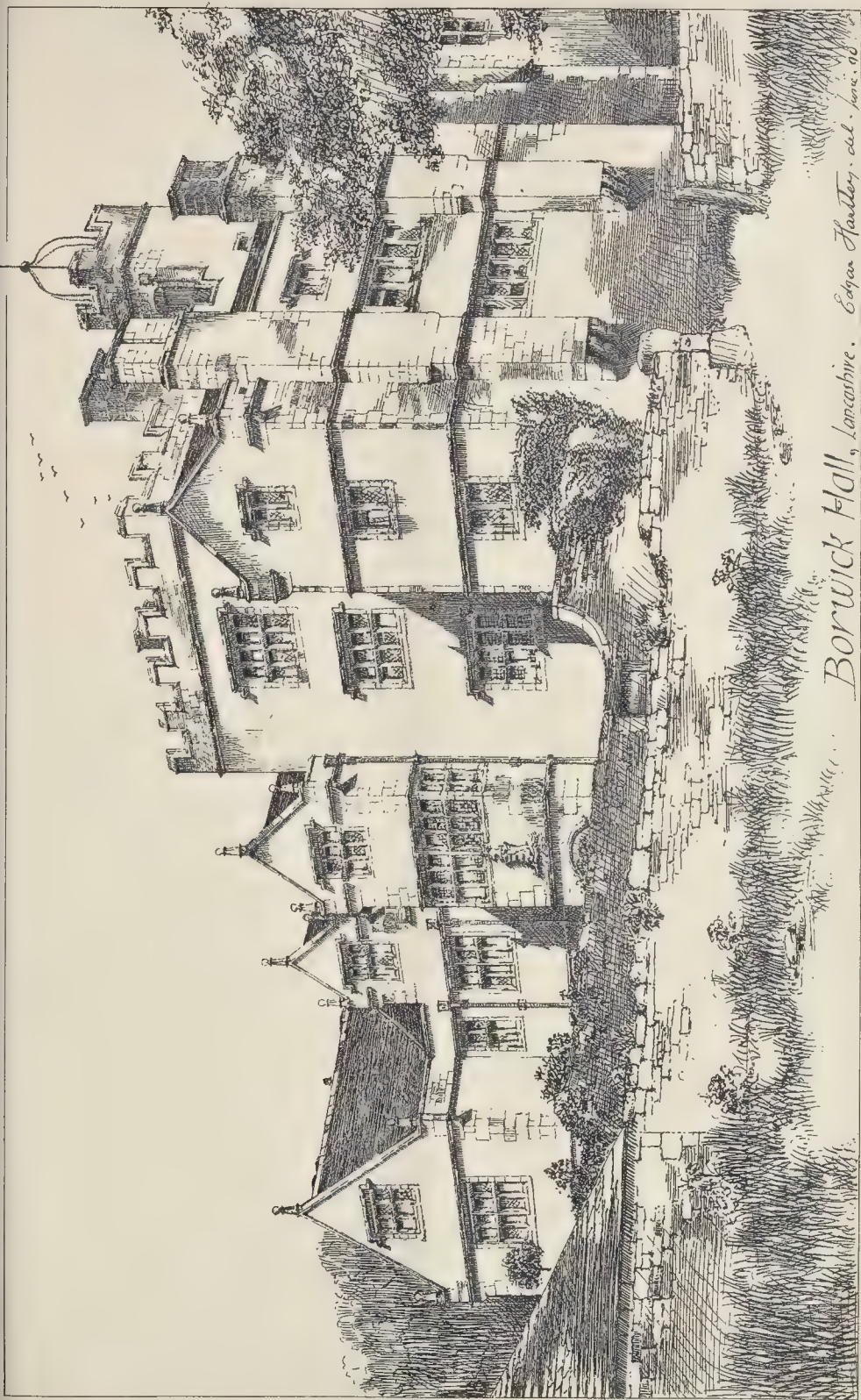


EN. TO. TWO. SHAP. 1 & 2. CH. 12. ART. NO. LANE. CANN. H. ST. LONDON. E.C.

CLOISTERS, CANTERBURY CATHEDRAL. FROM DRAWINGS BY MR. F. WILKINSON.







Borwick Hall, Lancashire. Edgar Hartley, del. June. 98.

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ADDITIONS TO MIDDLESEX HOSPITAL.—MR. KEITH D. YOUNG, F.R.I.B.A., & MR. HENRY HALL, F.R.I.B.A., ARCHITECTS.





need the design in the disposition of the cross-like shape of the plan.

Care has been exercised in laying out the churchyard, and due regard paid to the proper disposal of its drainage before any interments took place.

Besides the church, the donor has added to it a commodious vicarage, with outbuildings.

The contractor was Mr. William Winnard, of Vigan. Mr. T. C. Edwards's roofing, and Messrs. Maw & Co.'s flooring tiles, were used. Mr. John Grundy supplied the heating apparatus. The architect is Mr. Edmund Kirby, F.R.I.B.A., Liverpool.

#### CHLOISTERS, CANTERBURY CATHEDRAL.

At the end of the fourteenth century, the nave and cloisters of Canterbury Cathedral were rebuilt from the designs of Prior Chillewell. Of the cloister, we give two sketches by Mr. F. Wilkinson. The smaller sketch shows a portion of the East Walk, and the larger one the door at the south-east angle of the cloister, which is the principal entrance from the church from the west wall of the north transept, or transept of the Martyrdom, as it is sometimes called. Architecturally, it is an interesting example, of which so many exist, of additions made in the Perpendicular times, grafted on the Old Norman and Early English walls, and designed without any regard for the earlier work. The vaulting, very elaborate and beautiful of its kind, partially hides the arches of the earlier arcade and doorway, and even at the cost of reduction in the size of the doorway, the earlier arch has been filled in round the square-headed doorway of later times. This doorway derives additional interest historically, as standing on the site, and, perhaps, built into the wall, of the structure which witnessed the murder of Becket in 1170, and through which he passed on his flight from the palace to the church.

#### CROOKSBURY, FARNHAM.

THIS house is now being erected on the south side of Crooksbury, near Farnham, from the designs of Mr. Edwin L. Lutyens. It is intended as a summer residence, and is built of red brick with old tiles on roof and for the cladding. The house is planned following the natural levels of the site. There are nine bedrooms, and bath-room, &c., on first floor. There are attics in the roof, lighted by dormers on the north side. The floors in hall and living-room are wood-block with red brick margins.

Messrs. Mitchen Bros., builders, of Shalford, are the contractors.

The drawing from which the illustration is taken was exhibited in this year's Royal Academy.

#### BORWICK HALL, LANCASHIRE.

BORWICK HALL, situate about three miles from Carnforth, was built by the Bindloss family in the year 1559. The various wings and apartments seem to have been added on three sides of an older "Peel," or fortified tower, the walls of the latter being of immense thickness. Among other "Peels" in this neighbourhood, more or less ruinous, are Arnsdale and Wrayholme Towers, the latter of perpendicular date, and once in possession of the Harrington family. [There is a fine but mutilated tomb and canopy in Cartmel Priory Church to the memory of Sir John Harrington.]

One floor of the original Peel at Borwick was used as the chapel, two sides of which were decorated with tapestry previous to the fall passing out of the hands of the Strickland family, of Siergh Castle, to whom it descended by marriage. Adjoining the chapel is the priests'-room, under the floor of which was a "priest-hole," access to which was gained by a trap in the floor. Through alterations to some of this is now made up.

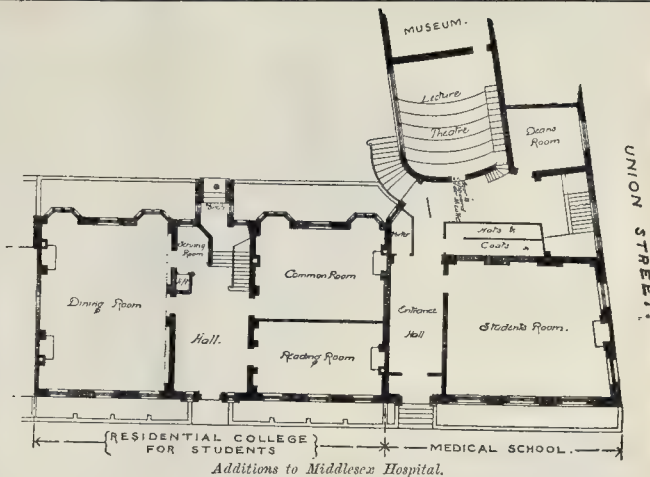
Some good oak panelling remains in the great hall and other rooms.

The archway through the gate-house still shows the masons' marks, indicating the order in which the stones were to be set.

The face of nearly all the external walls is rough cast, which finishes in a line of few inches from external angles and openings, showing the joints of quoins and dressings.

The back wing of this picturesque pile and the gate-house are the only portions now inhabited.

E. HARTLEY.



#### NEW BATHS, ST. GEORGE'S-IN-THE-EAST.

THESE baths were erected, and presented as a free gift to the parish, through the instrumentality of the Rector and private friends. They comprise a swimming-bath, 73 ft. by 30 ft., and forty-three private or slipper baths, a wash-house for towels, &c., and a residence for the superintendent.

The builder's work was carried out by Mr. S. J. Jerrard, of Lewisham, and the engineer's work by Messrs. Slater & Co., of 251, Holborn, from the designs of Mr. Keith D. Young.

#### NEW BUILDINGS, MIDDLESEX HOSPITAL.

THE additions recently made to the hospital buildings comprise a home for trained nurses, a residential college for students, and additions to the medical school. In the perspective view only the two latter are shown.

The garden front of the college, which forms the central feature in the view, is faced with red brick and terra-cotta from the Burmantofts Co., Leeds. Accommodation is provided for thirty-three students.

The new school buildings comprise a luncheon room in the basement, with lavatory accommodation, common room for students, Dean's room, and small lecture theatre on ground-floor; library on first floor, and physiological class-room and laboratory on second floor. The whole of the buildings were carried out by Messrs. Holland & Hannen, from the designs of Mr. Keith D. Young (hon. architect to the hospital) and Mr. Henry Hall.

#### INFLUENCE OF EXTERNAL CONDITIONS ON ARCHITECTURE.

THIS formed the main subject of the first of a series of lectures on the History of Architecture, delivered at the Heriot-Watt College at Edinburgh on Monday last, by Mr. G. S. Aitken. The following is a brief outline of the main points of the lecture:—

The lecturer referred to the various possible sources of the origin of architecture, such as the *tent*, the *cave*, and the *burial-place*, and mentioned seven conditions which had determined its various forms. These were: 1. Climate; 2. Scenery; 3. Location; 4. Material; 5. Tools; 6. Race; 7. Religion.

"A country may have the most genial climate upon earth, but if it be such that the land brings forth spontaneously, and people have only to sit under their vine and fig-tree, the ripe fruit dropping into their mouth, so to say, the mental faculties will in such too favourable circumstances remain languid; with no inducement to physical exertion there will be little or no art culture. It is quite true, on the other hand, that the labour required to maintain a race may be so excessive as to crush out all liking for art. We do not expect to find it fostered in the sweating dens of any of our great cities,—indeed, we hardly look for it where toil is more moderate in its demands, as in the instance in Gray's elegy of the "Ploughman

homeward plodding his weary way." Mental exertion is not possible to the physically weary man. If he wishes to find satisfaction in art, it must be through the medium of others, who may be able to act as interpreters to him. All other things being equal, an equable climate is most conducive to the progress of art. Labour under propitious skies is necessarily less arduous for the body than toil in fitful climes. Man under such conditions has a due amount of leisure for art pursuits, and is physically in a condition to follow them with pleasure.

But what if he have no stimulus to mental activity from the scenery around him? Suppose the country to be as flat as a plain or as dreary as a desert. Though the climate be agreeable, yet if the scenery be unimpressive, we cannot expect to find in such a region the highest developments in architecture. It may be good, but at the same time unimaginative and ponderous.

Egypt will furnish us with an apt illustration of the truth of this,—a fine rainless climate, no scenery such as we understand it, but the bare syenite and limestone cliffs of the Arabian desert to the East and the African watershed to the West; no clouds to suggest the grand forms of peak and dome; the sun rising into the intense cloudless blue, and setting as he rose in a ruddy haze which makes him like a ball of fire. What is there in these physical conditions to produce the highest forms of art?

A third element is *Location*. A centre of civilisation may be in the heart of an inland country, its influence not extending beyond that country; or it may be on the sea-coast, where by maritime intercourse it may be in touch with many lands. In the one case, the art resulting may be expected to be essentially provincial; in the other, generous and eclectic, displaying variety, energy, and character. As illustrating this, Indian architecture, as it was before the irruption of Islam, may be taken. Gorgeous and laboured, it is an exotic in art, which could thrive in no other land, because there is nothing within it with which the people of any other country can feel sympathy.

How different with the lands on the northern shores of the Mediterranean. Take which country on that coast we may, there is always something in its architecture which can bear transplanting to other lands, because its roots are down in the soil of common principle, and in this way its foliage may, in a figure, be said to be for the art healing of the nations.

*Material* is the next matter we take into account. We can imagine the Desert of Sahara becoming by irrigation fertile enough for occupation, but we cannot see what prospect of building there could be even if the dwellers there had all the ambition and energy of a Nimrod. Tent-dwellers they must perforce be, for in so tropical a clime, and without a "boundless contiguity of shade," they could not afford to lose a single palm-tree to help in erecting so much as a solitary hut.

We see how much material had to do in the development of Pointed architecture. If it had been a style depending upon large cubes of



17<sup>th</sup> Centy.

Corner Post



Old Corner-post, Ipswich.



Post and Bracket, Ipswich.

stone it would soon have reached the end of its journey, but as the principles of its construction permit, indeed, encourage, the use of blocks of moderate size, its progress was assured wherever stone and brick were available.

An abundance of material without tools to shape and weld it would avail nothing for the formation of a style of architecture. For just as the invention of type printing has developed literature so the invention of tools has loosened the bonds of the genius of architecture. With hammer and chisel the mason can make the rough stone shapely, can revel in all the intricacies of moulded work, forming here a mystic hollow and there a living line of light, he can garnish a frieze with a reminiscence of the flowers he saw in some woodland nook or on mountain side; or he can crown the shaft with the semblance of leaf and flower with "lithic" birds embowered herein. All this and much else can be done because of tools.

A more important and determining factor in architecture is that of *race*. But, who can explain how it is that the art of one race shall be of a higher type than that of another, that the works of the Greeks should stand head and shoulders above, say, the art of the Hebrew race? An attempt to solve this would be like an effort to discover the principle of life in plant or man.

Our seventh formative condition is *Religion*. Turn to what land we may, and survey in imagination its architectural works, its religious buildings occupy the first place, whether in point of scale, dignity, or elaboration, so that it may truly be said that the history of architecture is mainly the history of the shrines of religion.

And we find the noblest works of this depart-

ment of art associated with those forms of religion which are the most spiritual. The Greek temple is a masterpiece of intellect, but it clings to the earth, and is, as its horizontal lines suggest, of the earth—earthly; on the other hand, the Medieval cathedral soars heavenward, as if it would claim kindred with worlds beyond, and is undoubtedly the realisation of all that goes to make truly good architecture."

#### OLD CORNER-POSTS, IPSWICH.

THE adjoining sketches of two of the numerous quaint features of this kind to be found in Ipswich are taken from a book of illustrations of them by Mr. J. S. Corder, of which some notice will be found under the heading of "Books," in another column. The drawings are considerably reduced in size from the originals.

#### THE PRIOR'S DOOR, ELY.

THE Prior's Door, on the south side of Ely Cathedral, is well known as one of the richest and most elaborate of the many rich and elaborate doors of similar date which are to be found scattered about in various parts of this country. The work belongs to the latter part of the twelfth century, and, as was usual at this period, the whole doorway is overlaid with a wealth of ornament which was not surpassed at any later time. The carvings are in a very fair state of preservation, except, perhaps, close to the ground-level, where they are partly obliterated; they represent in the tympanum our Lord in glory, with attendant angels, the

shafts and piers being covered with grotesque figures, including the signs of the Zodiac.

The jointing is noteworthy, more especially in the outer arch, and the method in which the design of the tympanum sculptures has been arranged to work in harmoniously with the stones and their joints is interesting. Seen by the light of the afternoon sun, this doorway has a very beautiful object.

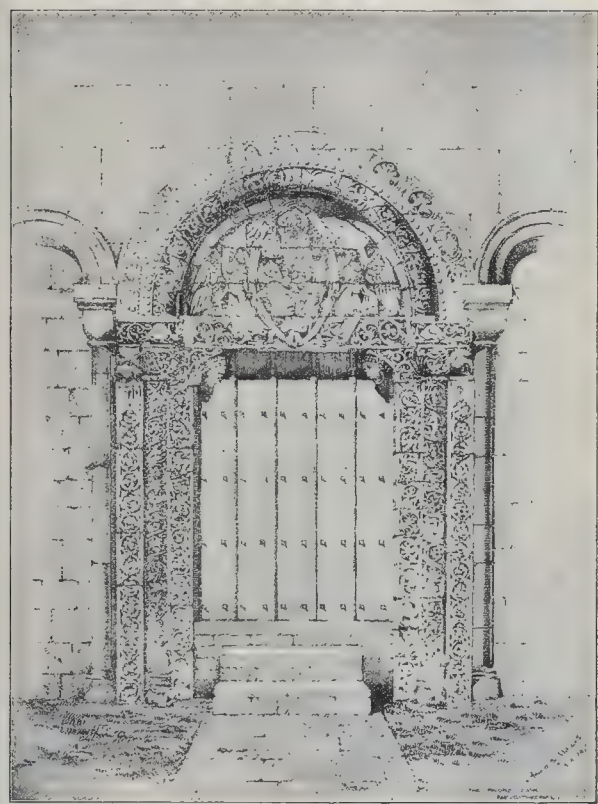
#### THE LONDON COUNTY COUNCIL.

THE ordinary weekly meeting of the London County Council was held on Tuesday afternoon last at Spring-gardens, the Chairman, Sir John Lubbock, presiding.

**Jobbing Contracts.**—The Standing Committee brought up the following report, dated October 8:—

"In a report that was before the Council on April 22 last, we recommended that with a view to avoiding the possibility of error in the settlement of the accounts under jobbing contracts the measurements of work done should be made by the contractor and checked by the official of the Council. A suggestion, however, having been made that there might be an improvement in arrangement with respect to contracts generally the matter was referred back to us for reconsideration. We have now to report the result of our further deliberations, in which we have been aided by a sub-committee composed of some of our own members, with the addition of Colonel Edis and Mr. Brereton, whose professional knowledge and experience enabled them to offer valuable suggestions. Having considered the report of the sub-committee in conference with the Chief Engineer and the Architect of the





The Prior's Door, Ely.

uncil, we have arrived at certain conclusions which we now submit to the Council, and which, adopted, we believe will be productive of considerable economy in the carrying out of the Council's works. Before stating them, however, we may mention that it appeared to us in the course of our investigation that some of the works hitherto done under the jobbing contracts might be carried out more economically if tenders were obtained for them. This being the case, we are of opinion that, whenever practicable, tenders should be obtained, the recommendations which we now make it will be observed that we distinguish between the Engineer's and the Architect's departments, as regards the course to be followed in large contracts, the different circumstances of the two cases appearing to require a different procedure. Our recommendations are:—

(a) That a quantity surveyor be employed by the Council (whenever required) to prepare bills of quantities for all large works, the Council accepting responsibility for such bills of quantities.

(b) That copies of the bills of quantities be supplied, with the specifications, drawings, &c., to persons who wish to tender, and that each person invited to tender on the bills of quantities thus supplied.

(c) That, in the case of large works carried out under the direction of the Chief Engineer, the measurements be made as the work proceeds by an assistant in his department, who should be placed in direct charge of the works in progress, and that payments to the contractor for the amount of work executed be calculated according to the prices in the bills.

(d) That, as regards the smaller works carried out under the direction of the Chief Engineer, a quantity surveyor having experience in civil engineering work be appointed in the first class at the commencing salary of 200*l.* a year, and that he be directed to abstract and bill his own measurements.

(e) That, in the case of works carried out under the direction of the Architect for which bills of

quantities have been prepared, the extras and omissions be measured by the surveyor who has taken out the quantities, and valued by him in accordance with the priced and signed bills of quantities.

(f) That for all other works in the Architect's and Valuer's departments the following appointments be made under the Architect, viz.,—

A measuring surveyor in the first class at the commencing salary of 200*l.* a year.

A clerk for abstracting and billing dimensions in the third class at the commencing salary of 100*l.* a year.

(g) That, whenever practicable, instead of having works executed under the jobbing contracts, tenders be obtained.

We may add that, if the Council adopts our first recommendation for the appointment of a quantity surveyor, we propose to invite by public advertisement applications for the appointment.

The report and its recommendations were agreed to without discussion.

*Vauxhall-bridge.*—The Bridges Committee reported that they had given consideration to a petition which had been received from the Vestry of Lambeth praying that Vauxhall-bridge might be superseded by a modern structure. The Committee, after hearing a deputation in support of the petition, had come to the conclusion that, although the bridge was narrow, the gradient steep, and the number of piers tended to obstruct the river traffic, the matter was not urgent, and might be delayed till the other works which the Council had in hand had been completed, and they recommended that the Lambeth Vestry should be so informed.

Mr. Myer moved that the matter be referred back to the Committee for further consideration, on the ground that the matter was of real urgency. He said that the Engineer of the Council had reported that, with regard to some of the piers of the bridge, viz., Nos. 3, 4, and 5 from the Middlesex end, it had been found that

the bed of the river adjoining them had been scoured away by the tide to a level below the bottom of the timber cradles, and in the case of pier No. 3 it was ascertained that the current had actually undercut the pier for several feet inwards, and to a depth of 9 in. below the bottom of the cradle. The Engineer had also reported that the ebb-tide passing under the bridge had been calculated to flow through the central arch with a velocity of  $7\frac{1}{2}$  miles per hour, and had been a fruitful source of accidents.

The amendment having been seconded, Mr. Osborn, the Chairman of the Bridges Committee, said that the Committee were fully cognisant of the Engineer's report, but Mr. Myer had omitted to state that the hollows caused by the scour of the river under the piers of the bridge had been filled up with slag and cement concrete, and the bridge was now in a safe condition, and the question of its rebuilding could very well wait until three or four years later, when the work would no doubt have to be taken in hand.

The amendment was negatived by a large majority, and the report of the Committee was adopted.

*The Sewage Question.*—The Main Drainage Committee brought up a report recommending that the tender of Messrs. Schlesinger, Davis, & Co., amounting to 28,000*l.*, for the construction of a new sludge-ship, be accepted.

Mr. Aneas Smith moved that the matter be referred back to the Committee, on the ground that the Council would not be justified in making such an expenditure until the report of Sir Benjamin Baker, who had been paid 600 guineas to advise them in conjunction with their Chief Engineer on the whole subject, had been received.

Mr. Lidgett seconded, and Mr. McDougall and Mr. Benn supported the amendment.

On the other side, Mr. Burns urged that whatever the recommendations of Sir Benjamin Baker might be, it would be impossible to carry them out in less than four or five years, and they must continue their efforts to keep the river as clean as possible in the meantime.

Mr. Arthur Arnold, the Chairman of the Committee, said the vessel would be required because it would be almost criminal not to utilise to the utmost extent the works at Crossness, on which three-quarters of a million sterling had been spent, and which would come into operation about the beginning of July next.

On a division, the recommendation of the Committee was approved by a large majority.

*Sky-Signs.*—The Building Act Committee reported that their attention had been called to the erection of "sky-signs" upon various premises in the metropolis without the licence of the Council having been either applied for or obtained. As the Committee considered the erection of "sky-signs" most objectionable and dangerous, they recommended that the Solicitor be instructed to take the necessary proceedings in a test case.

As an amendment to the recommendation of the Committee, Mr. Beachcroft moved, "That it be referred back to the Committee to frame By-laws for the consideration of the Council either under Section 56 or 57 of the Metropolitan Building Act, 1865, or under the 16th section of the Local Government Act, 1888, as the Solicitor may advise, for the purpose of controlling the structures known as sky-signs." He maintained that by taking a test case to the police-court, where they were pretty sure to fail, they would abandon all the rights they possessed, and as the Council had large powers to frame regulations, rules might be framed which would meet the case.

On the other hand it was argued that if a test case, which could be brought in a police-court at very little expense, proved successful, the Council would be able to deal with the nuisance, and, if successful, they would be in a strong position in going to Parliament to ask for authority over sky-signs.

On a division the recommendation of the Committee was agreed to.

*Parks and Open Spaces.*—On the recommendation of the Parks and Open Spaces Committee, the necessary steps were taken to complete the purchase of Brockwell-park, Hernehill. The consideration of proposal to negotiate for the purchase of 74 acres of pine forest adjoining Bostall-heath was adjourned for a week.



*Alleged Nuisances from Brick-burning, &c.—*  
The Sanitary and Special Purposes Committee brought up the following report:—

"Our attention has been directed from time to time to the serious nuisances arising from brick-burning, ballast-burning, and kindred trades. These nuisances mainly arise from the evolution of large volumes of offensive effluvia and smoke in the burning of bricks in clamps and in the burning of ballast, and also from the burning of the refuse-matter or soft core which is not suitable for use. On account of the peculiarly offensive nature of the vapours, and the distance to which they are at times carried, the nuisance extends over considerable areas, which are often thickly-populated districts. We are satisfied that the discomfort experienced in London from these sources is more considerable and widespread than perhaps from any other source. The 16th section of the Local Government Act enables the Council to exercise the power given by the 23rd section of the Municipal Corporations Act, 1882, of making by-laws for the good rule and government of the County, and for the prevention and suppression of nuisances not already punishable in a summary manner, and we consider it most desirable that by-laws dealing with the nuisances referred to should be made by the Council under this section without delay. We have prepared and now submit the following by-laws for this purpose—

'By-laws for the prevention of nuisance in brick-burning, ballast-burning, brick-making, tile-making, pipe-making, and the burning of soft core, made in pursuance of Section 16 of the Local Government Act, 1888, and Section 23 of the Municipal Corporations Act, 1882:—

1. Every person who carries on within the county of London any of the following processes,—that is to say, brick-burning, or ballast-burning, or brick-making, or tile-making, or pipe-making, or the burning of soft core, or any other like process, shall cause every such process in which any offensive effluvia, vapours, or gases are generated, to be carried on in such manner that no offensive effluvia, vapours, or gases shall escape into the external atmosphere, and shall cause all such offensive effluvia, vapours, or gases to be effectually arrested or destroyed.

2. Every person who shall offend against the foregoing by-law shall be liable for every such offence to a penalty of five pounds.

Provided nevertheless, that the justices or court before whom any complaint may be made, or any proceedings may be taken in respect of any such offence may, if they think fit, adjudge the payment as a penalty of any sum less than the full amount of the penalty imposed by this bye-law.

We recommend—

'That such by-laws be made, and the necessary steps taken for obtaining the confirmation of the Local Government Board thereto.'

The report and recommendations were agreed to without discussion, and, after the transaction of other business, the Council adjourned.

#### SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.

THE opening meeting of the new session of the above Society was held at the Montgomery Hall on Tuesday night, and there was a large attendance of members, including the President (Mr. F. Fowler), Messrs. C. J. Innocent, J. B. Mitchell-Withers, E. M. Gibbs, W. F. Hensell, W. H. Lancashire, C. Hadfield, J. F. Wightman, E. Winder, jun., J. Winder, H. W. Lockwood, J. Smith, and others. Letters expressing regret at non-attendance were read from Mr. J. F. Massie (Wakefield) and Mr. T. J. Flockton. The President in his address congratulated the members on keeping up their numbers, and on the fact that the Society had a good balance to its credit. The main object of this Society was to look after the interests of their profession, and to stand by one another. He trusted they would all continue to take an interest in the well-being of the Society, and do their best to enlarge its sphere of usefulness. The proceedings terminated with a vote of thanks to the President.

GIFT BY LORD DERBY TO THE LIVERPOOL FREE MUSEUM.—It is announced that Lord Derby has just presented to the Liverpool Free Museum a valuable collection of prehistoric implements illustrating the stone and bronze periods of Europe and America. The collection has arrived safely at Liverpool, and is now being prepared for exhibition by Mr. T. J. Moore, the curator of the Free Museum.

#### Books.

*A Manual of Wood-carving.* By C. G. LELAND, F.R.L.S., M.A. Revised by JOHN J. HOLTZTAPPEL. London: Whitaker & Co., and Holtzapfel & Co. 1890.

THIS is an admirable little book, combining artistic feeling for wood-carving as an art with useful practical information. We have occasionally had to notice books on wood-carving in which, while the practical information given as to the handling of the tools was useful and well arranged, the illustrations were in such wretched taste as to be injurious rather than helpful to the student who wished to become anything better than a wood-chopper. In Mr. Leland's book there is not only much good critical teaching from the artistic point of view, but the illustrations are quite above the average of such small manuals, and many of them show a great deal of artistic feeling and fancy.

The book commences, as every such work must commence, with a description of the tools required, and the method of using them, and then proceeds to describe and give illustrations of various classes of work, commencing with the simplest, indenting and stamping, going on to cutting grooves, cutting simple leaves, and the "sweep-cut" or freehand carving, to which the author rightly attaches much importance, as being that which really separates carving proper from mere cutting. "Amateurs who have taught themselves," it is observed, "can generally cut or chip only straightforwardly, they cannot turn or carve a leaf with a sweep"; and the student is recommended to practise the freehand cut on waste wood, so as to master the action, before seriously attempting to carve out a subject. He also strongly recommends the student to model a difficult bit of detail, or at least to draw and shade it carefully before beginning: "the reason is this, that having its principal points in the memory, it is much easier to reproduce them when cutting in wood; we know when and where to turn the hand or the tool." We are quite in agreement with the author in his advice not to undercut leaves to the extent of trying to make them look thin and natural, till they are as fragile as paper ("much more fragile," in fact). "This is greatly admired as indicating 'skill,' and it certainly demands skill of a common order to effect. But it requires a much higher and nobler kind of art and will to make the leaves strong and firm, even if we conventionalise them, so that their curves are really beautiful." The object in carving foliage being in fact not to imitate it, but to imitate its beauty in such a form as can be best represented in wood.

Many a person will consider the author heretical in saying that polishing and finishing with sandpaper is not necessarily a fault. He should no doubt learn to carve clean and well without glass or sandpaper, "but there is no law why he should go no further." This is a little bit of re-action against the contempt which has been poured of late years upon sandpapered work; but we hope it will not be taken by students as a kind of licence to offend in this way. Another suggestion in the book we do consider decidedly heretical, that of appliqué carving (of an animal in low relief for instance) fixed to a previously-carved diaper ground. No doubt "effects" are to be produced in this way; but they are not legitimate effects, and one always feels a sense of dissatisfaction from the knowledge that the thing is not a solid whole, and is likely to separate some day. Another point we must make exception to is the three-legged stool which forms the tail-piece at the end of the last chapter, and which is vile. It is true, as the author implies, that it is a mistake to carve such stools on the seat, if they are to be used as seats at all, and ornament is better applied on the legs; but to encrust the legs with realistic foliage twining irregularly round them is an utter misapplication of carving, and entirely at variance with the quasi-architectural methods which ought to preside over furniture design. But in the main this is one of the best small books of its kind that we have seen, and should be looked after by those who desire to try their hands at the fascinating art of wood-carving.

*Structural Mechanics.* By R. M. PARKINSON, A.M.I.C.E. London: George Bell & Sons, 1890. Whitaker & Co.

MR. PARKINSON'S little handbook on "Structural Mechanics" is an addition to the literature of a branch of engineering which has already been so ably treated by many eminent men that it is somewhat surprising to find one who cares to occupy his time in travelling over such old ground again.

The author deals with the usual subjects—strength of beams, columns, and arches—explaining the methods of calculating the stresses upon them under various conditions of loading. It is to be regretted that throughout the work the word *strain* is used where *stress* should be written. *Strain* is the deformation or change of shape resulting from *stress*, and should not be used in any other sense. We also think in a handbook of this kind, which is written for practical men, it is a mistake, when dealing with the effects of heat, to measure the temperature by the centigrade rather than the Fahrenheit scale; for, although this may be desirable in some scientific works, it is unlikely to be appreciated by the class for which this book is written.

At the end of each chapter will be found a set of examples which cannot fail to be of much service to the student, as they are the most cases questions which occur in every practice, and the author has certainly added very much to the value of his book by judicious selection of these problems, the solutions of which he has given in all cases.

*The Old Corner-Posts of Ipswich*, with illustrations in photo-lithography from original sketches. By JOHN S. CORDER, architect, Ipswich; S. H. COWELL, 1890.

THE literary portion of this work was an essay read before the Ipswich Fine Art Club during the present year, by Mr. John S. Corder, who names our readers will remember as the author of some interesting collections of sketches published from time to time in *The Builder* under the title of "Wayside Notes East Anglia." The essay consists of a sketch of the history of Medieval woodwork with some remarks on the special features illustrated, the corner-posts of the timber houses. These massive posts came necessary where a half-timbered house with an overhanging upper story happened to be the corner house of a street, the oversailing story had to be carried round the angle instead of being merely a projection in one plane. These posts were very massive; they not only had to carry a considerable weight, but to resist the effect of the accidental collision of any vehicle turning the corner carelessly.

There seems to have been in ancient Ipswich a special love for carving these posts, so as to render them rich and decorative objects. The author has no doubt that in olden times Ipswich abounded with them, but they have all disappeared except nine, and of these the last figured in the book have been been removed from their original situations and taken away from the town.

The author has done an excellent piece of work, and produced a series of very interesting drawings, in preserving a record of objects picturesque in themselves, and the life of which is naturally so very precarious. The drawings are large and carefully executed, the subjects are arranged as nearly as can be judged in order of date. The first is a fifteenth-century one from the junction of St. Nicholas street and St. Nicolas street. This is a rich of panel and tracery work, but has not the force of design or force of execution of some of the others.

The five following examples are of late Medieval, all of the surface tracery of design except No. 6, which is a plain piece with a carving of birds and griffins between two mouldings at the top, with a cresting of the whole forming a kind of impost for a heavy curved corbel which carries the arch. No. 8 is a seventeenth-century example with a demon figure squatted under the angle of a boldly-carved horizontal cornice over the arch. No. 9 is a much more ornate example, very florid taste, but interesting as an example of spirited execution; Renaissance ornament executed in the rough manner of a country carver. The plate showing this and the highly-picturesque group of houses which it forms a part, is reproduced to a small scale on page 310. In the extraordinary example from Gooding's coffee house (plate 3) the decorative treatment is carried up through both stories of the house, the oversailing story on each story being carried by a grotesque, dropical-looking figure stooping with his hands on knees and appearing to carry the



on his bent shoulders; each of these groups stands on a pedestal carried on the heads of a group of three figures, the lower group appearing to represent Christian and his two pagan personages. This is one of those now removed; a more curious piece of work of its kind could hardly be found, though it is more grotesque than graceful. The thirteenth plate in the collection is a bracketed post from a house in Carr-street, not a corner-post; a demon figure interlaced with rap work, and carried on a column with a deeply-carved Corinthian capital. Of this also I give a reduced facsimile on page 310. Mr. Corde's thin folio should be of interest to those who like to secure illustrations of ancient carved work before it is removed in the course of the rebuilding which is now invading our old towns more or less.

Correspondence.

To the Editor of THE BUILDER.

BAND-SAWS AND OTHER SAWS.

The following is the translation of a communication received from MM. F. Arbey et Fils, of Paris, reference to the article by Mr. Worssam on 'The Conversion of Timber by Machinery,' which appeared in the *Builder* of September 20.

Sir,—In reference to the article by Mr. Worssam on the conversion of timber by machinery which appeared recently in the *Builder*, perhaps our readers may be interested in knowing the result of our long experience in regard to one class of machines referred to, those called band-saws.

In the first place large band-saws cannot be used except for straight cuts. We wish to call attention to the numerous drawbacks which we have found in our experience, in the employment of this class of saw.

In the first place, the difficulty of sharpening is very great. It is a question of sharpening a long ribbon of steel, sometimes up to fifteen metres in length. There are no doubt machines for sharpening them, but it is not easy to get good results by these means. It is in fact impossible mechanically to obtain a perfect and regular set in these long bands, which are often not of the same temper throughout. It is necessary therefore to give or to complete the set by hand, and to employ a skilled workman for this purpose.

Another drawback with band-saws, which often escapes the notice even of practical men, is this: to obtain a perfectly straight cut it is necessary to use the saw at the greatest tension it will bear, causing very heavy friction on the pulley bearings, with consequent loss of some of the power expended in driving the saw. If the saw is not in sufficient tension, what happens? It deviates a little from the straight line, and at once begins to heat from friction in the working, and with this heating the blade sensibly lengthens.

Another being very thin, frequently break; it then becomes necessary to solder them, perhaps in two or three places. Each of these points causes a jar in the working of the saw, and one cannot obtain the same tension as before; hence a great source of imperfection in the work.

If it is answered, why not have larger and heavier blades, we reply that in that case the tension for working must be still greater, the pulleys heavier, and the proportionate cost of working increased, not to speak of the increased cost of the blade itself.

All these causes tend to vitiate the results of band-sawing. In fact, the planks or panels cut by band-saws never are, and never can be, of completely uniform thickness throughout, and do not have a good sale, good wood being spoiled by bad sawing, and in countries where wood is dear this is a serious matter. In England we believe fine cutting is more sought for than in this country; and fine cutting depends mainly on the regularity of the blades in curves or in irregular-shaped cuts. But to obtain from some of the teeth not being cleanly set, and where there are such a number of teeth as in these long band-saws it is most difficult to avoid this.

The band-saw has its own special application, and within that limit is a spiteful-looking instrument, it is a very attractive-looking instrument, it makes little noise, and it has come into fashion (and in France there are fashions in machines as well as in ladies' dresses), and it has been pushed by the makers of this class of saw in their own interest.

The one characteristic merit of the band-saw is the continuity of its cut. Vertical saws, say the makers, cut out in descending, the time occupied in raising the blade again is lost, and the cut is discontinuous. A French manufacturer has how-

ever surmounted this difficulty by making a vertical saw with teeth to cut both ways (*denture alterne*). The arrangement of the teeth is such as to allow of the free escape of the sawdust; and owing to the great speed of the saw the cutting is virtually continuous. This saw is working in the French, Portuguese, and Brazilian Government dockyards, and is reported to have very satisfactory results.

The sharpening is done very quickly, and can be done while the saw is working, and the change of the blade demands only three or four minutes. The length of the saw is not more than 2 metres at the most. The power employed is completely independent of the tension of the blade, which is stretched in a frame that bears all the strain. Soldering for breakages is never required.

The blade is in high tension, preventing an inconvenience familiar to all sawyers with the use of band-saws, and which is called in France *tirage à cour*. The flexible band-saw has a tendency to sverre towards the heart of the wood, interfering with the true vertical direction of the cut. Consequently, in France the wood sawn by the vertical saw above described commands 15 to 20 per cent. better price than that sawn with the band-saw.

The vertical saw blade lasts much longer than the band-saw, and the blade is only one-fourth the cost to begin with. It will saw 150 superficial metres of wood per minute. It has also been applied to machines with several blades for sawing up square blocks. Both machines, the single and the multiple blade, were at work continuously at the Paris Exhibition of last year.

P. ARBEY, Ingénieur des Arts et Manufactures (Maison F. Arbey et Fils)."

SKY-SIGNS AND ADVERTISEMENT BOARDS.

Sir,—As the matter of sky-signs and advertisement boardings and boardings has been made the subject of special comment in your last issue, I may be allowed to observe—in response to your remark, "perhaps some district surveyor will next take up the subject"—that the subject has already been taken up by myself; and the ruling of the Bow-street Magistrate, obtained in the following case (only one out of several of those which I have brought before them), has been so distinct and clear that the matter may be considered as, so far, settled in this district, I hope:—

First: D. S. St. Giles and St. George v. Willing (reported fully in *Banister Fletcher's* edition of *Building Act, 1882*, pages 20-21, &c.). As regards boarding affixed to walls of houses in Little St. Andrew-street, for advertisement purposes. This kind of boarding is considered as especially dangerous in case of fire, as it covers all windows and openings and prevents their use for light or air. Notice was required for the "work" as done "in, to, and upon" a building, and its removal was required as being woodwork irregularly fixed thereon. Since then Messrs. Partridge and others have several times been required to remove similar woodwork from face of various buildings, and have done so, the placards being now fixed to the brick face without any woodwork, and so without covering up any windows or openings.

Secondly, as to *sky-signs*. The District Surveyor v. Sage, Bow-street, 1888: summoned for want of notice, and to take down sign as a dangerous structure. It was decided at Bow-street that notice must be given to the District Surveyor for this as work done "in, to, and upon" a building, and that as a dangerous structure it must be made safe, &c.

Oxford-street.—This case against owner of No. 51, New Oxford-street, was peculiar, and shows how easily the best intentions are frustrated by interests of a different kind springing up in opposition (in this case that of Crown property). At the end of Shaftesbury-avenue, where it enters Holborn, was the rough flank wall of the building No. 51, exposed by the pulling down of the adjoining house to form sufficient width for this entry to the new street. This rough wall was made into a cemented architectural front, with panels, &c., at the cost of the ratepayers, through the Metropolitan Board of Works. These panels were supposed to be simply architectural decoration, and being a very poor kind of finish for such a fine thoroughfare as Shaftesbury-avenue, and standing in such a commanding position, it was suggested by some good citizen that it would be just the position for a good fountain, and an offer was made to erect one entirely at private cost. But this was refused, because for one thing any citizen had leased these panels for advertisements, and had required a sham shop front to be erected for the same purpose. These panels are now filled in with staring enamelled iron advertisements, but the sham shop front has been prevented by the application of the Building Act. Surely it would only be a graceful thing for the Crown to forego any rent it may receive for these panels being filled with advertisements and allow the Local Authority—the District Board—to arrange with the worthy citizen who would bear the expense himself to erect his fountain, and so take away the reproach attaching to this particular spot at present through the inconsistent action of the Crown, or the Office of Works. C. F. HAYWARD.

October 11, 1890.

R.C. CHURCH OF ST. JAMES', SPANISH-PLACE, W.

SIR,—With reference to a paragraph in your issue of the 11th inst., I beg to say not only are the dressings of the exterior of Portland stone, but the whole of the rock-faced ashlar as well.

As this is the first building in London where this has been used, I thought, perhaps, you might care to mention the fact in your next issue.

This rock-faced ashlar was supplied by myself. Portland. F. J. BARNES.

The Student's Column.

HOT-WATER SUPPLY.—XVI.

IMPROVED AND OTHER SYSTEMS; PECULIARITIES NOTICED FROM EXPERIMENTS, AND THEIR RESULTS IN PRACTICE.

PERHAPS one of the most interesting, as well as instructive, things that it is worth anyone's while to erect, is a model hot-water apparatus; its construction is simplicity itself, and to those who are at all interested it will repay the trouble. It would prove a most expensive undertaking to have the pipes especially made of iron, and the joints in themselves would possibly deter the most ardent, and what would prove most fatal to this arrangement is that, when erected, results could only be tested by feeling the different parts of the structure and judging by the temperature outside, the same as in an ordinary house system.

If we make the reservoir of glass, and use a small-sized glass tube (say  $\frac{1}{4}$  in.) for the pipes, we then have an apparatus that will permit of its interior phenomena being thoroughly investigated, every peculiarity, however trivial its action, being instantly noticeable; and, provided the proportions are about true, every reliance can be placed on it as a model of the actual working of a system. Amber dust, obtained by filing up a piece of broken pipe mouthpiece (provided it is amber), will render the movements of the water easily perceptible, as it is a material the particles of which will be found to remain perfectly still in still water, and only

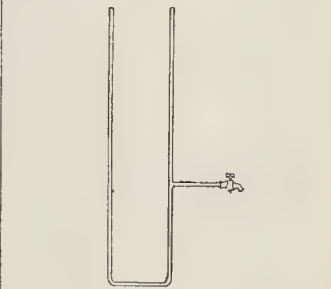


FIG. 35.

move as the particles of water propel them. The glass tube can be jointed with rubber tubing.

Perhaps one of the most useful results noticed in an apparatus of this kind, and which has proved to be a result of almost every day utility to many who have noticed it, is that water proceeds both up and down a flow-pipe in equal volume when a draw-off tap connected to that pipe is opened; this is a perfectly natural result, as any work on hydrostatics shows us that in an apparatus of this kind the water cannot very well proceed from one way only, yet if a number of intelligent hot-water fitters were asked from whence does the water come that flows out of a tap when it is opened, whether up the flow-pipe from the boiler or down the flow-pipe from the tank (on the tank system), the chances are that not one will say that the water proceeds equally half each way, and the consequence is that numberless mistakes occur, some of them very perplexing to the uninitiated.

To more clearly explain the phenomenon in question, if we erect a double tube, as at fig. 35, and insert a draw-off tap in it at any point, as shown, and we then open the tap, what takes place? The water that issues from the tap does not wholly proceed from the pipe above the tap, neither does it wholly proceed from that portion of the pipe below, for it will be



found that as the water flows so will the level of water in the pipes be lowered exactly equal in each pipe, and this is a sure indication that the pressure both down and up is exactly equal, the same as if the lower part of the tube were taken away, as in fig. 36. This will make it



FIG. 36.

clear that we must expect water from both directions when a tap is opened anywhere in the circulating pipes of a hot-water apparatus, as we have only to place a boiler at the lower end of the pipes (fig. 35) and a reservoir at the top extremity to have a tank apparatus almost complete.

The commonest fault arising from an ignorance of this fact is the "returning" of a draw-off service on a tank apparatus. The draw-off service, of course, proceeds from the flow-pipe, and is carried back and connected into the return, and the effect is that the water does not lie stagnant, as it does in a single pipe, and the hot water is brought right up to the tap, or nearly so; everything is satisfactory up to this point, but immediately the tap is opened a partial failure manifests itself, for water will instantly proceed in equal quantities from both flow- and return-pipes, and as it is the exception rather than the rule for the return-pipe to be hot the water that issues from the tap will not always be of a satisfactory temperature, certainly not as hot as it might or should be. Should the whole apparatus be full of hot water so that the contents of the return-pipe are nearly as hot as the flow, then, of course, the water drawn off will be of a satisfactory heat, but even this satisfaction would be short lived, for the instant water commences to flow from the tap a corresponding volume of cold water enters the tank and quickly finds its way down the return-pipe.

An observance of this action of water proceeding from all directions to an open tap has led to the rising main of the cylinder system being returned and connected into the cylinder at a high point (as already explained), so that although the water makes its way up both pipes when a tap is turned on, yet as both proceed from the upper part of the cylinder no ill result whatever ensues. It was but a short time ago, and is very often now, the practice to return the rising main into the bottom of the cylinder or into the primary return, and many an apparatus has been cured of its inefficiency or been greatly improved by the mere alteration of this detail.

The discussion of this particular action may not strike everyone as being worthy of the importance that is being attached to it, but in practice it will be found that there is no effect which requires to be so continually under consideration when a problem in this work presents itself, and a knowledge of it is of the utmost value in a practical sense.

It should be mentioned that the question of the friction or resistance that water experiences in flowing through pipes has not been overlooked, but it makes such a trifling difference to this particular subject that it is scarcely worth consideration, yet, of course, if a tap were so situated that in one direction the water had only to flow a few feet, and in the other direction a hundred feet, a marked difference would be noted, but so great an inequality seldom occurs.

#### SURVEYORSHIPS.

WITCHINGTON. — The Withington Local Board (near Manchester) have increased the salary of their Surveyor, Mr. A. H. Mountain, from 200*l.* to 250*l.* per annum.

DIOCESAN SURVEYORSHIPS. — Mr. F. W. Waller, architect, of Gloucester, has been reappointed as Surveyor of Ecclesiastical Dilapidations in the Archdeaconries of Gloucester and Cirencester; and Mr. C. E. Ponting, of Lockeridge, Wilts., has been reappointed to a similar office in the Archdeaconry of Bristol.

#### GENERAL BUILDING NEWS.

RE-OPENING OF PETERBOROUGH CATHEDRAL. — After a restoration which has been in progress since the beginning of 1883, as chronicled and illustrated in our columns from time to time, Peterborough Cathedral was on Tuesday reopened. The work which has been done has been of a most extensive character. The great central tower was at the end of 1882 found to be in so insecure a state as to necessitate its being entirely taken down and rebuilt. This has been done, the tower being now rebuilt on solid foundations. In addition, the pillars of the choir and the north and south transept roofs have been repaired, and both transepts have been underpinned. These works, which were essentially necessary for the security of the fabric, have absorbed the greater portion of the expenditure. The other works which have been done include the cleaning of the internal masonry of the nave, aisles, and western transepts, the placing of a cement floor in the triforium, and new bell frames in the north-west tower. The total cost of these works has been 31,669*l.* 17*s.* 7*d.* The works on hand, or which have been provided for by special donations, consist of a choir pulpit, Bishop's throne, and marble floor for choir, extensive of risles and transept windows. The work has at present nothing to do with the funds in hand; but there are other works certified by the architect, Mr. Pearson, as urgently needed, which are estimated to cost 4,000*l.* The work in question consists in making good the masonry of the north and south transepts, and in underpinning and repairing the north-east angle of the choir. The work is also proposed, when funds are forthcoming, to complete the stalls with bookboards and seats, at a cost, with canopies, of 5,176*l.*, to re-arrange the east end of the choir, and to reconstruct the organ in another position.

MODEL DWELLINGS FOR ARTISANS, BIRMINGHAM. — At a meeting of the Improvement Committee of the Birmingham City Council on the 8th inst. the Clerk (Mr. A. E. Davis) reported that the model houses erected by the Corporation in Ryder-street had been completed and occupied. There are twenty-two houses, and they have been built at a cost of 4,000*l.* Messrs. Martin & Chamberlain, of Birmingham, being the architects, and Mr. John Wood, of Handsworth, the contractor. Each house consists of a sitting-room, scullery (fitted with boiler and other necessary conveniences), two bedrooms, and an attic. At the back there is a large asphalted yard for the use of all the tenants. Water is laid on.

THE ARTISANS' LABOURERS', AND GENERAL DWELLINGS COMPANY, LIMITED. — This company has resolved upon an important extension of its operations. Another extensive suburban estate has been secured for the purposes of the company. Although the attention of the board has for the last few years been chiefly directed towards block buildings in central London, the work of the company in the suburbs has not been left slight of, and the directors have acquired a large estate in Streatham-hill, a freehold estate of 66 acres, upon which it is proposed to build about 1,600 houses and shops of the same kind as those on its Shaftesbury Park, Queen's Park, and Noel Park estates.

NEW TECHNICAL SCHOOL, COATBRIDGE, N.B. — The foundation-stone of the Coatbridge Technical School was laid on Saturday, the 11th inst., by Sir Archibald Campbell, Bart., M.P. The new building will form a part of the Coatbridge School, the main entrance is from Kildonan-street. Internally the school embraces on the ground-floor three lecture-rooms, a mechanical laboratory, and a large mechanical and architectural drawing-room about 50 ft. by 33 ft. On the upper floor there are three large art-rooms for elementary and advanced art, including painting; also a chemical laboratory about 52 ft. by 32 ft. with chemical lecture-room and a preparation-room. The chemical laboratory when finished will be fitted up for sixty students doing practical work. There are also a sufficient number of refectory-rooms, lavatories, and other conveniences for such a building. The buildings are being ventilated by Robert Boyle & Son's patent system, and heated by hot water at low pressure. The whole buildings have been erected from plans by Mr. James Davidson, architect, Coatbridge, and the work is being carried out under his supervision.

NEW ROMAN CATHOLIC CHURCH FOR HULL. — On the 7th inst. the foundation-stone of the new Roman Catholic Church of St. Mary's, Wilton-street, Hull, was laid by the Bishop of Middlesbrough. The building has been designed in the Early English style of architecture, and is dedicated to the Sacred Heart and St. Joseph. The accommodation is for 500 adults, and the contract price is 3,500*l.* It is being carried out from designs of Messrs. Smith and Brodric and Mr. A. Lowther joint architects.

NEW WESLEYAN CHAPEL, SALTSAL. — On Tuesday last were laid the memorial stones of a new Wesleyan Chapel for Saltsal. The new chapel is to cost 3,500*l.* It will stand at the top of Fore-street, and will be about 12 paces long. It will also be a school-room on the ground-floor, and will have infant class-rooms on the first-floor. Mr. Finch, of Plymouth, is the contractor, and Mr. H. J. Snell, of Plymouth, the architect.

A NEW BOARD SCHOOL FOR BENWELL. — The foundation-stone has just been laid of a new Board School at Benwell, Northumberland. The rooms of the school are all on the ground-floor. The building is of stone, with slated roof, the insides of the roof being open timbered, stained, and varnished. The school is for boys and girls is 25 ft. by 25 ft. Connected with this school are five class-rooms 25 ft. by 24 ft., each capable of accommodating sixty children. There is also a cooking-room fitted up with the latest improvements. The infant school is 36 ft. by 22 ft., and connected with this are class-rooms, 24 ft. by 20 ft. The school has been erected by Mr. J. W. Thompson, architect, Newcastle, whose plans were selected in competition. The contract has been let to Messrs. T. & V. Common, of Horeley, for 4,630*l.*

A NEW HOSPITAL FOR BIRMINGHAM. — The Governors of the Birmingham Hospital have just decided to erect new buildings on a more convenient site, at a cost of considerably over 100,000*l.* The present buildings are antiquated and inconvenient.

SCHOOLS, CADBURY HEATH. — The designs of Messrs. W. S. Bernard, F.R.I.B.A., and R. L. Drake, of Bristol, have been selected in open competition for a new Board School for 300 children, to be erected at Cadbury Heath for the Oldland School Board.

#### SANITARY AND ENGINEERING NEWS.

TECHNICAL EDUCATION OF PLUMBERS. — BRIGHTON. At the Brighton Technical and Manual Instruction School, York-pole, an evening class of practical plumbers has just been opened. The instruction given will be in accordance with the syllabus of the City and Guilds of London Institute, examination in this subject including Mechanical and Chemistry allied to plumbers' work as required by the Institute. The practical teacher is a registered plumber under the Plumbers' Company.

THE MAYNARDS PIER. — The Maynards Pier, performed the ceremony on the 8th inst. of screwing the last of the 22,500 bolts in the ironwork of the St. Leonards pier.

HARBOUR IMPROVEMENT AT WEYMOUTH. — On the 9th inst., Mr. Alfred Dennis, the Mayor of Weymouth, laid the final stone of the new quay which has just been completed in connection with an important widening of the quay at a cost of about 12,000*l.*

DUFFIELD WATERWORKS. — At the request of the Belper Rural Sanitary Authority, Mr. W. J. Radford, C.E., of Nottingham, has sent in alternative schemes for waterworks at Duffield, and they are now under consideration. In one scheme Mr. Radford proposes to take the water from the Hazlewood spring, and store it in a service reservoir and supply by gravitation, any future deficiency being made good by putting down the pumping station mentioned below. In the alternative scheme Mr. Radford proposes to pump river water from the alluvial deposit, after natural filtration through sand and gravel, the water being pumped into a summit reservoir to command the district.

NEW PIER FOR BLACKPOOL. — It is proposed to construct a third pier at Blackpool, and a meeting was held on Monday night in furtherance of the scheme. The new structure will jut out from the promenade at the South Shore, and a special festival in connection with it will be a large pavilion for the entertainment of the public at the shore opposite to the pier. PROPOSED BIRMINGHAM AND LIVERPOOL CANAL. — A meeting was held on Tuesday of the Dudley Town Council and the Dudley Chamber of Commerce to consider the proposed Birmingham and Liverpool Ship Canal Scheme. To commence at Birmingham the canal, it was suggested, should pass through Black Country towns towards Wolverhampton. Mr. Beriah Shepherd, the originator of the scheme, addressed the meeting, giving details as to route, method, cost of working, &c. He said the canal was estimated to cost 2,500,000*l.*, without the land, which was 1,200 acres, and the work could be done within three years. After some discussion, a resolution was moved and unanimously carried, expressing approval of the scheme, and declaring it to be worthy of support.

#### FOREIGN AND COLONIAL.

FRANCE. — The works for the consolidation of the Pont Neuf, commenced in March last, are now completed. — The works have been commenced for the derivation of water for Paris from the source of the Arie, the Vigne and the Verneuil. The works comprise three distinct sections; first, the construction of a grand aqueduct in the department of the Eure and Loire; second, the carrying of the water through an iron aqueduct to follow the new railway line from Montlouis. The Ministry of Public Works has under consideration project for a bridge between the two hills of Croix Rousse and Fourvières at Lyons, crossing the Saône.



a height of 107 metres above the river. Lifts will be established on each bank to raise passengers to the hill level.—At the Columbar barracks at Amies a lead coffin has been discovered containing an embalmed body clad in monastic vestments. The barracks were built on the foundations of a 16th century monument to the memory of millo Desmoulins is to be erected at Guise.—Bourgeois, the Minister of Public Instruction, is proceeding to Macon to inaugurate the statue of Marianne in his native town. The ceremony is to take place on the 20th.—M. Mascart is about to install at the Eiffel Tower a bronze thread or pendulum 6 metres long, fishing 2 metres from the ground, and attached to the centre of the second platform, carries a steel sphere of 96 kilograms weight, and is intended to subserve some interesting scientific experiments.—The tower of the church of Saint des Brosses, in the Arrondissement of Forligner, has been struck by lightning, and the fall also injured the works of art and paintings in the sanctuary.—The death is announced, at Arras-sur-mer, of M. Léopold Dingen, architect of the Arrondissement of Abbeville, and former pupil of Lefuel. His career was a short but an honourable one, he obtained many premiums in public competitions and was a corresponding member of the Académie Centrale des Architectes.—The new Mairie at Gagny (Seine-et-Oise) has just been opened.

DRESDEN.—On the "Brühlsche Terrasse," and opposite to the New Ministry of Finance in course of erection, on the other side of the river, a block of buildings is being erected to contain the offices, and also the works of art and paintings in the Saxony. This very extensive block (the river out of which measures 170 metres) has been commenced under the superintendence of Professor Reuss, and will show Renaissance façades carried out in a good Saxon freestone.

BRAGUE.—The still remaining piers of the old bridge are being examined by order of the municipal authorities of the city. We hear at besides the piers dismantled during the recent floods two others, No. 5 and 8, will have to be entirely rebuilt, flaws having been found in their foundations. As the thorough repair of the old monument will take many years, a provisional wooden bridge is to be erected alongside the damaged one.

CHARLOTTENBURG. The first part of the extensive sewage system for this town, commenced 1887, and so far already costing 7,500,000 marks, or nearly 375,000*l.*, was opened on the 6th inst., an official ceremony taking place in honour of the occasion. Up to date, 30,000 metres length of mains and sewers have been laid; the largest sewer section measures 2.30 by 2.70 metres.

BEIRA.—According to a German contemporary, a German engineer, Herr Bethge, has been commissioned by the Siamese Government to construct a proposed Bangkok-Canal railroad, in spite of the English competition.

NORTH SEA AND BALTIC CANAL.—For those interested in canal-building, we take note of a map of the above canal which has been lately published by order of the authorities under the special peritendence of Reg. Baumeister Brennecke, and maps referring to ground, construction, &c., are appended. It is published by Patsch, of Berlin.

FRENCH EXHIBITION IN MOSCOW.—Between May and October next a French Industrial Exhibition is to take place in Moscow, but the idea is greatly opposed by native and German manufacturers in the city. The exhibition will be held in the buildings of the Moscow Exhibition of 1882.

THE TASHKENT INDUSTRIAL EXHIBITION.—An industrial exhibition is being held this season at Ashkand, in order to show the progress of industry in Central Asia. It has been a great success, having been visited by some 35,000 persons, including many visitors, who have been greatly impressed with a show.

SWEDEN.—During the summer, granite to the value of 6,000*l.* has been exported from the west coast of Sweden, chiefly to Germany.—Up to the present nearly 40,000*l.* have been expended in the restoration of the old Upsala Cathedral, and there still in hand 15,000*l.* The stained windows are being made in Sweden for the first time.—The old Castle of Gripsholm, near Stockholm, the most celebrated in Swedish history, is to be restored to its appearance about the year 1500, according to a plan of Herr Liljekvist, architect, which has been approved by King Oscar.

HAMBURG.—The railway station has just been completed, and was handed over for public use last week. The new station buildings, although below the present standard of the large modern stations, the empire as regards architectural merit, deserve mention on account of the clear and precise planning shown in them. Among the new buildings in Hamburg, which the above erections are intended in connection with the University; the noted group of hospital buildings and the new medical Institute deserve to be specially taken notice of; whilst of those belonging to other bodies a new Provincial Law Courts and the premises of a Mining Board ought not to be passed over. The important houses, that the above erections, taking a prominent position among the most modern ones in Germany, may be deemed the new theatre,

a model one of latest date, containing 1,200 seats, erected according to the designs and under the superintendence of Herr Selig, of Berlin, at a cost of 1,200,000 marks (the original estimate, by the way, was 400,000). Among the buildings at present in course of erection is a new lunatic asylum for university purposes, a municipal poor and workhouse of large dimensions, an archaeological museum, and a building for the newly-formed town fire-brigade. The horse tramway is to be turned into an electric one, the concession for this purpose having been given to a Berlin company.

MISCELLANEOUS.

BRADFORD HISTORICAL AND ANTIQUARIAN SOCIETY.—The annual meeting of the above society was held in the Alexandra Hotel, on Monday evening last. The chair was taken by the President, Mr. T. T. Empall, who called upon the Hon. Cor. Secretary, Mr. J. A. Clapham, to read the annual report. The society is in a very flourishing condition, numbering 224 members. The papers given during the winter session had been very valuable, and the excursions in the summer to various places of historical interest much enjoyed. The election of officers and council then took place. The following were elected officers and council of the society:—President, Mr. T. T. Empall; Vice Presidents, Messrs. John Lister, M.A., and Wm. Thackeray; Treasurer, Mr. Wm. Glossop; Editorial Secretary, Mr. Wm. Cadworth; Corresponding Secretary, Mr. J. A. Clapham; Librarian, Mr. Theo. Scofield; Council, Messrs. J. Bottomley, W. M. Brookes, C. A. Federer, Thos. Lord, Richard Poole, Wm. Suddards, and Butler Wood; Auditors, Messrs. Thos. Howard and J. W. Turner. Five new members were admitted. The study of architecture was strongly recommended, and it was said that Parker's "Introduction to the Study of Gothic Architecture" was a very valuable work published at a very reasonable price.

CABLE TRAMWAY IN NEW YORK.—New York is much behind most of the large American cities in its tramway system. Horse traction, with all its horrors and inconveniences, is the rule; but there is now to be a cable railway up Broadway, and work is, according to our American contemporary, *Engineering News*, to be begun at once, and a section of the line will be finished by the beginning of the winter. There is a feature in connexion with this enterprise which we commend to the notice of our own "local authorities." The street will be paved at the same time that the line is laid, and "all companies having mains in the streets will be required to put the same in order before the new pavement is laid." New York is notoriously the most ill-paved city in Christendom, and "all companies having mains in the streets" have hitherto seemed to work their wicked will unchecked by authorities of any kind whatsoever. If we are to gather that there is to be a new departure in this respect it will be a more welcome change than even that of substituting a steam-engine for the unhappy horses that now supply motive power for street line traction.

THE UNHOUSING AND HOUSING OF THE POOR.—Perhaps no sanitary measure is more desirable as such than the demolition of the London "rookeries." Tenanted for many years by the very poorest of our poor, haunted continually by filth, disease, and vice, their existence is a constant menace to more wholesome neighbourhoods, and the space they stand on constitutes their sole value. In spite of these facts, however, the work of renovation has been proceeding without much haste, for an evident reason. The housing of their inmates is a matter of concern, and occasionally also of some difficulty. The occupant of a slum cannot always find a more suitable home. Model buildings, often excellent in design, though let at the most moderate rents, are still too costly for his precarious means. The less pretentious tenements of an older type are occupied by others like himself, but often also by workmen of a better class, attracted either by a prospect of economy or a dislike to the model buildings. These latter, indeed, do not seem to be duly appreciated. Airy, clean, commodious, economical, they are still to some extent unpopular. According to Dr. Yarrow, medical officer of St. Luke's parish, skilled workmen do not appreciate the advantages of such homes. He mentions the case of two blocks, in each of which many sets of rooms are still vacant. Unless it depend upon an objection to the collective life of the flat system, we are at a loss to account for this apparent aversion. It is possible that local conditions may have exercised some influence, and it would be of interest to learn whether other buildings of like type are so thinly populated as those above mentioned. Meanwhile we may remark that their construction as a rule affords reliable guarantees for sound sanitary condition, a consideration which should never be disregarded. The housing of the poor will be a question of the time for many years to come, and it may well occupy the attention of divisional sanitary authorities.—*The Lancet.*

THE ENGLISH IRON TRADE.—The unsettled state of the English iron market has been further complicated by a partial cessation of all business, both buyers and sellers being much perplexed by the present abnormal conditions of the trade, and

consequently reluctant to operate to any large extent. There has been a decline in pig-iron prices, but the finished products display a steadiness which shows that there is a large reserve of work in hand, and that manufacturers believe in an early recovery of the crude iron market. Scotch warrants have gone down about 2s. 6d. per ton since the commencement of the blast-furnace strike, which appears to be farther off from settlement than last week. It is impossible to say what Scotch makers would sell such iron for as they happen to have yet in stock, for they still abstain from quoting. Although hematite iron has declined 2s. per ton on the week in the north-west, the stability of the market seems to be greater, makers continuing to book large parcels. The tinplate market keeps very strong, and a further advance is announced. Shipbuilders have been able to add to their order-books, and continue active, and engineers likewise find ample work.—*Iron.*

ARCHITECTURAL ASSOCIATION CONVERSAZIONE.—Messrs. W. Woollams & Co. ask us to notify the fact that the name of their firm should have been given in the list of firms contributing to the "Conversazione" as "W. Woollams & Co.," not "Woollams & Co." simply. This is not an idle correction, as it appears, rather curiously, that there is a firm of John Woollams & Co., also paper-stainers and in the same neighbourhood, and also descended from the founders of the original firm, now divided into two which have no business connexion with each other. The invitation to contribute to the "Conversazione" was delivered by mistake to Messrs. John Woollams & Co., who declined, and the Committee at first thought the refusal came from the firm of W. Woollams, whom they had intended to invite.

MODERNISING VENICE.—The modernising of Venice, says the *Weiner Bauindustriezeitung*, is proceeding apace. Canals are being filled in, and streets made instead, whilst the handsome, light gondolas are fast disappearing and replaced by steamers. Of late a large number of the magnificent ancient palaces, with the characteristic loggias, have been pulled down, and ugly barack-like structures with tasteless façades erected in their place. However, up to the present this "vandal campaign" against the old structures has been carried on without any settled plan, but if a proposal now before the corporation of the city be accepted, it is to be feared that the appearance of the famous town will be entirely changed. The plan suggests the pulling down of the old buildings *en masse* and the building of modern ones, as well as the filling-in of canals and the making of streets on a large scale.

AGRICULTURAL HALL.—The Fourth Printers', Stationers', and Kindred Traders' International Exhibition and Market is appointed to take place at the Royal Agricultural Hall, London, on March 16 to 30, 1891. Considering the number of type-setting machines and other wonderful inventions that have been introduced during the last eight years, this Exhibition should prove interesting.

FUEL GAS.—In the United States is being carried out the often proposed plan of having separate mains for the supply of fuel gas. It is needless to say that the ordinary illuminating gas is an unnecessarily costly product when used for heating purposes. The introduction of the cheaper fuel gas, with its higher calorific value, would cause a great revolution in domestic economy, both in the matter of cooking and heating in our homes, and application for power purposes in gas engines. The Boston (Massachusetts) Gas Light Company announce that after November 1 they will be in a position to supply to houses in certain streets a fuel gas with a calorific value of about 400 heat units per cubic foot, at 60 cents per 1,000*ft.* Chicago is still further in advance; for there, we are informed by an American technical journal, the Mutual Fuel Gas Company has established works with a capacity of over 2,000,000*ft.* per day. About forty-two miles of mains are owned or controlled by the Company, and 3,000 customers are on its books. The charge here is 50 cents per 1,000*ft.*, "with a probable discount to large consumers." Water-gas has for some time been used in the United States for calorific purposes, but these two enterprises seem a fresh departure, and may inaugurate quite a new era in the history of Gas Companies.

FLUSHING CISTERN DISINFECTOR.—We have had the opportunity of seeing in action, at the offices of the Sanitation Company, Limited, Victoria-street, Westminster, a working model of Taylor's patented contrivance for mingling liquid disinfectant with the water at each discharge of a cistern, or of a flushing cistern. The invention is a very simple one, consisting merely of an ordinary bottle of disinfecting fluid, fitted with a special but simple discharging arrangement in the form of a small glass siphon-tube inserted through the cork of the bottle. The bottle is placed neck downwards in the flushing-cistern, and by reason of the operation of certain natural laws a teaspoonful of the fluid is automatically discharged into every charge of flushing-water at the time it is used. There is no leakage of the fluid between the times of the using of the flushing-water. If flushing takes place twenty times a day there will be twenty discharges from the bottle, and if only one flushing then only one discharge. There are no mechanical details.



(Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; l.i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.







LONDON.—For alterations and repairs at the Ravensbourne Club and Institute, Lewisham Bridge, Lewisham. Mr. Albert L. Guy, architect and surveyor, 75, High-street, Lewisham. £270 R. Hoare. £200 Chas. Robson, Lewisham. £100 D. & R. Kennard. 183 Accepted.

LONDON.—For alterations and sanitary works at 45, Weymouth-street, W. Messrs. Hooketh & Stokes, architects. John Barker & Co. £655 0 0 J. B. & S. Dunn. £635 18 10

NUENATON.—For the construction of a screening-chamber and other work at the Sewage Works, Nuneaton, for the Local Board. Mr. J. S. Pickering, Surveyor, Town Hall, Nuneaton. £175 0 Evans. £234 10 0 W. Smith, Nuneaton. £175 0 Heathley Bros. 180 0 Accepted.

PENARTH.—For private street improvement works at Penarth for the Penarth Local Board. Mr. James Court, Surveyor, Local Board Offices, 1, Glebe-street, Penarth. £1,675 0 11 7 2 Messrs. James Allan. £1,675 0 11 7 2 Messrs. J. Parnell. £1,675 0 11 7 2 Messrs. J. Mackay. £1,675 0 11 7 2 Accepted.

RICKMANSWORTH.—For the erection of eight cottages, New-road, Cradley-green, Rickmansworth, for Mrs. Rebekah King. Mr. Robert Wilby, architect, 56, Long-street, Rickmansworth. £1,580 F. J. Wicks. £1,580 A. & B. Hanson. 1,583 Accepted.

SOUTHAMPTON.—For the erection of a house, shop, carriage-shed, &c., in Commercial-road, Forbury, Southampton, for Mr. J. Messrs. Lemon & Bizard, architects, Lansdowne-house, Castle-lane, Southampton. £271 13 0 Charles Will. £280 0 0 H. Stevens & Co. 35 0 0 Henry Cawle. £74 10 0 Morgan, Islard, & Mor. 909 0 0 John Hinton. 799 0 0 C. & S. 897 0 0 Southampton. 790 0 0 William Franklin. 890 17 0 John Humber. 779 0 0 J. W. & Co. 890 17 0 Accepted.

SYDENHAM.—For the erection of a pair of villa residences at Sydenham. Mr. Albert L. Guy, architect, 75, High-street, Lewisham. £2,033 T. Knight. £1,820 E. J. Farnell. £1,820 R. B. & S. 1,820 G. Hall. £1,820 D. & R. Kennard, Lewisham. 1,820 H. L. Holloway. 1,820 Accepted.

WARRINGHAM.—For the erection of stables for Mr. Worthington Church. Mr. Ernest H. Abbot, architect, & Warwick-court, High Holborn. £268 C. Oldridge & Sons. 496 0 Hunter & Bryant. £420 0 W. Harman. 496 0 A. Foster. 380 10 J. & J. Ward. 427 0 Accepted.

WHITBY.—For the construction of about three miles and a half of sewer at Whitby, Yorkshire, for the Wormal Union Rural Sanitary Authority. Mr. Chas. E. Bole, Engineer, 12, Harrington-street, Liverpool. £5,136 10 0 Holmes & King. £4,814 0 0 James Bush. 2,117 0 0 Wainman & Co. 2,117 0 0 Peter Baines. 5,103 8 0 H. Fotherby & Son. 5,103 8 0 John Wainley. 5,098 8 0 Jas. Young & Son. 5,098 8 0 Wm. Vaughan. 4,700 0 0 Sandbach, Cheshire. 4,700 0 0 Thomas & Morris. 4,700 0 0 J. Davenport & Co. 4,700 0 0 Sterling & Swain. 4,702 0 0 W. H. Blackley. 5,690 0 0 Lewis & Thomas. 4,702 0 0 Accepted.

WITTINGHAM.—For the sewerage, drainage, paving, &c., of Lane-down-street, Mablethorpe, Wittingham. £7 11 0 W. H. & Co. Local Board. Mr. A. H. Mountain, Surveyor, Town-hall, Wittingham, Mablethorpe. £251 15 0 W. Snape & Sons. £464 10 0 G. Clarke. 474 19 6 Wm. Clarke. 437 8 11 M. Naylor. 467 17 8 Wm. Mansfield, Addison. 467 17 8 Wittingham & Pockell. 465 19 9 On Murray's report. 465 19 9

Re French-street, Wokingham. Mr. James Bowles asks us to note that the sum of £1,350 for this work should have been £1,376, 15s. 6d., and £1,377 15s. 6d. The mistake was due to a clerical error on his own part.

A Correction.—In the lists of tenders for works at Titchmarsh court-road and Greenway buildings, the name of the architect was mis-spelled. The correct name is Mr. A. H. Burden, not Mr. Burden.

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# The Builder.

OL. LIX. No. 256.

SATURDAY, OCT. 25, 1890.

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The New Music-rooms, Harrow School.—Mr. E. S. Prior, M.A., Architect.....	Double-Page Ink-Photo.
Third Frowned Design for Hymer's College, Hull.—Messrs. Chorley & Cannon, Architects.....	Double-Page Photo-Litho.
Chimney-piece in the Mayor's Parlour, Old Town Hall, Leicester.—From a Drawing by Mr. Arthur Dale.....	Single-Page Photo-Litho.
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### Old Newcastle.

It is a curious kind of unintentional play upon words that the buildings and sites called "old" in this connexion are all more modern than the erection which originally gave rise to the name of "New Castle," which the city on the Tyne still bears. The new is the old now, and the buildings which we call old Newcastle were once new and comparatively gimcrack erections in comparison with the massive Norman building which frowned down upon them from the top of the hill. And now these too in their turn are old, while the most prominent object in the minds of most of those who pass by or through Newcastle-on-Tyne is the lofty double-storied bridge, with the railway above and the roadway below, which connects the two quarters of the town, and from the height of which the traveller in the nineteenth century steam-driven conveyance looks down on the river which is older than all, though a very different sort of stream now from what it was when the Norman soldier looked down from the heights of the New Castle, probably over wooded banks, climbing from the water-side, on a clear and freshly-flowing river. The sun still shines on Tyne stream, and on bright days gives a glimpse of splendour on the river and the wreathed smoke as the train passes over the bridge; but the glitter on the water is only a superficial glamour on a stream which has long lost its purity and become tainted with all kinds of offscourings. For all that, Newcastle is a picturesque place to the passer by, both in regard to appearance and association. The castle and the bridge seem to vie with each other as the representatives of two epochs of great building activity, the castle-building of the Norman race and the bridge-building of the modern engineer, and it is a remarkable testimony to the power of the ancient builders that after all these centuries the castle keep still stands as the predominant object amid the town which has grown up around it, its only rival being the high-level bridge. Whether the bridge will last as long as the castle has lasted may be questioned.

Next to the castle and the bridge, St. Nicholas Church, with its picturesque and unusual lantern, is one of the notable structures of the town; and it is with these three buildings that its name is chiefly connected by the architectural traveller, and perhaps by most others. But there is a great deal more of picturesque and historical interest, hidden from the casual visitor in some out-of-the-way portions of the town; enough to furnish matter for a goodly and most interesting quarto volume of records and illustrations.\* It is true that Mr. Boyle does not by any means



Fig. 1.

pretend to present his readers here with a history of Newcastle; such a history, he observes, in any finally satisfactory way, is yet unwritten, and its writer probably unborn. But the book is full of curious information on the past records of the town, which, while interesting the reader of the present generation, may help to prepare the way for the future more complete history, the possibility of which is pointed to. The illustrative portion, we learn from the artist's preface,

\* "Vestiges of Old Newcastle and Gateshead." Illustrated by W. H. Knowles, architect; text by T. R. Boyle, F.S.A. Newcastle; Andrew Reid Sons & Co.: London, Elliot Stock.

originated in the possession of a number of sketches, made during leisure hours many years ago, and not intended for publication. The drawings necessary to complete the series have been made in spare moments of professional labour, and under these circumstances are highly creditable to their author. They serve to convey an idea of the number of interesting old buildings and street houses existing in Newcastle, and may prove valuable also as records when the originals have been removed. Some of the buildings depicted, we are told, have already disappeared.

All towns which lie partially on steep declivities contain in that very fact the elements of picturesque effect in street architecture; and the first thing the author has to speak about is accordingly "The Side," a name which in itself carries one back to the formation of the town, for "the side" was originally the side of the hill on which the castle stands. No one would think of coining such a name now for a single street among a congeries of streets; but when the name arose no doubt "the side" was the one street that straggled up the side of the hill. "The Head of the Side" disappeared when the high-level bridge was made, as other old and quaint corners will ere long disappear under the march of improvement; but the lower portions of The Side still contain various quaint and picturesque old houses, one of which is figured in our first cut, slightly reduced from the vignette to the book. The lower part of the street, the Foot of the Side, is shown in another drawing, and contains some of the same curious corbelled out-houses, with their picturesquely grouped large windows with small panes. The higher part of The Side is steep and narrow, though we are told nearly so narrow as formerly; and as this was the fashion of constructing the houses, it is not surprising that the upper stories nearly met in the middle; picturesque, no doubt, but, like too many other picturesque things, sadly at variance with the conditions of healthy life. Indeed, one can hardly imagine a more dingy existence than must have been led by those who kept shops at the base of these toppling piles of houses, shutting out all the light and air. Other equally picturesque bits of street architecture are figured in the plates, one of the best being Cosyn's House on Quayside, in which the heavy projecting square bay is carried on columns standing free on each side



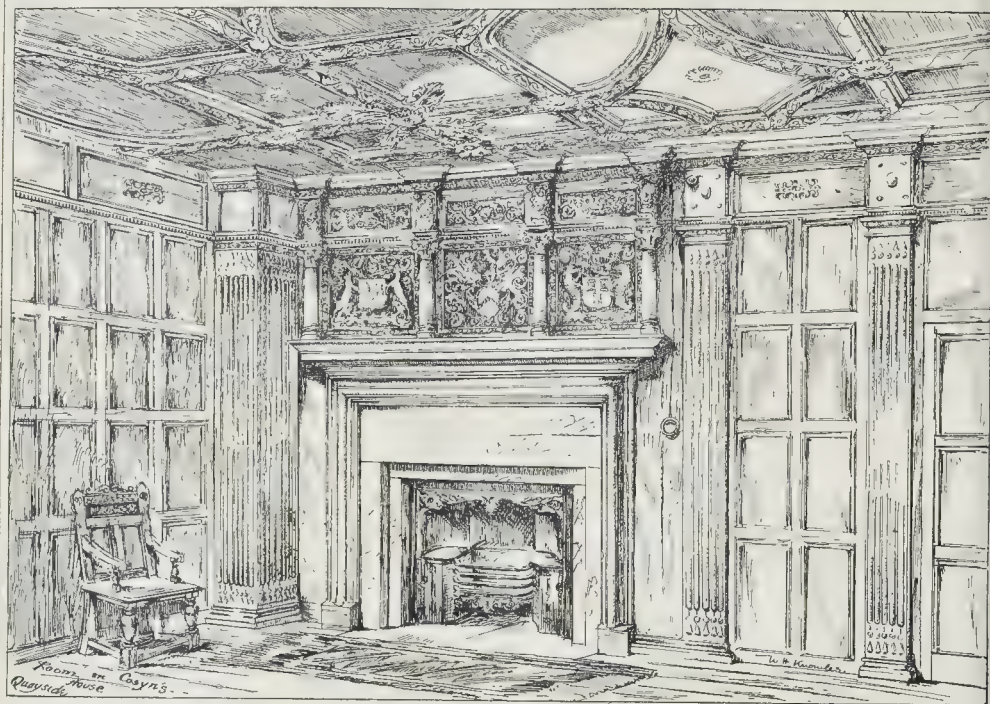


Fig. 2.

of the entrance, and connected with the door-jambs by a low balustrade on each side. The support given to the superstructure is probably rather apparent than real, the columns being merely ornaments; but the whole "bit" is one of the most piquant and sketchable incidents of old-town architecture that could be found. Other picturesque bits of building are taken sometimes from back courts and alleys, others from irregular groups of houses by the river side. In the older examples we find constantly that method of treating the windows in continuous horizontal bands or rows, the picturesque effect of which has been re-discovered by some architects of the present day. In the curiously plain and prim building called the Keelmen's Hospital, with its little clock-tower in the middle, dating from about 1700, we can study the opposite effect produced by very small windows dotted along a plain expanse of wall.

What is to be found inside of Cosyn's house is shown in our second cut, reduced direct from Mr. Knowles's original drawing. This is on the Quayside, once protected by a fortified wall, part of which was first removed in 1763, as being "a very great obstacle to carriages, and a hindrance to the despatch of business," as it no doubt must have been. The precise date of the house is not given. The room illustrated, the only one which retains its old aspect, and which is stated to be "the most charming old room in Newcastle," may have been fitted up subsequently to the erection of the front, which, picturesque as it is, gives no token of such richness within; and indeed we should be strongly inclined to suggest that the columns and balustrades flanking the entrance door, before mentioned, were not part of the original house, but added under the corbelling to give greater importance to the entrance, perhaps by Cosyn himself, who inhabited the house during part of his life, and died in 1661. The carved work over the fire-place of the room is very rich and bold in

design; of the three panels, the middle one bears the arms of Cosyn, the left-hand one that of the Drapers' Company of which he was a member, and the right-hand one the arms of the town. This decoration certainly also suggests the idea that the room was fitted up by Cosyn in accordance with his own taste and wealth. He was apparently a man of some power and influence in his day, so much so as to have had an information laid against him in Parliament as a political offender who was "endeavouring to bring the Scots into this nation." He left the town one hundred volumes of books, to be taken out of his library, sixty folios and forty quartos, and various charitable bequests in money.

Among the churches illustrated and described are St. Nicholas (which is now called the cathedral); St. John's; St. Mary's, Gateshead; St. Andrew's, and All-Saints'. The cathedral, though as it stands mostly of rather late date, is a church of some interest independently of its well-known lantern. This latter, it appears, has not been always an object of admiration, having been alluded to in contumelious terms by one Dibdin, an ancient chronicler, besides incurring the more serious visitation of the displeasure of Mr. E. A. Freeman, who speaks of it as a "strange anomaly," and adds, "the beauty or propriety of such a grotesque arrangement it is indeed hard to understand"; a criticism very characteristic of an amateur critic who judges Medieval architecture by its conformity to an orthodox type. On the other hand we cannot see in it "weird grandeur," which, *pace* Mr. Boyle, is also a very amateurish expression and a great deal too large for the occasion; but we concur in considering that Newcastle lantern is a very admirable and withal graceful piece of work both in regard to design and construction. Whether Rickman is right as to its having given the original suggestion for St. Giles', Edinburgh, the College Tower at Aberdeen, and St. Dunstan's-in-the-East, London, may

be matter of opinion; in regard to the latter suggestion, we should be much more disposed to see Wren's imitation of it in the lantern of Bow steeple, a kind of translation of the Newcastle lantern from Gothic into Classic. A thin and wiry imitation of it in a Batty Langley sort of Gothic was also produced, we know not precisely at what date, in one of the original parish churches of Liverpool, also dedicated to St. Nicholas. Mr. Boyle states that "no part of the church founded early in the twelfth century exists now. Such fragments of Norman work as I have seen are of late date, and cannot be ascribed to a period earlier than the year 1150." Then what does he call the small crypt, figured on page 107, with its segmental barrel vault ("elliptical" the author calls it, but it was never deliberately set out as elliptical) carried by flat transverse groins. We have not seen this crypt, and cannot say how far the sketch accurately represents the details; but it is very unlike a late Gothic crypt, and very like the Early Norman one at Christ Church, except that there the flat groins are rounded off and not chamfered. The circular traceried window at the end might of course be a later insertion. On the face of the illustration given we do not feel at all clear about this crypt. Nor is it made quite clear how much of the present exterior represents the ancient design, except that it is remarked that the present traceried windows are taken as probably following the lines of the old tracery. The church was restored in 1873 "at a cost of 21,400*l.*," a very formidable charge of restoration powder, and it would be interesting to know what it brought down. An engraving by Hollar of the church in his time is reproduced, with the south transept window represented with a circular or segmental head. In Mr. Knowles's drawing of the south transept and tower the window is a pointed arch, Medieval one; is this a restoration, or was the round-headed window in the old print only one of Hollar's little eccentricities, like



the enormous projecting buttresses, which most certainly never existed?

The interior of it is spacious in effect, but weak in detail. Some of the monuments are really curious and characteristic, notably the Sadison monument, a picturesque Renaissance erection carried on a base with great sculptured leaves and scrolls, a kind of rude reminiscence of a Corinthian capital, bold enough in its way, but completely out of keeping with the scale of the other details.\* St. Mary's Church, Gateshead, with an ancient history, has little of architectural interest left now. It possesses however some characteristic carved bench ends and a very fine Renaissance chair. We give the illustration of the interesting communion-cup and



Fig. 3.

cover, with its decoration formed by the arms of the donor engraved on the plain metal; effective artistically, but how out of place and how curiously at variance with the Medieval (we may say also with the modern) feeling as to the sacred rite. The cup is inscribed also, "The free gift of James Cole to St. Marijes Church in the parish of Gateshead." This last bit of spelling points to what the author suggests as the undoubted origin of the name of "Gateshead," from the monastery "Ad Caprea Caput." "At the head of the Goat," referred to several times in old documents which are quoted. One would have thought "Gateshead" a name so naturally arising out of topography, the head of the gate or entrance-street, as to need no further investigation; but when we find in a Latin chronicle the sentence "in loco ubi dicitur Gotesheved, id est, ad Caput Capreae," it seems impossible to doubt this curious derivation.

St. John's is a Gothic church of interest in a quiet way. All-Saints was originally a Medieval church of apparently some interest and importance, which in the eighteenth century had become very ruinous, and the reports of three architects were called in as to its state, one of whom contemplated the repair of the ancient building, while two others counselled its entire removal, and the building of a new church. Their advice prevailed, though we are told that when it was actually taken down, "the firm manner in which several parts of the tower were cemented, rendered it necessary to have recourse to the operation of blasting with gunpowder." We have heard something like that in more recent times. All-Saints now stands as the Renaissance church of the town, of which it is not a bad example in its way; it was completed in 1796, at a cost of about

\* It may be worth while to mention in passing that a new literary interest attaches to the old Newcastle church since the publication of Browning's "Parleyings with certain People"; one of the "certain people" being Avison, once organist of the church in the early days of music, and who appears to have been a kind of reformer in music in his day, and wrote essays inculcating what were then thought very "advanced views" on the art. His name is found occasionally in old collections of music, but was forgotten till Browning resuscitated him as

"Thou, whilom of Newcastle organist."

Mr. Boyle, who indulges much in old social and artistic records, seems to know nothing of Avison.



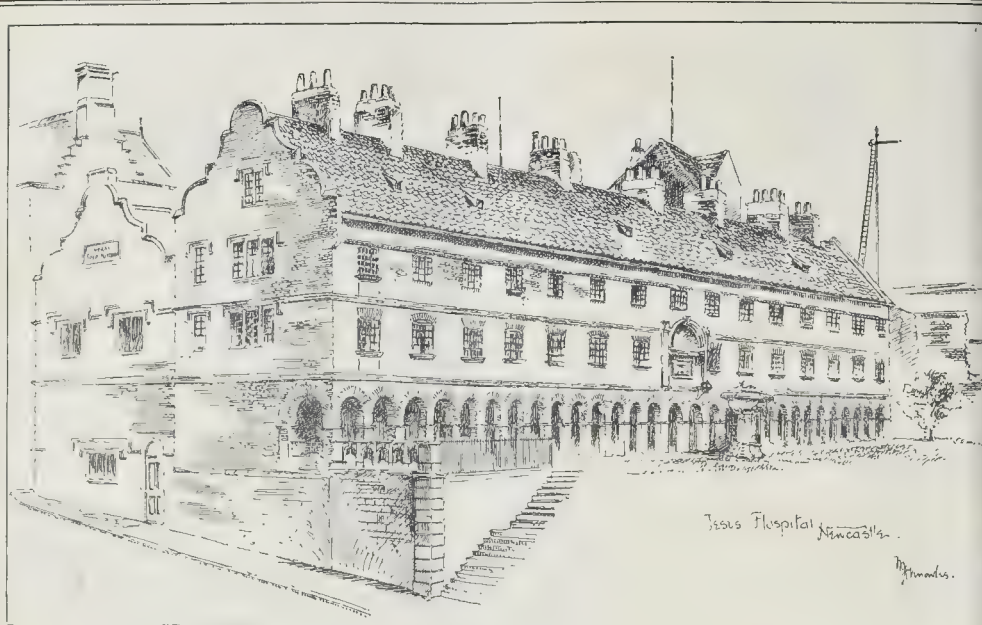
Fig. 4.

27,000*l*. One of the most characteristic bits of church architecture which is given in the volume, next to the Cathedral lantern, is however the massively buttressed old tower of St. Andrews, of which we give a reproduction from the author's drawing; there is not much of architecture about it in one sense, but it is a kind of thing every artist would feel irresistibly impelled to stop and sketch.

St. Mary's Chapel, Jesmond (*quasi* "Jesus' Mount") appears to be a very interesting relic of Transitional work. But some of the secular buildings of more modern days are apparently as interesting and characteristic as any of the Medieval work, perhaps more so. Among those figured and described in the volume none is of more interest than the Jesus Hospital, founded and endowed by the Corporation of Newcastle in 1681. Of its simple but truly architectural front with its arched loggia on the ground story, we give an illustration from Mr. Knowles's drawing. There is a lesson to be learned from this as to the really dignified effect to be obtained by this simple and broad treatment of a long building with regular lines of windows. It is of course the arcade which really makes the building, architecturally; without that it would be nothing; but that avails to give it architectural character and interest without any further enrichment of ornament or detail. In this respect it reminds one

of Queen's College quadrangle at Cambridge, with its plain brick arcade. There is a good balustraded staircase with a heraldic lion on one of the newels, and a sea horse on another, of which a drawing is given. A more detailed sketch of a portion of the front, given on another page, increases one's respect for it as an excellent example of the architecture of its date. It is a pleasure to come across a building so totally unaffected in style, and in which the architectural effect arises so naturally out of the conditions of the building.

We have purposely avoided touching on the Castle, which is fairly well illustrated in the book, but which is a subject rather for a separate monograph in itself, and at all events can merely be alluded to in a short article. Besides, it is a well-known monument, while we have thought it more to the point to draw attention to the information and illustration given in the book in regard to less known buildings of Newcastle, as indicating how much more there is to see there than the passing visitor probably imagines. We have really said little or nothing as to the fund of curious historical information to be found in the volume, in regard to the former social and municipal history of the city; but we can assure those who wish to know more of this that they will find Mr. Boyle's pages full of interesting and amusing reading; and probably most architects who see the sketches of



*Fig. 5.*

the old streets and corners will be disposed to arrange to give a little time to Newcastle-on-Tyne when next they go that way.

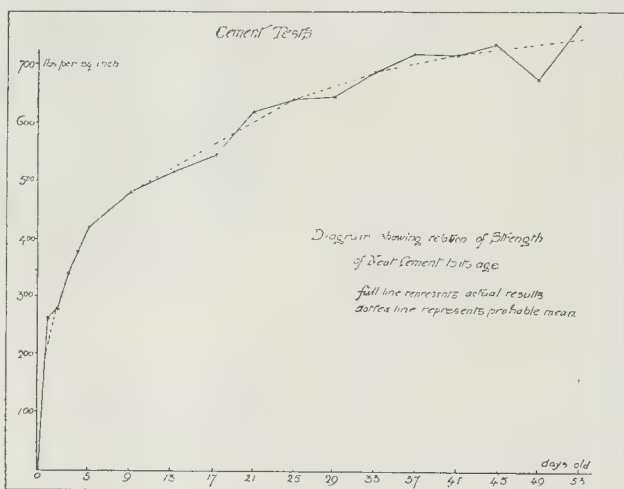
## CEMENT TESTS.

BY PROFESSOR T. HUDSON BEARE.

**T**HE tests, the results of which are given in this article, were made by the author in his engineering laboratory, University College, London. They were made chiefly with the object of ascertaining if the method of gauging the briquettes by dry pressure, and then allowing them to suck up water for a given time, gave more reliable and trustworthy results than ordinary hand-gauging, and also to determine the rate of gain of strength of such briquettes with age.

This method, devised by Mr. Arnold, is as follows:—The moulds are of the ordinary form and cross-section, but for briquettes, which, when finished, are to be 1 in. thick, they are 2 in. deep; the moulds are placed on a stout, flat tray, with a shallow rim all round it, and are filled with dry cement, a weighed quantity (0·3 lb.) being placed in each; a brass die the exact shape and size of a finished briquette is then placed on the top of the cement in each mould, compressing the contents; this compression is completed under a small hand screw press, and the dry cement is so compacted that it occupies only half of the mould; the die is then flush with the top. We have thus a briquette of exceedingly closely-compacted dry cement exactly 1 in. thick; water is then poured into the tray, and the cement absorbs this by capillary attraction,—this goes on for twenty minutes; the briquettes are then removed from the tray and placed on a table, die down, to set for twenty-four hours. The after-procedure is precisely the same as in the ordinary methods; the briquettes are taken out of the moulds at the end of the above twenty-four hours, and at once placed in water, where they are left for the intended time, then taken out, and immediately tested.

Since in this method it is rather difficult, owing, perhaps, to a slight recovery of the die on releasing from the press, to insure that the briquettes are exactly one square inch in



section, they were all measured; the areas, however, varied but little from the inch, the smallest being 0.96, and the biggest 1.04 square inches. In all cases, however, the total breaking load was corrected for the real area.

The machine used in the tests was made by Kuhlman; it is the standard German form, an ordinary double-lever one with a leverage of 10 to 1. It is an excellent little machine for use. There was no automatic arrangement, the shot being poured by hand. Extreme care was taken to keep the flow constant. The rate was about 400 lbs. a minute on the test piece, so that the weaker specimens were broken in about a minute, the stronger in one minute and a-half. For these the initial loads were 5 lbs., 5 e., 250 lbs. on square inch, against only 1 lb., or 50 lbs. per square inch, for the weaker ones.

The briquettes were all in fracture exceedingly compact and close grained. This

is a result of the fact, that while an ordinary hand-gauged out of this size contains about 0.26 cu. pound of cement, these had 0.3 of a pound, or about 15 per cent. more; and compactness must, therefore, have been much greater than in the ordinary method. They were all made from one barrel of cement (supplied to the author by the London Portland Cement Company) kept carefully dry when not in use. The experiments lasted, over a period of three months; it is quite certain, however, that the cement was just as good at the end as at the start. It was originally intended to have three briquettes in each set, but it was afterwards decided to have five. The first set was tested immediately after removal from the mould, the second after one day in water, the third after two days, the fourth after three days, the fifth after four days, and then each succeeding set was four days longer in the water than the one before. In a few instances,



## NOTES.

**A**T the meeting of the Hellenic Society on Monday last some interest was excited by the paper read by Mr. A. H. Smith as to the subject of the sculpture on the well-known drum of one of the columns of the temple at Ephesus, which forms the most precious of the late Mr. Wood's excavated treasures, and of which the first published illustration was given in this journal shortly after its discovery. The accompanying small



cut of the principal portion of the sculpture, reduced from a diagram handed round at the meeting, will serve to explain the point of the paper. The sculpture has been accepted as representing the release of Alcestis from Hades, the central female figure being Alcestis, that on the left Thanatos (Death) and that on the right Hermes, about whom at all events there is no doubt. Some traces of a figure on the left (not shown in the cut) are supposed to indicate Herakles, who conquered Death and brought back Alcestis. This theory does not account for the action of the female figure on the right, with something like a necklace in her hands. Mr. Smith's theory is that it is the birth of Pandora, who was decked with gifts by the gods, and conducted to earth by Eros and Hermes, and he gave an unpublished archaic scene from a vase-painting in which Pandora formed the central figure, and a wreath is being offered to her, while other figures stand round on either side. The objection at once to this theory, however ingenious, is that the central figure is not stationary or in receipt of gifts, but moving away to the left. The theory partially explains the action of the other female figure, but that is all it has to go upon; the rest of the figures seem quite at variance with it. The Alcestis theory is much more nearly in keeping with the general aspect and action of the group, though it does not explain either the necklace in the hands of Persephone (as the other female must be in that case), or the peculiar sad and languid expression of Hermes, with head thrown back and parted lips, which is what probably most strikes every one who looks at the sculpture. Still, we think Alcestis is the best suggestion that has been made. On the same occasion, Mr. Theodore Bent gave a very interesting account of his recent explorations in Cilicia, a locality which seems to promise fresh pastures for the architectural archaeologist.

**W**E published on October 11 a letter from Mr. Penrose asking for subscriptions towards the cost of getting drawings and records made of the remains of the Byzantine buildings destroyed by fire at Salonika, before they were "restored" so as to obliterate their original history, as seems likely to be the case. The following letter from Mr. Penrose shows that his appeal has met with a liberal response from one reader at least, and we publish it here *pour encourager les autres* :—

"Sir.—The letter you were so good as to publish, inviting subscriptions in aid of the work of the British Archaeological School at Athens in the examination of the ruins caused by the recent fire at

strong one of set 1, and the very weak one of set 2, the grand mean is 551, very close indeed to 549.

§ Eliminating a very weak one, the other four being very regular; this mean would be 671 lbs.

¶ One in each set rejected because of flaws.

\* No explanation can be given of this anomaly; two were gauged at one time, three at a later time; the results are all fairly uniform one with another, and were carefully checked.

\*\* Only four were made in this set.

Salonika, has already produced one most encouraging response in a subscription, which heads the list with 20*l*., received from Miss A. F. Yule.

It is hoped that it will be well followed up, as a report from our students who have gone to Salonika shows that it will demand several months' hard work to do justice to the occasion.—Your obedient servant,  
F. C. PENROSE.  
63, St. Paul's-churchyard."

We shall be glad to announce in our columns the receipt of any further subscriptions for the same object.

**O**N the afternoon of Friday, the 17th, a large gathering of archaeologists, artists, and classical scholars met to celebrate the opening of the New Cast Museum at Oxford. There was no formal ceremony, but the guests invited to meet the Vice-Chancellor were received at the galleries by the Curators. Among those present were Sir Charles Newton, Mr. W. Richmond, Sir Frederick Pollock; and Cambridge was represented by Professor Middleton and Dr. C. Waldstein. The Oxford Museum naturally suggests comparison with Cambridge, and must inevitably, to some extent, suffer by such comparison. Cambridge erected a building specially for the purpose of housing its casts, and expended on it 9,740*l*. Oxford had little more than 4,000*l*. with which to provide casts and books and other apparatus of archaeology, together with new rooms for their accommodation. It was further hampered by the possession of a large number of indifferent and cumbersome casts, not only of second-rate Roman statues but of modern benefactors. In compensation it had, however, a rich treasure of inscribed marbles. The inscription room is, indeed, a notable feature in the new arrangement; the room is in the basement, but admirably lighted, and the inscribed slabs are well set up on a level with the eye, not, as too frequently, lying on the floor where they can only be examined in a painfully prone position. The collection of casts,—a large one,—is amply supplemented by drawings, photographs, and plates. The illustrations of such works as the Monumenti, Gerhard's Vase publications, and Brunn's collection of photographs, are exposed on screens in a profusion almost perplexing to the eye. Certainly Professor Gardner,—to whom, as Lincoln and Merton Professor of Classical Archaeology, the arrangement is largely due,—has every reason to say that "the notion which seems in some quarters to prevail that archaeology can only be learned at Berlin or Athens, is quite unjustified." The bulk of the German archaeologists enjoy, in their preliminary training, no greater material advantages than those which are now available at Oxford.

**R**EADERS of the *Builder* who may be planning a winter's journey to Rome or Athens may be interested to know in advance the official programme for the public meetings, lectures, &c., of the German Archaeological Institute at both places. Dr. Petersen, the head of the Roman Institute, will, besides conducting the regular meetings, hold from December 9 to April 21 a series of classes in the various Roman Museums, for demonstration and for archaeological practice in the examination of monuments. The sub-secretary, Dr. Hülsen, will give three times a week, from November 15 to December 20, demonstrations *in situ* on Roman topography, and, if the course is well supported, he will repeat it in April and May of the following spring. Besides this, he will hold practice classes in epigraphy from January till the beginning of April. In the summer Herr Mau will give an eight days' course of lectures at Pompeii.

**A**T Athens the fortnightly meetings of the Institute will begin on December 10, and continue as usual till Easter. During the same period Dr. Dörpfeld will give his usual *in situ* demonstrations on the buildings and topography of Athens, adding Peiræus and Eleusis. The second secretary, Herr

where a briquette was a good deal weaker or stronger than the average of the set, a fresh series of five were made; in the table, however, all the results are given; it was only necessary to discard two out of the 114 made, in both cases because some impurity had got mixed up in the dry cement in gauging them. The table gives the mean of each set, and the range of strength above and below the mean, the notes appended to it explaining any peculiarities. A diagram showing the results graphically is also given; from this it is quite clear that the rate of increase beyond fifty-two days would be small. A curve approximating closely to the actual results is also shown.

In conclusion, the author would like to draw attention to the necessity of engineers and architects adopting some standard tests for cement, as is done in Germany. It is a much more difficult matter to secure satisfactory tests of cement than of such materials as iron and steel; there are so many things likely to affect the results. There is always a certain amount of uncertainty in briquettes gauged by hand, the personal equation of the operator becomes so important; if, therefore, some such apparatus as the one used in the above were adopted, one element of uncertainty would be eliminated. It is not denied that a clever manipulator might, over a series of experiments like this, obtain results quite as uniform, but the chances are against it. Then, too, a standard rate of test should be adopted, and also the number of briquettes needed for a test. At the same time, the other tests, such as fineness and weight, might also be standardised. It seems hopeless to expect a general agreement about ordinary iron and steel tests, but surely it would be an easy matter to come to an agreement in the case of cement.

It is certain that this form of gauging gives higher results with neat cement than hand-gauging, so that a new minimum strength would need to be fixed. This could easily be done by a series of comparative tests with the same qualities of cements, gauged by hand and by pressure. This question of standard tests has been frequently urged by Mr. Grant, Mr. Fajie, and many others.

T. H. B.

TABLE SHOWING STRENGTHS AND AGES OF CEMENT BRIQUETTES.

Number of briquettes in set.	Number of days setting in water.	Breaking load in lbs. per square inch.	Departure from mean values in set.	
			Over mean. per cent.	Under mean. per cent.
5	0	267	18.3	18.3
5	1	281	18.5	14.6
5	2	342	19.0	19.6
5	3	384	7.3	6.3
10	4	422	16.1	6.6*
20	8	484	14.6	16.4†
5	12	519	5.8	4.1
15	16	549	22.0	24.0‡
5	20	624	7.0	7.4
5	24	645	6.0	4.0
5	28	650	5.7	13.7§
5	32	694	10.1	7.1
5	36	725	5.5	4.0
4	40	723	10.2	6.4
4	44	742	5.3	6.3
5	48	684¶	5.1	6.6
4**	52	773	9.5	7.0

\* Mean of first set, 438; of second set, 405 lbs. second set extremely regular; first varied 11.9 per cent. above, and 10 per cent. below mean.

† Mean of first set, 480; of second, 450; of third, 496; of fourth, 511; the variations were respectively, 17.1 per cent. above; 15.6 per cent. below; 29.0 per cent. above; 13.1 per cent. below; 8.9 per cent. above; 12.1 per cent. below; 7.9 per cent. above; 3.7 per cent. below. The strongest was thus much the most uniform, while the weakest set had the strongest (567 lbs.), and the weakest (301 lbs.) briquettes.

‡ Mean of first set, 622; of second, 536; of third, 500 lbs. Variations: 11.2 per cent. above; 24.4 per cent. below; 13.4 per cent. above; 10.4 per cent. below; 19.8 per cent. above; 17.1 per cent. below. The sets were thus all irregular; but eliminating the very



Wolters, will give practice classes in the examination of antiquities in the museum at Athens. In the month of April, an expedition through the Peloponnese will be organised under the personal supervision of Dr. Dörpfeld, and a further journey, which will surely attract many students, for the examination of the sites of Pergamos, Troy, and some other places to be fixed later.

WE have received a circular from the Secretary of the National Society for the Exemption of Machinery from Rating (why, by the way, are secretaries so enamoured of the much-misused word "National"?), the object of which is to answer an attack made on the Society by the Guardians of the Chard Union in reference to the rateability of some machinery in their district. We cannot say much for the logical character of this circular; a considerable part is taken up with an extract from a consular report as to the effect of the bounty system on French ship-building, which is what lawyers call very irrelevant to the main issue. But it is obvious, from the tenor of the circular and from the way in which an Austro-Hungarian law exempting factories from taxation for fifteen years is cited with approval, that the practical object of the Society is to obtain the exemption of factories from taxation. It is obvious that the valuable and really rateable element in factories is the machinery. The rateable value of a factory without machinery is comparatively small. We then naturally ask ourselves, Are British manufacturers poor struggling men who require relief from taxation? On the contrary, the manufacturers are one of the richest classes in the community, and factory hands are some of the best paid artisans in the kingdom. That being so, why should an alteration be made in the existing law? From a business point of view manufacturers do well to try and obtain the exemption of machinery from rateability, but we do not anticipate success for the effort. That local authorities are inclined to make more out of factories and railways than is perfectly just is, no doubt, in some cases the fact, and an association to assist them in prosecuting rating appeals is legitimate enough. We cannot, however, agree with the views of the "National" Society above-mentioned.

WE hear that at the last sitting of the Prussian Royal Academy the majority of the members were in favour of not holding the usual annual exhibition next year, on account of the severe competition against it by the new Munich institution, which has attracted most of the best artists, and leaves but an insignificant show of North German work for the capital. It is certainly high time that Germany should have its one annual Salon, like other nations, instead of the competition of several exhibitions in different cities (Düsseldorf, Berlin, Munich), and that this Salon should be a recognised institution. Although it may be considered a pity that Berlin should have to give way to the Bavarian capital on such a point, this is only natural, considering, firstly, that Munich is the art centre of the Empire; and secondly, that the Berlin Exhibition has of late years been badly managed, remarkable more for the quantity than quality of pictures hung, and mostly held at the worst time of the year, when all Berlin is out of town.

AMONG the important statutes passed last session, and which are now printed, one of the first is the Companies Winding-up Act, 1890. The provisions of this Act are of too technical a character to be referred to at length. We may point out, however, that where "the capital of a company paid up or credited as paid up does not exceed ten thousand pounds, and the registered office of the company is situate within the jurisdiction of a County-court," it may be wound-up in such County-court. This will save a good deal of trouble and expense in the case of small industrial and similar companies, more

especially in the North of England, where small companies are more numerous than in the South. There is also a noticeable section, of which the substance is thus stated in the marginal note, "power of Court to assess damages against delinquent directors, officers, and promoters." The sums so obtained are to go to the assets of the company. While the provision is likely to make officials more careful, it is possible that it may be used by irritated but not very prudent shareholders as an engine to punish directors who have been unfortunate rather than wrong in their management. It is evidence, however, of the popular feeling against many of the existing malpractices of those who have charge of limited companies.

THE Bath stone firms have asked our attention to a method of chemically treating Bath stone for preservation against weather, by the exterior application of a liquid entitled "Fluate," which it is claimed renders the stone practically imperishable without altering its colour. At our request they have sent us two cubes of the stone, one in its natural state the other treated with "Fluate." The latter does affect the colour, giving the stone a light grey tint darker than its natural tint; but as the whiteness of new Bath stone is rather a defect as regards architectural appearance, the dulling of the colour is not a matter of consequence. The result of an examination of the Fluated stone is satisfactory, if it does not promise quite the imperishable quality that is expected from it. The two cubes were analysed first as to general composition; the following is the result, No. 2 being the Fluated specimen:—

	No. 1.	No. 2 F.
Water (lost at 212 deg. F.) ...	14	28
Loss on ignition .....	1.60	1.88
Oxide of iron .....	79	84
Alumina .....	26	31
Lime .....	55.13	54.34
Magnesia .....	36	55
Potash and soda .....	47	60
Carbonic acid, &c. ....	40.72	40.68
Sulphuric acid .....	trace	trace
Chlorine .....	03	03
Silica .....	50	49
	100.00	100.00
Alkalinity of the ground stone .....	012	017
" " outside surface .....	012	031

The analytical results do not present much difference, showing that the general composition of the whole blocks has not been much affected by the surface application of the solution, which does not appear to have penetrated more than one-sixteenth of an inch, but has undoubtedly hardened the surface very much, and rendered it much less liable to the effects of acid corrosion or of atmospheric action through frost. The following are results of special tests for acid and frosts:—

Ratio of solubility in a 1 per cent. solution of muriatic acid:—	
No. 1 Stone = .....	1.00
No. 2 Stone (Fluated) = .....	.89
Ratio of solubility in a solution of (1 in 1,000) muriatic acid:—	
No. 1 Stone = .....	1.00
No. 2 Stone (Fluated) = .....	.73
Loss of weight by artificial frosting in three days:—	
No. 1 Stone = .....	.56
No. 2 Stone (Fluated) = .....	.16
Ratio as 100 to 28.	

The action of the acid on the natural stone is the same over the whole surface, whereas in the "Fluated" specimen only the softer portions, the chalky cement between the Foraminifera and Globigerina, appear to have dissolved. We certainly consider that the "Fluated" stone has been practically improved and rendered more durable and impervious to the weather by the treatment of the surface.

AT a meeting of the Local Committee of the National Association for the Advancement of Art, held in Edinburgh last week, the schemes of the North British and Caledonian Railways, and their effect upon the city, were

considered. Dr. Rowand Anderson startled the meeting by saying that "he would be delighted to see most of the trees in the Princes-street Gardens removed. He thought the view of the old town and the Castle, and the whole aspect of the place was spoiled by these trees. If the great central valley went, however, Edinburgh would lose its most lovely and its greatest charm." Mr. Birnie Rhind, sculptor; Mr. D. W. Stevenson, sculptor; Mr. W. D. Mackay, R.S.A., and others differed from the opinion expressed by Dr. Rowand Anderson. Mr. Mackay said that "of course they could not expect Dr. Anderson to withdraw his statement for fear of its going abroad, but they could do all they could to neutralise the effect of it." It is true, as Dr. Anderson said, that he was not singular in the view he had expressed, for we have a distinct recollection of a grandiose design for a terrace adorned with sculpture and architectural monuments, which was exhibited by Mr. Dick Peddie at one of the annual exhibitions of the Royal Scottish Academy. At this time of the year, when the trees are denuded of their foliage, there is little obstruction to the view, and we are decidedly of the opinion of Mr. Stevenson, "that the view of the Castle through the trees might be more charming than if they could see it in a bold way from one end of the street to the other, without any such foreground." In fact, the proposal to assist in the beautifying of the valley between the Castle Hill and Princes-street by removing the trees seems to us one of the most extraordinary propositions we have ever heard, and we cannot understand how any Edinburgh architect anxious to preserve the beauty of the city could propose such a step.

WE regret to find that diphtheria has broken out at Marlborough College, admittedly one of the healthiest public schools in England. Fortunately, the disease seems to be of a mild character. The sanitary arrangements and the water of the College are believed to be excellent, but a rigid inspection is to be made of the whole premises, in order to leave no uncertainty about the matter. But the authorities of the public schools are now so alive to the necessity of first-rate sanitary conditions that we do not anticipate that there will be anything found to be wrong with the general sanitary arrangements of the school. The fact is, that illnesses of this kind cannot always be avoided in great schools; once, by some mischance, an epidemic or contagious disease is introduced, it is most difficult to prevent it from spreading. We have been informed that diphtheria has been in existence at the village of Manton, a mile or so from Marlborough. If this is so, it has probably, in spite of precautions, been carried into the College. Of the sanitary condition of this village, and of the efforts of the Rural Sanitary Authority to stamp out the disease at Manton, we have, at present, no information. Possibly this outbreak, the cause of which it should not be difficult to arrive at, may throw more light on the way in which diphtheria is propagated in places where buildings and sanitary arrangements are carefully looked after.

IN an article printed in the *Antiquary* for this current month, Mrs. Chaworth Musters gives an account of Leicester Castle. Directing attention to its imminent destruction, she writes:—

"The proposed new line of the Manchester, Sheffield, and Lincolnshire Railway Company is projected to run through the great hall diagonally, just shaving St. Mary's Church by a few yards, levelling the grassy mound on which stood the keep, and whether entirely destroying or only running close past the wall of the Trinity Hospital I am not aware; but, of course, the scheme, if carried out, means the utter destruction of this little group of historic buildings."

The buildings in question include the lately-restored church, two gateways, one of which is called "John of Gaunt's," the castle hall now serving as a court of justice, and Trinity



Hospital. This last-named was founded, to the Annunciation, in 1330 by Henry, Earl of Leicester and Lancaster, son to Edmond Crouchback; liberally endowed by his descendants, and known for a while as St. Mary's the Greater, it was refounded by the Corporation, and it has now an annual income of about 2,700*l*. The hospital stands in the Newark, or *Novum Opus*, which formerly constituted an outwork of the castle. It is said that William I. built the latter, on an earlier foundation, and making this ancient Mercian town into a royal demesne, gave the Wardenship to Hugh de Gentemaisnel. Having been razed to the ground by William Rufus, it was rebuilt by Henry I., and fortified by Simon de Montfort. Here Henry V. held a Parliament in 1414, and in 1425 one was held by the young King's uncles, the Dukes of Bedford and Gloucester, as "protectors" of the realm. Henry, Earl of Lancaster, and his two successors in that title, largely restored the fabric. But it was so allowed to fall into decay that on the eve of the battle of Bosworth Field Richard III., with his suite, was fain to lie at the Blue Boar Inn.\* In 1633 a royal order was issued to the Sheriff "to take down the old pieces of our castle at Leicester to repair the castle-house wherein our records of the honour of Leicester do remain." Upon Henry IV.'s accession, the Duchy and Earldom of Leicester merged in the Crown; in 1744 Sir Thomas Coke (Lord Lovel) was advanced to the earldom, which was revived in 1837 in favour of his great-nephew, Thomas William Coke, of Holkham Hall, Norfolk.

ANOTHER exhibition of bird studies by Mr. H. S. Marks is to be seen at the galleries of the Fine Art Society, and has proved equally attractive with the former one. The greatest successes of these studies appear to us to be among the parrots and eagles, the former especially (including cockatoos and macaws among the general tribal appellation of "parrots"). None are better than the studies numbered 2 and 4, in which both colour and texture are so admirably conveyed without any minute working up of detail. Other very good examples are 7, 40, 49, 60, 99 and 101. Among the eagle subjects is a very fine head of the Bateleur eagle (28) well known to all visitors at Regent's-park, and a large and grand drawing of the vulturine eagle (89). Again in this collection we find swans the weak point; there is only one drawing of them, and the swans in that seem heavy and wanting in swan-like grace and purity of colour; the painter does not seem to sympathise with them. Nor should we accept the portrait of the "Demoiselle Cranes" (44) as doing justice to those singularly graceful and delicate looking birds. The grotesque penguin is a bird after Mr. Marks's own heart apparently, and its capacity for the expression of humorous situations is done full justice to in "Romeo and Juliet" (5) and "The Peacemaker" (85). Naturalists and sportsmen will be interested alike in the careful drawing of "Pallas's Sand Grouse" (48), the reappearance of which in England raised a correspondence in the *Field* which spread over some months. Mr. Marks's preface to the catalogue is worth reading, and is full of humorous hits, especially against the visitors at the Gardens, who offer the eagles sponge-cake to eat (Mr. Marks thinks natural history is neglected in our schools), and who expect an artist painting in the Gardens to be a complete guide "not only to each house or cage in the gardens, but to every railway station or cab-rank out of them."

THE more one looks at exhibitions of photographs the higher becomes one's estimate of painters. For securing portraits of one's friends photography is a fairly ade-

quate and remarkably cheap expedient, and as such is a boon to humanity, though it usually fails in cases where the features of the sitter are very marked or characteristic, as it almost always exaggerates the special character. But look at the composed groups under different titles in the exhibition of the Photographic Society (now open at the Society of Water-Colour's rooms); at the rustic pair reading at their cottage-door, for instance, under the title "In the evening there is light;" this is intended for an idyllic picture such as we frequently find in the Society's galleries in water-colour time; but look at the hopeless vulgarity and inexpressiveness of this old couple set to pose for an idyll. That is realistic art, of which the camera is the true exponent; and what is it worth? A painter would have taken the same two figures, perhaps just as models for costume and position, but would have put the light of feeling and sentiment into the faces; not such as could not exist in nature, but such as we do not find in the average man and woman, which is the material photography has mostly to deal with. There are various other scenes in which real figures play a part, but they all point the same moral. Take the absolute realism of ordinary men and women, and there is little to make a picture of; it is the artist who makes the picture, the living figures are only the raw material. Landscape is equally a failure in pure photography. Look at the two large Goupil-gravures exhibited by Messrs. Bousod Valadon & Co.; they are worth more as pictures than any of the pure photographs. There is one branch of work only in which photography has a value beyond that of any other process, viz., in the representation of architecture, and it is just this which is neglected. There are hardly more than half-a-dozen architectural subjects in the whole collection. The photographs of racing yachts are interesting, as recording the actual movement of the vessels and set of the sails. The photographs of clouds are interesting and valuable. But the bulk of the exhibition strikes those who are accustomed to go to that room to look at pictures, as an illustration of what photography cannot do. It can not produce landscapes, and it can not make figure pictures. It only gives the prose of human life; we have to go to the artist for the poetry.

THE disastrous fire at Siena Cathedral, which has gone near to deprive the world of art treasures that could never be replaced, is again the work of plumbers, bringing their melting-pots and braziers in close proximity with timber in a more than usually dry and inflammable condition. Why do not those who are responsible for the safety of great architectural monuments exercise more control and supervision over this class of incendiary artisans? It is scandalous that the safety of buildings and works of art which nothing can ever replace should be left at the mercy of plumbers' journeymen.

PUTTING together the evidence of those letter-writers in the *Times* who seem to be most fully in possession of their reasoning faculties, we have little doubt that the smells complained of in the Paddington district, in the course of the sensational correspondence which has been recently going on, are due to the burning of refuse under brick-kilns in the west and north-west districts of London. This is a nuisance which ought to be put a stop to, but we have little doubt that it is very much exaggerated in the correspondence referred to. People who are allowed to write to a paper to air a grievance of this kind seem to lose their heads entirely, and deal in superlatives of the most tragic kind, which every reasonable person must know to be exaggerations. In fact, if the matter were as bad as is represented by some of the correspondents, the portion of London affected would have been deserted long ago. As one definite example of the exaggerations indulged in we may mention the letter signed "A Householder," in which it was stated that

"There is a large, open, iron grating just as you cross Baywater-road to go in the gate into Kensington-gardens, at the fountains, from which there is a horrible smell, so strong that you can perceive it twenty yards away. This shows the state of the drains in Paddington district." We went to the spot, found the grating in question, stood on every side of it, and stood over it, and there was not the faintest perceptible smell from it. So much for the reliance to be placed in anonymous correspondents.

#### THE ARCHITECTURAL ASSOCIATION.

THE first ordinary meeting of this Association for the present session was held on Friday, the 17th inst., at 9, Conduit-street, Mr. Leonard Stokes, President, in the chair.

The minutes of two previous meetings having been read and confirmed, the following gentlemen were duly elected:—Messrs. P. E. Newton, J. M. Sharman, J. M. Crean, S. Reddy, E. A. Sharp, A. Harston, E. A. Tombs, and L. Gough.

The Chairman proposed a vote of thanks to the Entertainments Committee for the trouble they had taken in connection with the recent *conversazione*; and in particular to Mr. Burrell, Mr. H. O. Cresswell, and Mr. A. W. Earle. This was carried unanimously, as also was a vote of thanks to the various firms who had come forward as exhibitors and who had lent objects with which to decorate the hall.

The discussion of the rules and the report of the Committee was deferred.

Mr. F. R. Farrow (Senior Hon. Sec.) announced that, in accordance with the will of the late Mr. Ernest C. Aytton-Lee, past President of the Association, twenty-seven books had been handed over to the Association. He wished to move a formal vote of thanks to Mr. Lee's executors, Mr. H. W. Lonsdale and Mr. C. Henman, for their kindness in handing over the books to them.

It was also announced that the session 1890-1 of the Lyric Club would commence on the 28th inst. with a smoking-concert at the Mona Hotel.

The Chairman then presented the prizes gained during the last session. The following is the list:—

*A.A. Travelling Studentship*.—Awarded to Percy D Smith; second, Sydney Tagwell.  
*Coley Prize*.—F. M. Simpson.  
*The A.A. Medal*.—Wm. Pywell.  
*The Essay Prize*.—Henry G. Gamble.  
*The Architectural Union Company's Prize*.—First, W Wounacott; second, not awarded.  
*Lectures on History*.—First, A. T. Walmsley; second and third, S. W. Cranfield, J. W. Hall, W. B. Hopkins (equal). Hon. Mentions:—C. Wymouth, J. Murray, C. J. Shaw.  
*Lectures on Construction*.—First, A. T. Walmsley; second and third, Victor T. Jones, G. H. M. Trew (equal).  
*Elementary Class of Design Sec. I.*—First, C. O. Law; second, H. C. Lander. Hon. Mention, F. G. Hicks.  
*Elementary Class of Design Sec. II.*—First, Kotaro Sakurai; second, H. C. Lander.  
*Elementary Class of Construction*.—First, H. C. Lander; second, W. B. Hopkins.  
*Elementary Colour Decoration Class*.—First, C. O. Law. Class Prize, F. R. Gould Willis. Hon. Mentions, H. G. Lidstone and A. T. Griffith.  
*Class of Design*.—First, E. C. Fetch; second, Alfred Cox; third, J. Hatchings.  
*Colour Decoration Class*.—First (Time Sketch Prize), F. C. Christmas.  
*Class of Construction*.—First, H. J. Leaning; second, J. W. Hall. Hon. Mention, E. Penfold.  
*Advanced Class of Construction*.—Not awarded.  
*Lectures on Quantity Surveying*.—First, T. Murray; second, H. Emrich; third, not awarded.

The Chairman next delivered his Presidential Address as follows:—

#### Mr. Stokes's Presidential Address.

GENTLEMEN,—In the address which I delivered you from this chair just a year ago, I endeavoured to show you, as far as I was able, what perhaps you were all perfectly aware of,—that it was no easy thing to be a good architect, the qualifications, special knowledge, and other requirements being not only numerous but also such as are not generally met with in everyday life. I told you that before entering our profession a young man should make himself thoroughly acquainted with its special requirements and his particular capability to meet such requirements. I also insisted upon the fact that special or technical education was necessary after entering our profession beyond that which is usually imparted to a pupil in an architect's office; stating that that which might be termed the "picking up" system now almost universally in

\* Pulled down about sixty years ago. See the woodcut in Charles Knight's "Pictorial Shakespeare," iv. 314. The site of Grey Friars, where the King was buried, has lately been covered by an elastic web factory. His bedstead was preserved, and found to contain a large sum of money.



vogue was a defective and delusive one, unfair alike to the pupils and to their parents or guardians; I did not, however, suggest any alteration in the system, beyond advocating some systematic course of study to be taken in conjunction with the work done in an architect's office, as I felt that, supplemented in this way, the system might perhaps be as good a way of training a young architect as any other. I also ventured to criticise the work of our Association, making sundry suggestions as to possible improvements in our methods, dwelling at some length upon the advisability of a joint action between this Association and the Royal Institute of British Architects with regard to the question of education. Reading through my address again I am surprised to find that I had the courage to say as much as I did upon this subject,—which I am afraid is not a popular one,—and disappointed to think that all I did say practically ended with the miniature storm which I myself created in my own little teapot.

The President of the Institute, in his address delivered shortly after mine, certainly did say,—"I commend Mr. Stokes's utterances on this point to the attention of every member of the Institute and the Association, believing as I do that the senior and representative body of the architectural profession will do wisely, if the way can be made clear, to give substantial help to those who, during a long and prosperous period, have shown an earnest determination to help themselves." But from that day to this, no further words of encouragement or offers of help have reached us from the Institute.

I alluded last year to the fact of a Special Committee having been appointed to consider and report upon the whole working of the Association, and it is now a matter of history that that Committee did report to the General Committee, who adopted the Report, and in their turn presented it to you for your adoption. What happened after that is a little complicated, and as we shall shortly have to decide what course we really intend to take with regard to the carrying into effect of the recommendations contained in the report, I think I had better try and clear the ground a little by stating the exact position of affairs. Briefly, then, we stand thus:—The recommendations contained in the Report of your Committee,—for the Education Committee's Report has now become the General Committee's Report,—having been embodied in a series of resolutions, these were put one by one to a special business meeting held in June and carried, instructions at the same time being given to the Committee to take the necessary steps to carry these resolutions into effect. The first step the Committee took, however,—viz., proposing some alterations in the rules to make them accord with the resolutions passed,—was met, in a perfectly straightforward manner, by the presentation of a requisition, signed by a considerable number of well-known names, asking for a change in the method of voting. The presentation of this requisition somewhat complicated matters, and disclosed the fact that our rules were not as consistent as they might be in some respects; this, taken with the fact that the session was really over, led to the adjournment of the whole question of the proposed alterations in the rules until the present session. In order, however, to save as much time as possible, a Committee was appointed to consider and report upon the whole question of our rules at as early a date as possible this session.

Our present position is therefore simply this, that we, as an Association, have passed a series of resolutions stating that certain changes in our methods, &c., are desirable, but have not as yet made any alterations in our rules.

Having gone so far in stating our position with regard to this matter, I should like, with your permission, to go a little further, not that I wish to advise you one way or another on this subject, as I shall in all human probability shortly have to sit in this chair, and endeavour to conduct impartially the meeting at which your decision will be come to; at the same time, I believe there is no reason why I should not lay the whole question before you, so that you may perhaps be better prepared to vote when the time comes.

In the first place, I take it that everyone in this Association is proud of his profession, and wishes to see it take its proper position before the world. Architecture, as we all know, is a fine art, and an architect an artist. Architecture is also essentially a useful art, and an architect a utilitarian. Architecture is, again,

a constructive art, and an architect a constructor. Now, a man may be born an artist, and unless he, at any rate, is endowed with artistic instincts, he will never make an architect; but I doubt if many men are born utilitarians or constructors; but, even if they are, technical education will develop their powers in the same way that artistic surroundings and sympathetic associations will stimulate an artistic temperament. From this we gather, I think, conclusively, that an architect requires a special education or training, and the only point that there can be any difference of opinion upon is as to the amount and nature of such education or training.

One form, and a certain amount of training, has hitherto been obtainable at this Association, and if you think it is the right form, and of proper quantity to meet the case, don't be persuaded to change; but if, on the other hand, you agree with your Committee's Report on education, and think the form capable of improvement and the quantity somewhat scanty, then why not go in for an improvement as proposed, at the expense even of old associations and traditions? This Association is not even now carried on in the way it was originally intended, and I venture to assert that a body like ours cannot remain stationary; it must move with the times, otherwise it will be deserted. Here I think we might ask ourselves, how it is that, with hardly an exception, all our classes show a falling off in popularity during last session, and for the matter of that during the last two or three sessions? Is it because the classes are not so good as they were? I think not, for I believe myself that they have been more ably conducted than ever; but perhaps it is that something more is now required than is supplied by our classes, something more in touch with the times, and less haphazard than some of our instruction is. If this is so, and as we have already broken tradition once, why not do so again if there is good cause? I confess that personally I admire and agree with the originators of the mutual system, and I can conceive few things more interesting and instructive for men of a certain standing than meeting with their fellows on an equal footing, and forming classes, where good-natured criticism and debate formed the method of gaining and imparting information. This, however, is almost a thing of the past; neither is it suited to the younger men, but it is to be hoped that what little remains of the old system will be jealously preserved. The great majority of our classes, however, are not worked on this principle. The blind leading the blind is perhaps too strong an expression to use in our case, but exaggerations often illustrate a meaning better than an exact simile. The very short-sighted, however, often find themselves being led by the short-sighted, and not only this, but by fresh short-sighted guides at every crossing. A dog is a very effectual guide when properly trained, but a series of young dogs new to the work would try the temper of the best of blind men in a journey across London.

There is an art in imparting knowledge which is not possessed by everyone; but everyone who has that art should be pounced upon by this Association, and encouraged to work in forwarding the cause of architectural education; and when I say encouraged I mean encouraged, and that substantially too. For although a man may be able to find out for himself all that he may require in a given time, yet if a qualified instructor can impart that knowledge to him in half the time, surely something is gained, for time is everything in this go-ahead age. I don't say that much can be done for your heaven-born genius, but for the average man a great deal may be done; and as of necessity we have rather more average men than we have geniuses, I think we shall not be doing a bad work if we can improve these average men, until, perhaps, if we are fortunate, they are almost as good architects as the more fortunate genius. Surely this is worth working for; for who is it that we meet at every street-corner? the average man. Who is it we meet when we go into a church? the average man,—as a rule. Who is it we meet when we attend public meetings, stop at an hotel, or visit a friend in the country? the average man. Your genius is rarely met with; and, although I do not wish to disparage him, I think he is quite able to take care of himself, and as a rule, will not be interfered with. But these are the exceptions, and as I have said before, our friend the average man is the one we want to improve.

There are some, I know, who think that the fees that were named in the Education Report as fair remuneration to the instructors and lecturers were quite inadequate for their purposes, and I am inclined to agree with them. At the same time it must not be forgotten, in the first place, that these figures were only suggested *average* amounts; some subjects being so much more simple than others that quite a small staff would be adequate for the purpose, thus leaving more for the more difficult and advanced ones, and, in the second place, that at first the supply of good teachers might be so small that high fees would be out of place, at any rate until the teachers had proved themselves efficient; for, cannot help feeling that this is the one great difficulty to contend with,—the want of men really suited for teachers; but it is to be hoped that the demand will produce the supply in the case, as it almost invariably has in others.

If I am stating the case too strongly in favour of change it is only because I cannot find arguments to produce on the other side. If the Association does not supply proper teaching, other societies must and will. Of course, there is a reason why they should not; but, if they do, the Association must be prepared to go to the wall. At King's College already fresh help is apparent, and, together with the Carpenter Company, great things are to be done. At Edinburgh the architects there have presented a memorial to Her Majesty's Commissioners for the Scotch Universities, asking for the establishment in the University of Edinburgh of a course of instruction in architecture. In their memorial they refer to the Architectural Association, stating that students in London have the advantage of attending classes at this Association held with a view of preparing students for the Institute examinations. I am afraid the architects at Edinburgh do us too much honour, as I do not fancy that a student who confined himself to attending classes at this Association would stand much chance of passing the Institute examinations.

Professor Roger Smith, in his opening lecture at University College the other day, called attention to our proposed curriculum, and while criticising some details, spoke not unfavourably, I think, of the scheme as a whole, and we all know that Professor Roger Smith's opinion is as well worth having as that of any man in London. The professional press, too, has, I think, without exception spoken favourably of our proposals, devoting a considerable space to leading articles and reports of our meetings.

On the other hand, we are told that we are tending too much towards an academic course, and that the individuality of our future members will be lost, and thus the "glorious freedom" of our national architecture impaired. I am a great believer in individuality myself, but I fail to see how a little more system in the training of our students will lessen their individuality. We cannot send each of them to a desert island to work out a "style of architecture" for himself; but what we can do is to deliver him from the individuality (!) of Bayly, water or Brixton by laying before him other influences which will open his eyes to the reasonable, and I hope to the beautiful, in architecture. I have looked carefully through our curriculum with a view to finding, if possible, where our scheme was likely to absorb the individuality of our members, but I fail to find any such possibility, the scheme being so elastic that the individual tastes and tendencies of students will be encouraged and developed,—as they are at the Academy schools at the present moment,—and not compressed into one mould as in some of the foreign schools. The individuality of the painter and sculptor is not endangered by the study of the old masters, neither is the work of an author or poet less the work of a genius because an apt quotation or allusion to the work of another is introduced into his writings. But I think we are all agreed by this time that a liberal education, if not absolutely necessary to an architect, will at any rate be found of the greatest help to ninety-nine out of every hundred.

This is felt so strongly by some that they have already offered us the help of their purses, Mr. Florence, through an invisible friend, offering us a hundred guineas to improve our library, and Mr. Seth Smith a guarantee of 50% a year for three years if we will start our new curriculum; and I have little doubt but that many others will come forward when they see that we really have made a beginning, or are, at least,







*Royal Academy Exhibition, 1890.*

COMPETITION DESIGN FOR COURTS OF J





—MR HENRY T HARE, A.R.I.B.A., ARCHITECT.





determined to make one. The present system of pupilage remains quite unaltered in our proposed course; all we ask for is that pupils and improvers may be allowed proper time to attend the classes at the Association. For this class of members we are anxious to establish a course of day classes, so as to relieve, as far as possible, pupils from any large amount of evening work.

I now come to the point in our proposals of last year that I consider of the least real importance, yet it is almost the only one which met with any serious opposition. I refer to the proposal to raise our annual subscription. It would almost seem as though this question of half a guinea, more or less, was going to set us at each others' throats to do or die, on the particular side we may have happened to espouse. This is a thousand pities, and I trust we shall be led by our common sense and not by feeling, for the question is really a very simple matter of £. s. d. If you think certain changes in the working of the Association,—e.g., the opening of the library in the daytime, and the employment of a paid assistant secretary,—desirable, are you prepared to put your hands in your pockets and produce the necessary funds? If not, you cannot have them, i.e., unless you are ready to forego some of the other advantages you now enjoy, such as the *conversations* or the *soirée*, or both.

Another way out of the difficulty was proposed at the time by Mr. Cole Adams, I think, viz., that the subscription to all incoming members should be raised, that of existing members remaining as at present. I regret now that this suggestion was not adopted, as I believe, with a little care, that the money thus procured would prove enough for us to introduce what we want by degrees, instead of all at once as was intended. It is not even now too late to adopt this course, which has some advantages, and I think it not improbable that this course may be laid before you, by your Committee, when the proper time comes.

One more point and I have done with our present troubles: I refer to the proposal that we should vote by means of voting papers, and not by show of hands, as hitherto, on subjects affecting the rules, &c., of this Association. There is something to be said in favour of the proposal, but at best it is a lazy way of voting; and if this Association is to go on with spirit as hitherto has, I think the old-fashioned way of coming to the meeting and hearing the arguments on both sides of the question, and then holding up your hand either for or against it, is far more suited to our ways than voting in cold blood, perhaps without being properly alive to the question at issue.

I take it that no President ever read an opening address to any body or association without feeling it his duty to make at least one suggestion, and I feel that I have now come to the point in my address when such a suggestion should be made,—not in the present case, however, simply for the sake of making it, but because I feel that if the suggestion I am about to make were adopted, we should be in a much stronger position than we now occupy, and if we are to do much in this matter of education the stronger our position is the better.

I would, then, suggest that we follow the example of the architects of Edinburgh, and memorialise some one. I am afraid it is no use our going to the University of London, as they probably would not listen to us,—at any rate, at present; therefore I think we had better go to the Institute and boldly ask it to either establish some course of architectural training itself, or to help us to amend and strengthen our methods so as to meet the requirements of the case. The Institute is practically pledged to do something more for education than it at present does, for, in the words of its charter, "the Council may, subject to such limitations or restrictions as by laws may from time to time prescribe, apply the funds of the Royal Institute in furthering professional education and in conducting all examinations which the Royal Institute may hold under the authority of this our charter," &c. Observe, the funds may be applied to furthering education and conducting examinations, two distinct objects; but if the Institute will not help us, then I think we might summon a general conference of architects, and get their support if possible, or at any rate hear what was to be said by them with regard to our proposed curriculum.\*

\*We will give the conclusion of the President's address, and the discussion which followed it, next week.

#### THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council took place on Tuesday, at Spring-gardens, Sir John Lubbock, M.P., presiding.

**Wood Paving at Fulham.**—The report of the Finance Committee stated that the committee had considered the application of the Vestry of Fulham for sanction to borrow, and also for the loan of £12,360, repayable in six years, to defray the cost of wood-paving works. The Vestry proposed to take up, to a depth of 1 ft., the existing macadam over an area of about 20,059 yards in the carriage-way of the Fulham-road, from the "George" public-house to Putney-bridge, and to lay down about 20,059 square yards of cross-cut deal blocks, 9 in. by 5 in. by 3 in., upon a bed of cement concrete 6 in. in thickness, and to reset the kerb and footway paving where necessary between the points referred to, a distance of about two miles, at an estimated cost of 20,360*l.* (including 588*l.* 11*s.* for contingencies and supervision). The Committee saw no objection to the advance if limited to 12,300*l.* and repaid in five years, and they recommended that the application be granted.

This was agreed to without discussion.

**Withdrawn Tenders.**—In the report of the Standing Committee the following recommendation was brought forward and agreed to without discussion:—

"The Council will not accept the tender of any person or firm who shall on any previous occasion have withdrawn a tender after the same has been accepted by the Council, unless the reasons for the withdrawal were such as to appear satisfactory to the Council."

**Open Spaces.** The Parks and Open Spaces Committee reported that their attention had been drawn to an opportunity which had arisen for purchasing Bostall Woods, a pine forest of about 74 acres adjoining Bostall Heath, an open space of about 55 acres already under the control of the Council. It was true that Bostall Heath was at the extreme verge of the county, and that the land adjacent thereto was unbuilt upon to a great extent. Owing, however, to the development of the tramway system and other causes, houses were rapidly being built, and it was a mere matter of time for the last portion of vacant land in this part of the county to be disposed of. In these circumstances, the acquirement of the freehold of Bostall Woods at the moderate sum of 200*l.* per acre, only half of which the Council would be required to pay, the District Board providing the remainder, was an opportunity not to be lost. The Committee had visited the woods, and found that practically no expenditure upon them was necessary. The Committee had had before them a deputation from the Plumstead District Board, urging the acquirement of the woods. The Committee recommended:—

"That, subject to the Plumstead District Board agreeing to contribute 100*l.* an acre towards the purchase of Bostall Woods, and to pay such amount to the Council when called upon, and also subject to an estimate being submitted to it by the Finance Committee, as required by the statute, the Council do agree to purchase from Sir Julian Goldsmid an area not exceeding 74 acres, at 200*l.* an acre, under the powers given to it by the Open Spaces Acts, 1877 to 1894."

A long discussion followed this recommendation, several of the speakers thinking it better that the Council should confine itself to acquiring open spaces within the metropolitan area.

Mr. Lloyd opposed the recommendation on the ground that the land was not worth £200 per acre.

Mr. John Burns supported the proposal of the Committee. In the interests of the thousands of artisans and their families employed at Woolwich Arsenal, the Committee was right in asking the Council to vote the money.

After two amendments had been defeated, the recommendation of the Committee was approved.

**Vauxhall Park.**—The Parks Committee also reported that they had reconsidered their recommendation that the Council should not undertake the maintenance of Vauxhall Park. The late Metropolitan Board of Works had contributed 1,500*l.* per acre; but the duty of maintaining the park had been vested in the hands of the Vestry of Lambeth. The Council maintained many smaller places, and the Committee recommended that it should undertake the future maintenance of Vauxhall Park.

Mr. Corbett moved an amendment, which was carried, to the effect that, considering that Mr. Beaufoy, M.P., had guaranteed the maintenance

of the park for two years, the recommendation be disagreed with.

**Proposed New Lunatic Asylum.**—The Asylums Committee reported that they had had from time to time under consideration a letter from the Commissioners in Lunacy, on the question of the provision of proper accommodation for the insane poor of the county of London, which they pointed out was wholly insufficient. The Commissioners had ascertained from the returns that on Jan. 1, 1890, the number of insane patients chargeable to unions or parishes in the county of London and to the county itself, who were placed in out-county asylums or in licensed houses, was 3,419. For the patients so placed accommodation should properly be found in asylums belonging to the county. To supply this accommodation, the Asylum at Claybury for 2,000 patients, and the extensions at Cane-hill for 800, were in course of erection. It was not probable, however, that either would be complete within two years from that time. Taking account of the annual increase of pauper lunatics in the county of London, who had to be provided for, it was certain that the new accommodation, when ready, would be at once fully absorbed by existing patients, and that none would be left for freshly occurring cases.

The Commissioners urged the importance of a careful forecast of the probable prospective requirements of the county of London in the matter of asylum accommodation, and of timely action towards providing what might be found to be necessary. Judging from the past, the Commissioners could not hope that the accumulation of lunatics in the future would be materially lessened, and they did not suppose that the need of public provision for their care in asylums would be removed. It would, therefore, they thought, be prudent in the County Council at once to initiate preliminaries for the erection of another large asylum, or, which no doubt would be better, of two of moderate size. The Committee felt that it would not be wise to postpone action in this matter any longer, and recommended:—

"That they be authorised to take such preliminary steps as they think best for promptly providing further asylum accommodation for 2,000 lunatics, provided that no engagement or liability be entered into without the sanction of the Council."

Mr. Boulnois, M.P., moved that the consideration of the matter be postponed for six months.

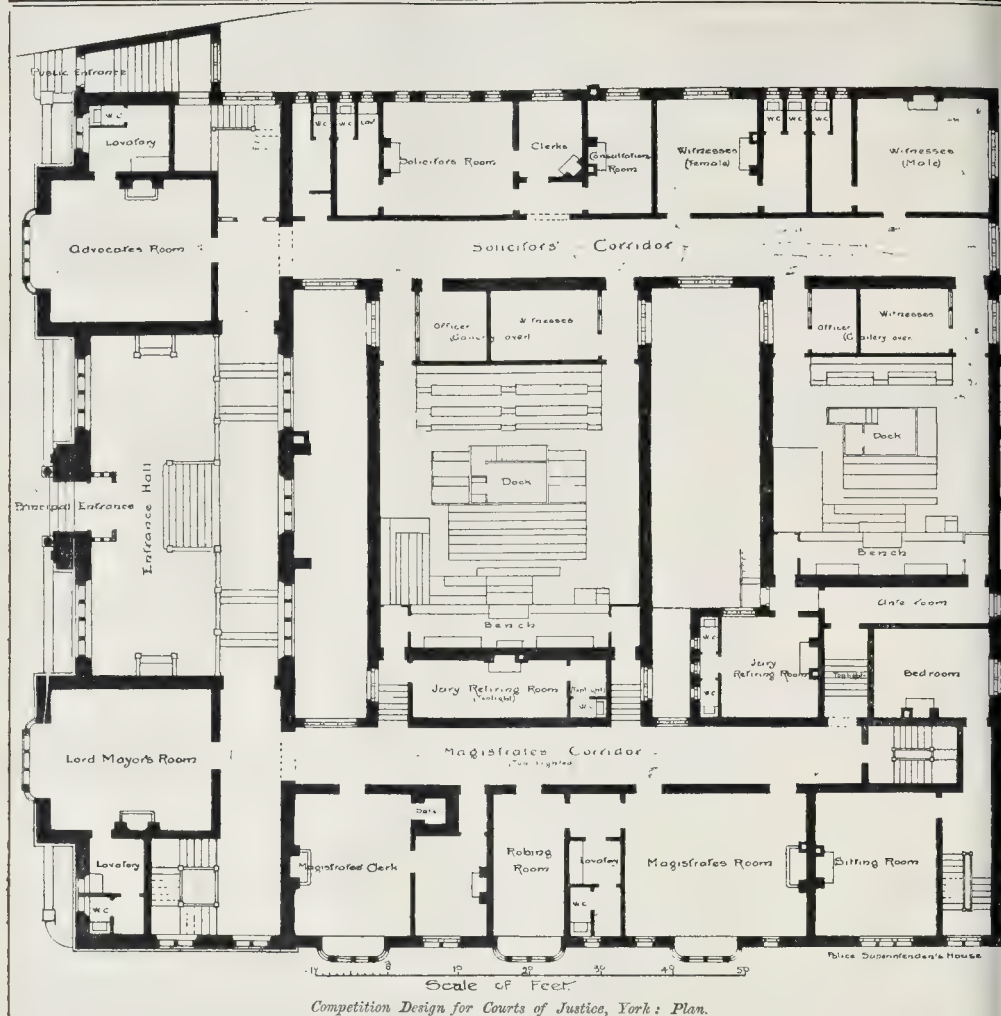
Mr. Young said there were at present 3,419 of the lunatics of the Metropolis boarded out by the Council, each one of whom cost from 3*s.* to 4*s.* more per week than the lunatics in their own asylums.

After the amendment had been lost, the recommendation was agreed to.

**Condition of the Thames.**—The Main Drainage Committee submitted a report of the chemist on the condition of the Thames. While the rainfall from January to September, inclusive, had been the same as the average for the corresponding period during the past seventy-five years, that during September was 2.4 in. below the average. The total flushing power of the upland water was nevertheless less than the average in consequence of the ever-increasing intake of the water companies in the upper parts of the river. The five water companies, whose supply was drawn solely from the river Thames, supplied to their consumers in 1889 a daily average of 51,591,000 gallons. In 1879 they supplied 68,139,000 gallons, whilst in 1889 the quantity amounted to 83,468,000 gallons. Thus 32 millions of gallons more water were abstracted daily from the river than during 1869, or nearly 19 thousand millions of gallons per annum. On the 6th inst., accompanied by the Medical Officer, he made an inspection of the river from Charing-cross to Wandsworth at low water, when the foreshores were exposed, and from the result of that inspection, and the analyses of samples of water, he was of opinion that no injury to health could accrue from the character of the river at that time.

The Council soon after adjourned.

**THE ELECTRIC LIGHT AT GODALMING.**—The town of Godalming, Surrey, has decided to adopt the electric light for public lighting purposes. The light was in use in Godalming some years ago, and it is claimed that this town was the first in England lighted by the new illuminant. The motive power was water, but this not proving satisfactory, the light was discontinued for a time. It is probable that the Charterhouse School, which has its own gasworks, will be included in the scheme for electric lighting.



Competition Design for Courts of Justice, York: Plan.

### Illustrations.

#### COMPETITION DESIGN FOR COURTS OF JUSTICE, YORK.

**T**HIS design, by Mr. H. T. Hare, was exhibited in the Architectural Room at the last Royal Academy Exhibition.

The materials proposed to be used were Tadcaster stone for the principal elevations, and Westmoreland green slates for roofs. The entrance-hall was designed with an open-timbered roof in oak. We append a plan of one floor with which the architect has kindly supplied us.

#### HARROW SCHOOL MUSIC-ROOMS.

THESE are essentially utilitarian buildings, the design being moulded by the peculiar necessities of the accommodation. The purpose has been to provide a series of small chambers, in which separate single music lessons could be given,—side by side, and yet so that each should not be disturbed by sounds from its neighbour. Also a room sufficient for the teaching of a brass band, placed so that the bray of the cornet and oboe might be inaudible, not only to the rest of the building, but also to the occupants of the neighbouring houses. Finally, a large hall was needed, not for concert purposes, but for the teaching of an orchestra, with sufficient air-space to give their full value to the instruments. A large

floor had to be provided to accommodate the large "house-choirs" which are a feature of Harrow School music.

Each of the rooms had to be thoroughly ventilated without fireplaces, and so that there was no chance of the sound penetrating from one to the other through the ventilation-shafts.

In the small music-rooms, shown on each side of the small plan on the lithograph, doors and windows are double, as are also the floors and ceilings. An in-draught of nearly two square feet area is provided for each small room, and an out-draught of about three square feet. It is proposed to change the air of each room four times an hour. The contract for the building is 4,410*l.*, the cost being defrayed by the subscriptions of old Harrovians and others interested in the school.

The drawing from which the lithograph is taken was exhibited at the last Royal Academy Exhibition.

#### HYMER'S COLLEGE, HULL.

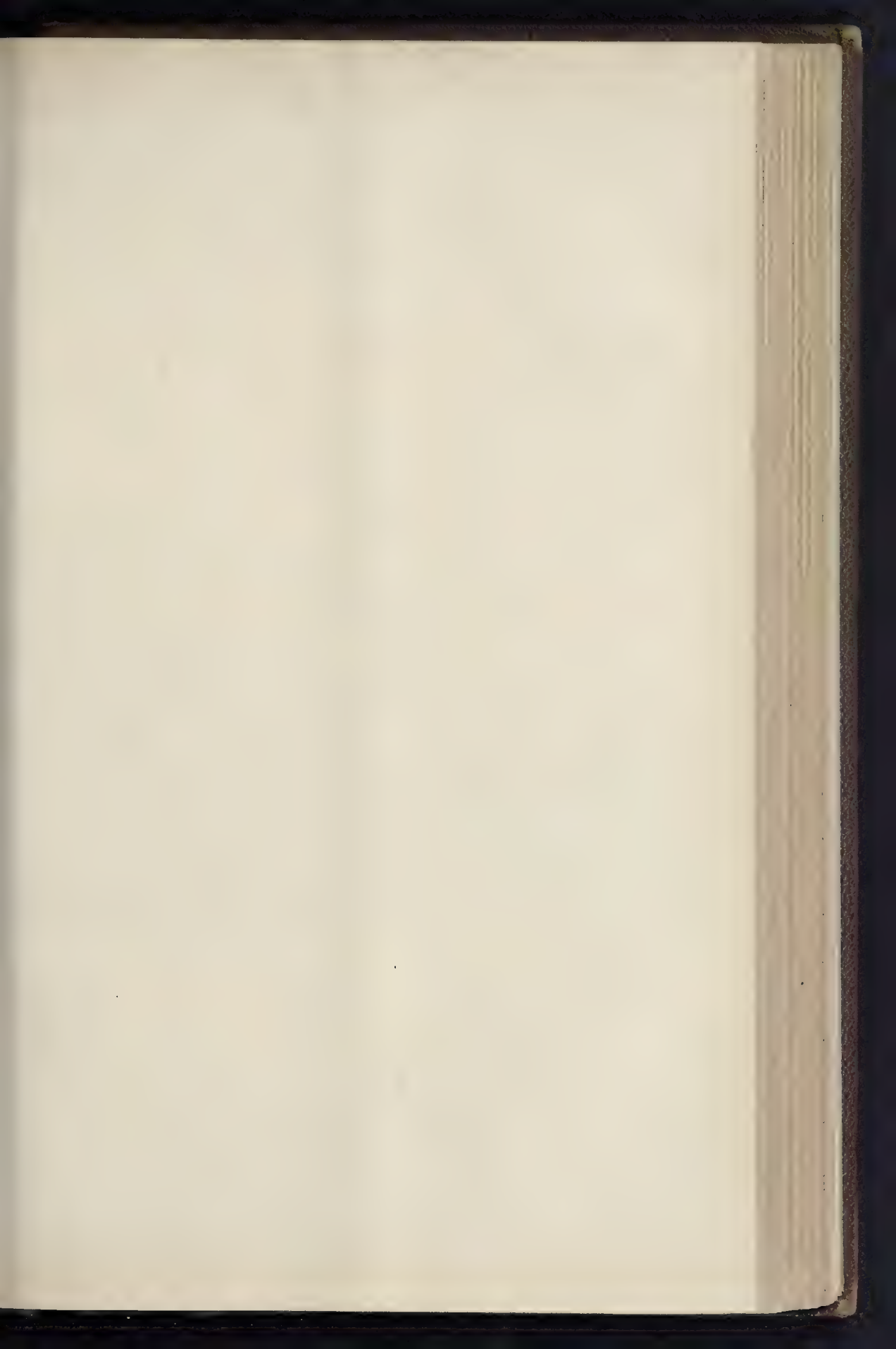
THE drawings illustrated in this issue are from those prepared by Messrs. Chorley and Connors, of Leeds, and which were awarded the third premium. The Assessor, Mr. E. C. Robins, reported on the design as being "one of the most original and interesting of the artistic designs."

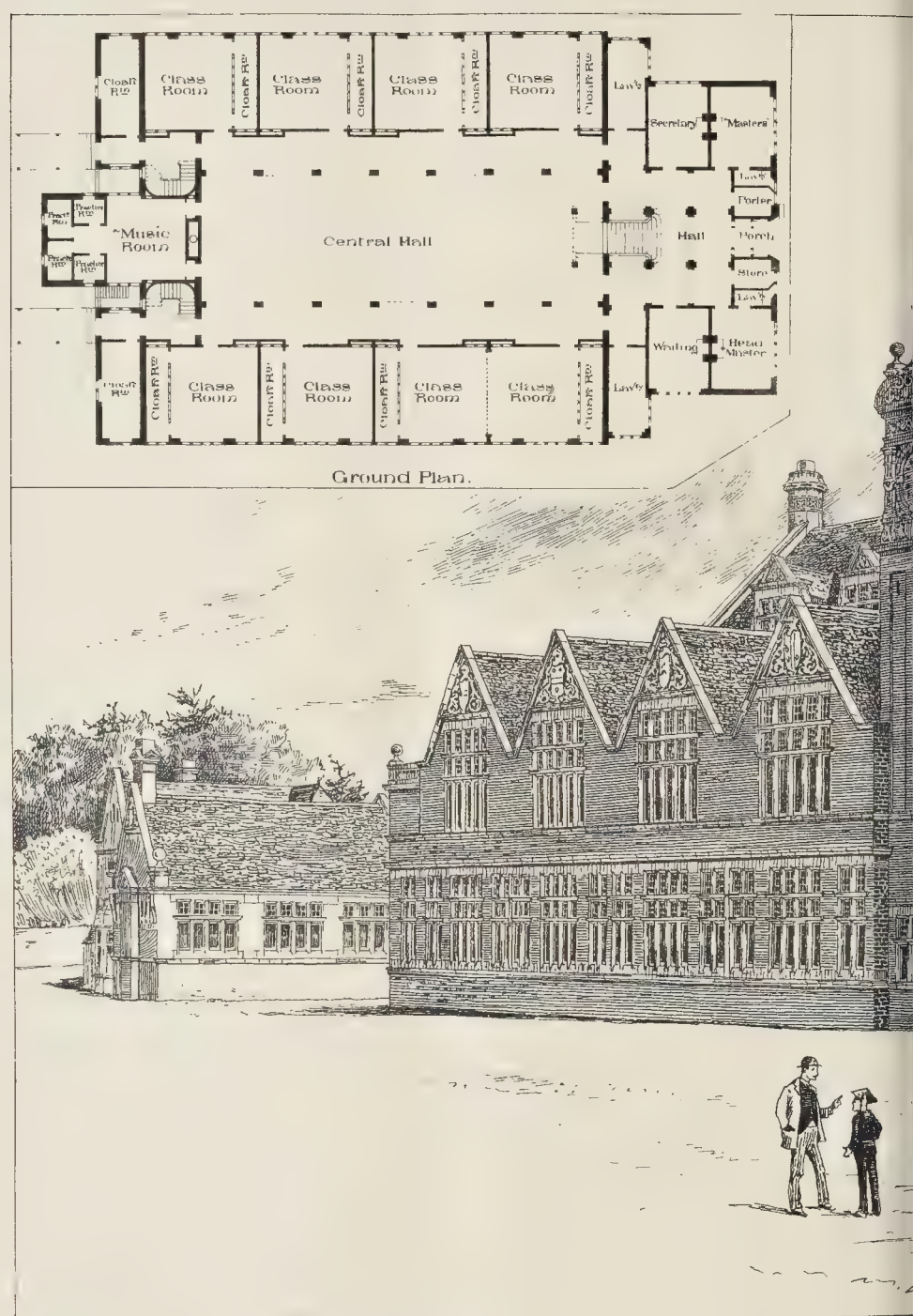
The plan appended shows the general arrangement. We commented on the premiated designs in some detail at the time the drawings were exhibited.

#### OLD WORK AT LEICESTER.

THERE are several remnants of bygone times still standing in the oldest thoroughfare of this ancient town, those of which sketches are given (page 329) being amongst the most interesting, and of which I have been able to gather a few particulars. The Tower in High street is a prominent feature, projecting, as it does, several feet on to the footway. The following inscription is attached to the structure, viz., "This turret is part of a building, in which, in the reign of Queen Elizabeth resided Henry, the third Earl of Huntingdon, in which Mary Queen of Scots lodged for a night in the year 1586; in which also King James I. lodged in 1612, and his son, Charles I. in 1642." The old brick gabled shop standing exactly opposite forms a striking contrast in height. The old house in St. Nicholas-street is interesting from the facts mentioned on the inscription-plate attached to the building, of which the following is a copy, viz.,—"In this house John Bunyan was once lodged; also John Wesley, on his first visit to this place, in 1770." The half timbered houses formerly standing in Highcross-street, were pulled down some five or six years ago to make way for an extension of the adjoining coffee-house, &c. This old structure was one of the few remaining buildings standing in the thoroughfare of the old Cross Market, and stood near the site of the old Market Cross, which was removed to another part of the town many years ago. The old Town-hall, in Town-hall-lane, "was," says







THIRD PREMIATED DESIGN FOR HYME



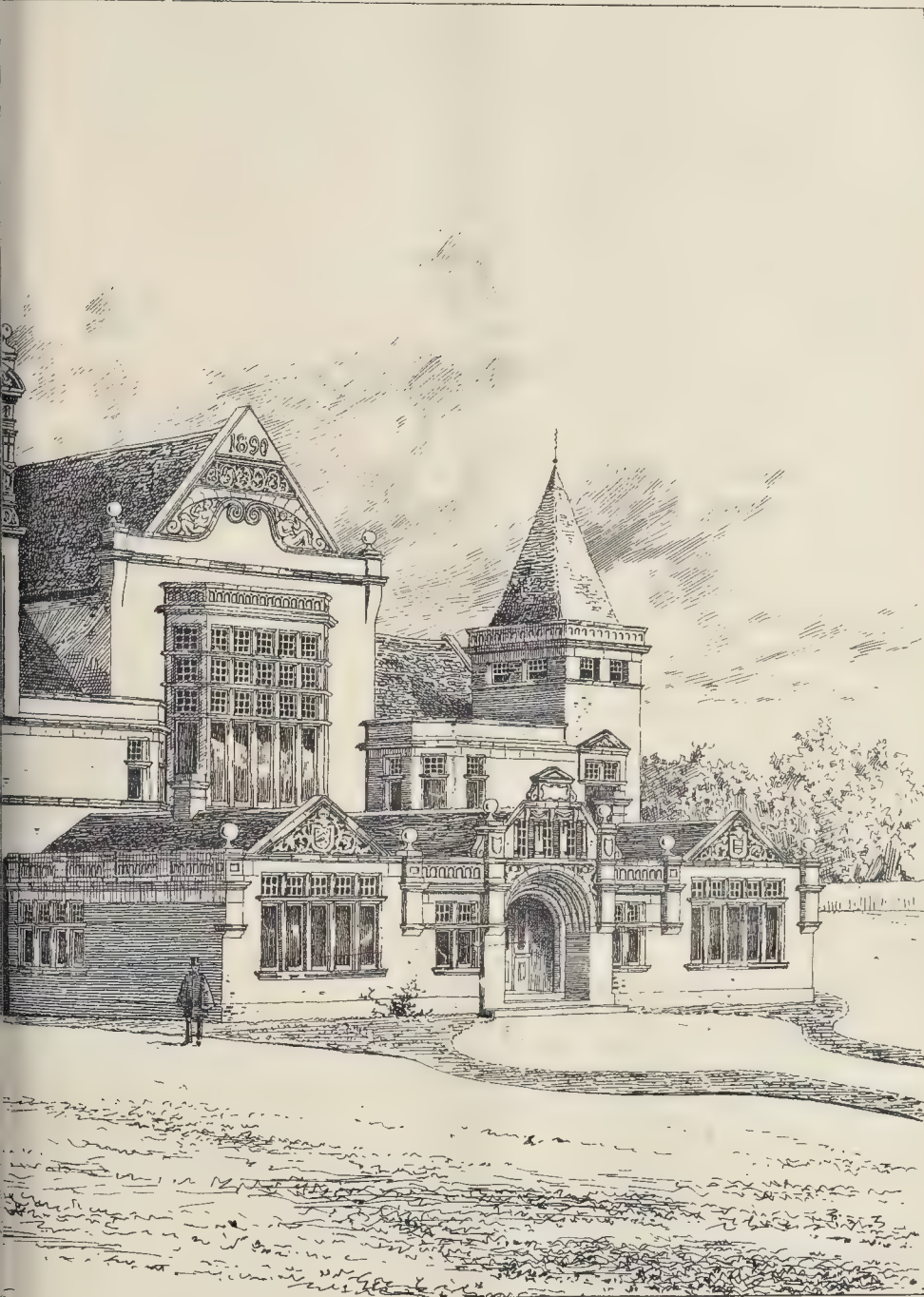
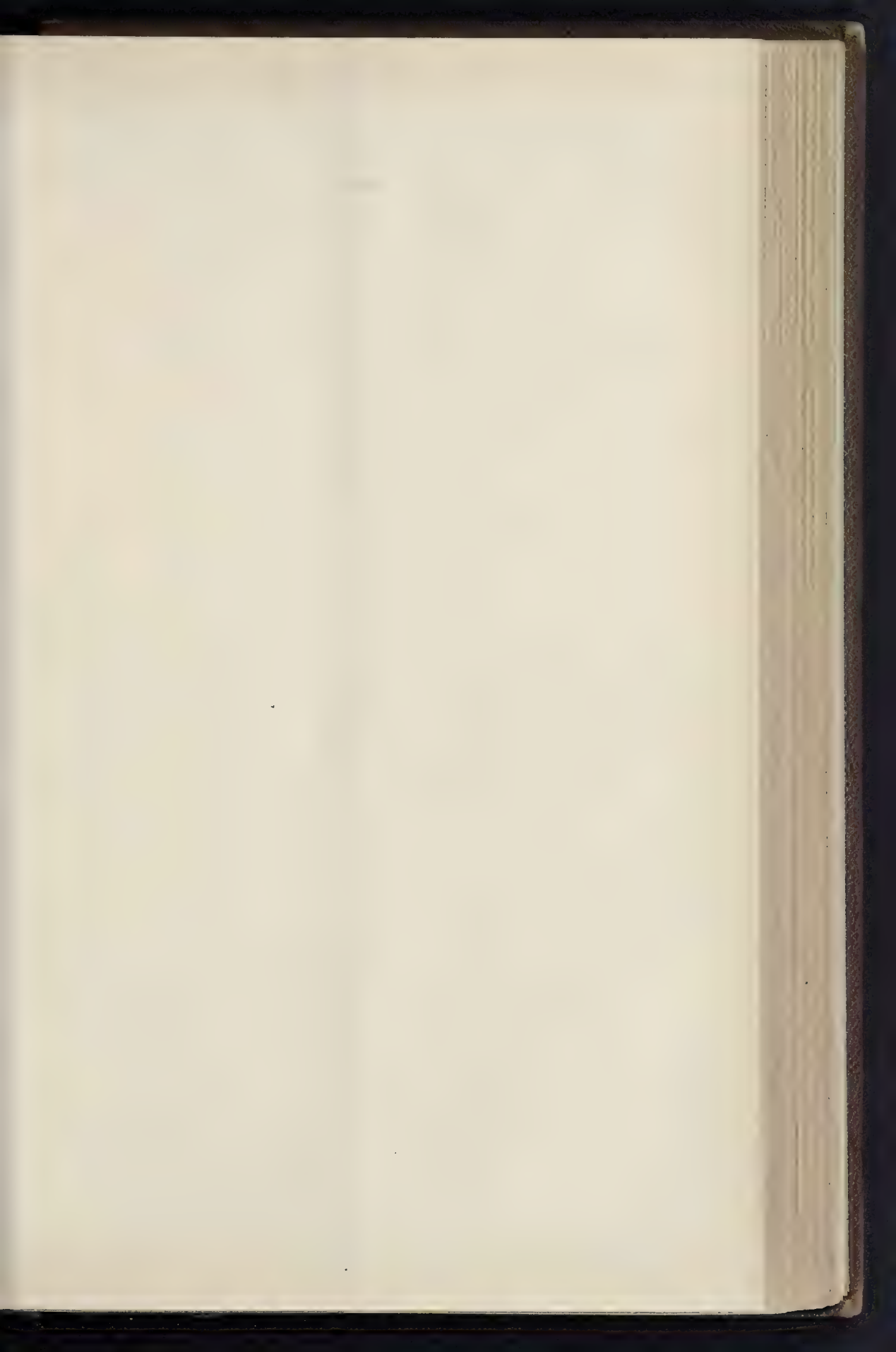


PHOTO. BY T. WALLACE & CO. 22, MARKING LANE, LONDON E.C. 4.

HULL.—MESSRS. CHORLEY & CONNOR, ARCHITECTS.

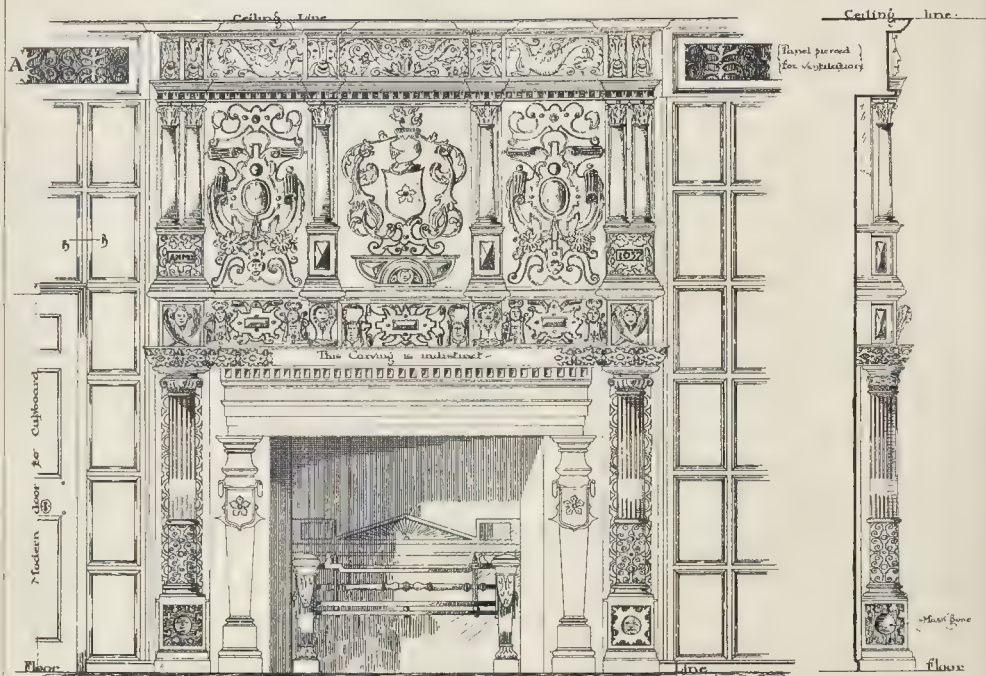






OLD TOWN HALL - LEICESTER.

- Scale of Feet -



Front Elevation

Side

This architectural drawing shows the interior of the Mausoleum at Halicarnassus. It features a central rectangular chamber with a pedimented ceiling. The word "Grotto" is inscribed on the wall. Two large circular niches are located on the sides, each containing a statue. The drawing is a black and white line drawing.

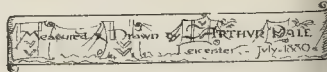
Man through lower portion



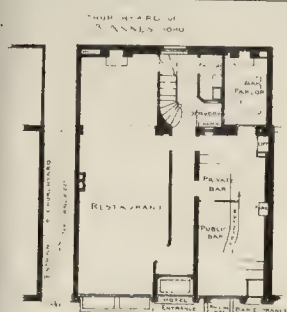
Carving at A.  $\frac{1}{4}$  full size.



Run through upper portion







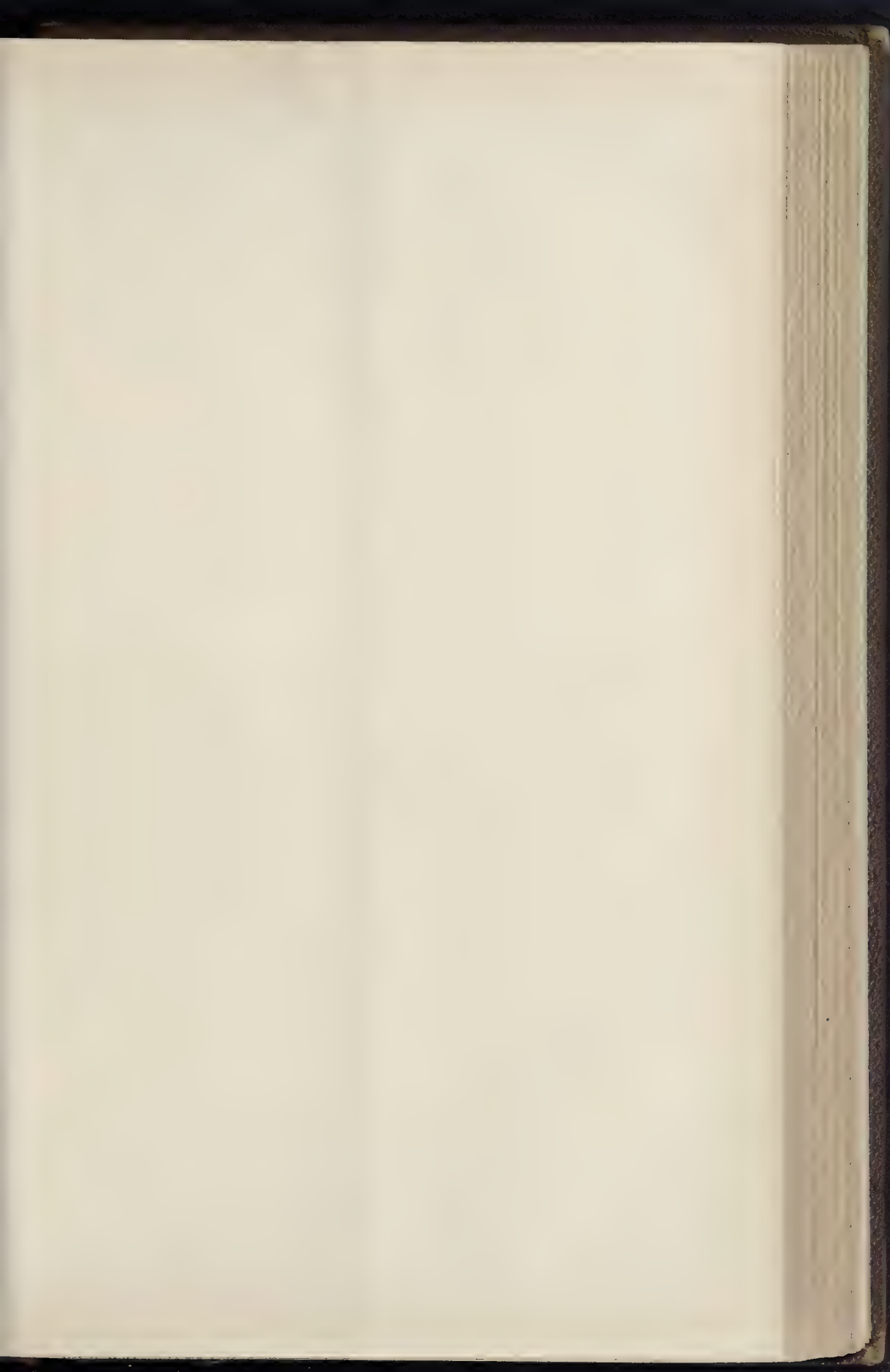
THE SWISS HOTEL  
Old Compton St. w

— W. H. Williams & Hopson —  
— ARCHITECTS —

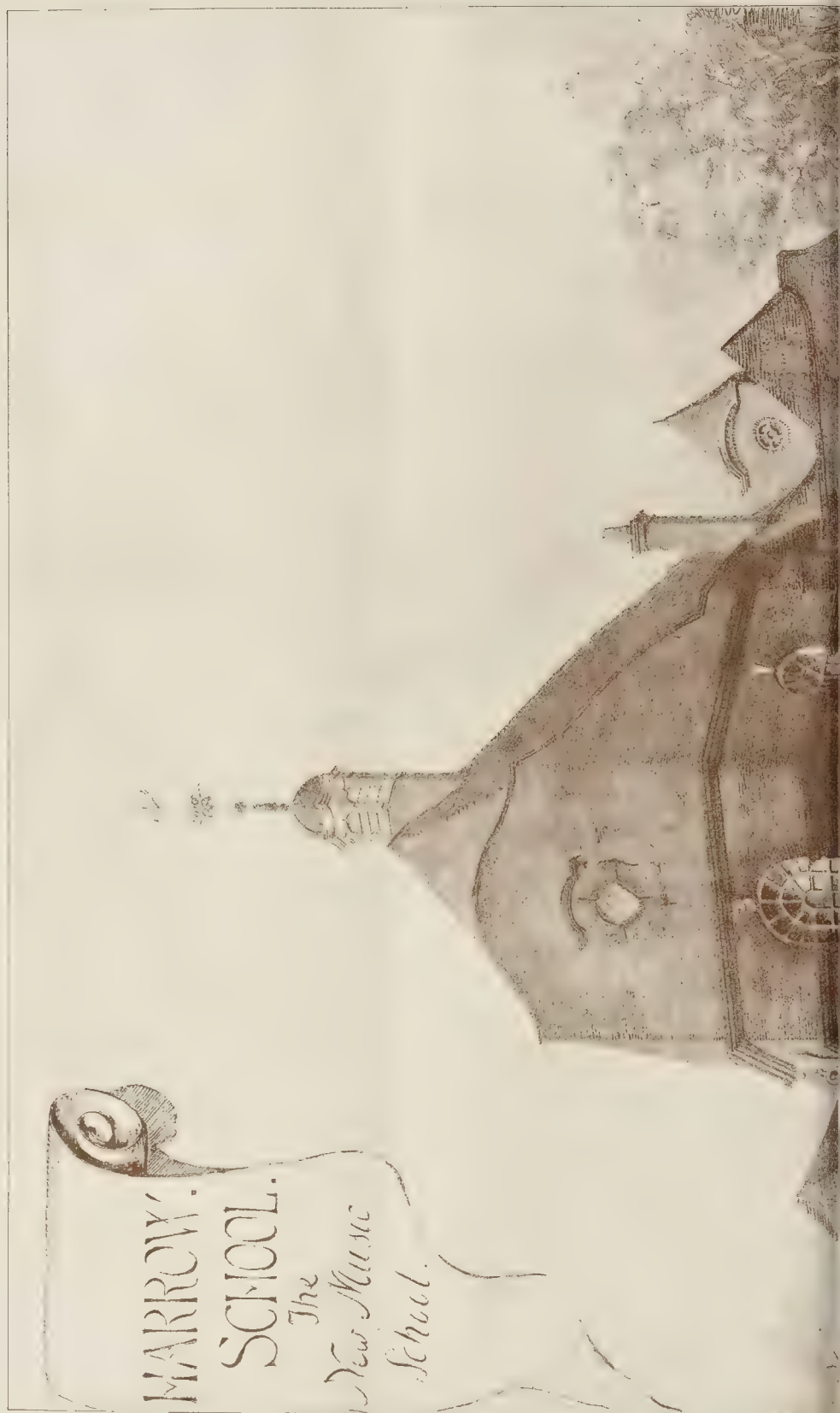








THE BUILDER. OCTOBER 25, 1930.







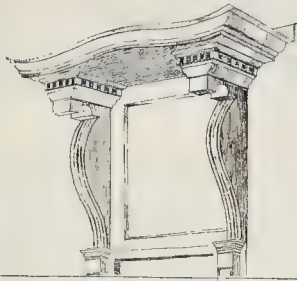
Royal Academy Exhibition, 1860.





## Sketches of Old Domestic Work at Leicester:

Silver Street



High Street



High Street



St Nicholas Street

Highcross Street  
(now demolished)

Old Town Hall.

at Northborough  
near Leicester

## Correspondence.

To the Editor of THE BUILDER.

## THE COMPETITION FOR WHITEFIELD'S TABERNACLE.

SIR,—A good deal has been written with reference to my award of the premiums in this competition, to the general effect that the first premium ought to have been given to "Lux Mundi," and that no premium ought to have been given to "Winged Heart."

I sincerely admired the artistic and practical merits of Mr. Brydon's design, "Lux Mundi," but its cost and its acoustic qualities stood in its way. Of every design which on other grounds it seemed might possibly deserve a premium, a careful approximate estimate was made; and, though I could recognise that Mr. Brydon had striven to keep down cost, I could not see my way to report that his design could be carried out within, or even very near, the limit of cost fixed.

Further, I did not consider that a dome of the size and height proposed was a suitable or safe ceiling for a large public place where clear hearing and easy speaking were of the first importance.

The objection to "Winged Heart" has been raised that it occupies a longer frontage to Tottenham-court-road than is figured on the lithographed plan issued to competitors; and when I discovered this fact I had to consider the position of this design and another which was similarly drawn carefully. The lithographed plan, on the face of it, proclaims itself incorrect; for, as you were good enough yourself to point out, the dimensions figured on the east frontage and those figured on the west frontage differ by 6 ft. though there is no indication of any oblique boundary north or south. These two competitors appeared to be the only two who had cleared up the difficulty, and it did not seem reasonable, or required by any principle of equity, to exclude them for fitting their design to the site it was intended to occupy. Further, looking at the nature of the considerations which the decision would have to turn upon, it did not appear to me that either of them gained any advantage over the other competitors by reason of the difference in dimension of the east frontage, and there was nothing to suggest any suspicion of bad faith. I do not think that any one of my critics, under the circum-

stances, would have felt it right to act differently.

T. ROGER SMITH.

## THE ARTS AND CRAFTS EXHIBITION.

SIR,—I have read with great interest your article on the "Arts and Crafts" Exhibition, and your warning as to the introduction of the "shop element" is one the committee might certainly take to heart if they wish to make their society a success.

May I offer a suggestion which I think would increase the attendance of visitors, which you say is rather small? I understand the Society wish to bring about a closer union between workman and artist. If so, why not give the former a chance of viewing the works of art exhibited? But that cannot be if they close at six. I know several workmen who, like myself, would be glad to go and learn something, but we cannot afford to lose five hours ever for the sake of learning a little. If it were open till eight, or even later, on Saturday, I am sure hundreds would come who cannot get away before six. I would guarantee to bring half a dozen men myself. And why not open it on Sunday? Surely Mr. Morris or Mr. Crane would not object to that.

A YOUNG CABINETMAKER.  
\* \* We understood that the Committee of the Arts and Crafts Exhibition intended to open the Exhibition on Monday evenings for free admission by tickets which would be allotted on application. Our correspondent had better address a note to the Secretary on the subject.

## PYROGRANITE.

SIR,—I thank you for your comment in the *Builder* for the 11th inst. It has had the effect of directing public attention to this new system of dealing with the clays of the United Kingdom. As I am asked to exhibit these products longer than I did at Westminster Town Hall last week, so that more architects and builders may have the opportunity of seeing them, permit me to inform your readers that a room has been appropriated for this purpose at Charing-cross Hotel, and I shall be most pleased to give my card to view these specimens on application here; or they can be seen on application to Mr. C. Burke, at the Charing-cross Hotel.

T. FREEMAN.

Lane End Works, 200, Phoenix-street, N.W.

TRADE DINNER.—The workpeople and clerical staff of Mr. Andrew Potter, waterproof and sacking manufacturer, Melbourne Works, Wolverhampton, numbering between 400 and 500 persons, recently took their annual "banquet" to Bridgenorth. Various places of interest in the neighbourhood were visited.

Thompson, "partly erected in 1586," and was used for the transaction of the business of the police department prior to the erection of the new municipal buildings. It is still in the hands of the Corporation, and is now used as the old Town Library and for meetings of charitable and other societies, and contains many interesting books and relics of different kinds.

The Chimney-piece in the Mayor's parlour (see lithograph plate) is a fine specimen of the woodwork of its time, the carved date on the right-hand side being 1637. The scroll work is mass painted and gilded, and is in a good state of repair.

A. DALE.

## SWISS HOTEL, OLD COMPTON-STREET, W.

THIS ancient house, lately pulled down and now rebuilt for Mr. C. Giattli, was one of the oldest and best known "inns" in the west of London.

The new hotel is built with ordinary stocks, except the front elevation, which is of Leicester pressed red bricks and flesh-coloured terracotta, Schutte's patent lime being used throughout.

The elevation of the ground-floor is entirely of glazed faience ware in five tints.

The whole of the brick and wood carving, modelling, tile dados, &c., were executed by Messrs. Reid & Co., of Berners-street, W.

The builder is Mr. E. A. Roome, of Clapton, E., and the cost, including fittings, is 5,170l.

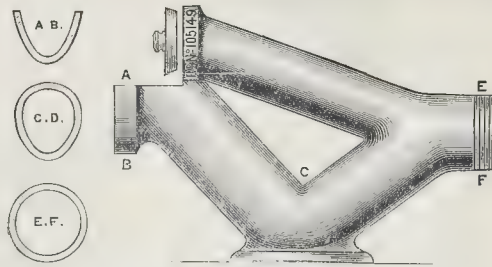
A novel and somewhat interesting feature in the rebuilding arose from the fact that the whole of the eastern party-wall comes over the centre of the passage leading to the churchyard in the rear, and had to be carried on specially-designed girders.

The drawing from which the illustration is taken was exhibited at the Royal Academy this year.

The architects are Messrs. W. A. Williams & Hopton, of London and Bromley, Kent.

## COMPETITIONS.

BATHS AND WASH-HOUSES FOR ISLINGTON.—We are informed that the competition for the baths and wash-houses for St. Mary's parish, Islington, has been settled by the arbitrators awarding the first premium to Mr. A. Hessel Tiltman, of Torrington-square, W.C.



The Improved "Kenon" Trap.

## SOME SANITARY SPECIALTIES.

MESSRS. THOMAS CRAPPER & Co., of Chelsea, send us their new catalogue of sanitary specialties, some of which we have had the opportunity of inspecting. Their patent disconnecting "Kenon" trap, for use in deep inspection-chambers, we noticed on a previous occasion. They have now brought out an improved form of the same trap, in which, as will be seen by the accompanying illustration, the flow of sewage is quickened by the conduit or passage of the trap being made egg-shaped in section, instead of circular.

The catalogue includes examples of some improved air-tight frames and covers for man-holes and inspection-chambers, and covers for frames to allow of the ready inspection of drain-channels in situations where large inspection-chambers are not required. No. 510 in the catalogue shows a very effective form of automatic flush-tank, judging from experiments with it which we have witnessed. Nos. 511, 512, 513, and 514 illustrate different forms of a new grease-trap, which is automatically flushed at desired intervals. Grease passing into the trap becomes congealed by the cold water, and is retained until the flush-tank discharges and carries away the floating film of fat. This arrangement, no doubt, prevents the necessity for periodical cleaning-out which exists with most grease-traps; but, on the other hand, objections may be urged against sending fat into the sewers.

No. 519 in the catalogue shows a new form of siphon water-waste preventer for water-closets, which requires no brackets for fixing, and no unions or sockets are left in sight, although they can be easily got at when necessary. It consists essentially, in fact, of a segmental-shaped, moulded, cast-iron tank and cover, in lieu of the usual unsightly square-shaped affair.

The catalogue also includes some very good forms of water-closet, and an improved self-rising closet-seat, weighted with fixed leaden weights, which are concealed from view.

## OBITUARY.

MR. THOMAS URMSON.—It is announced that Mr. Thomas Urmson, builder and contractor, died on the 15th inst., in his sixty-seventh year, at his residence in Cressington-park, Liverpool. The deceased gentleman for many years past was in an extensive way of business. He was born at Hutton, near Daresbury, and after having served his time as a joiner he worked at his trade in the locality. While still a young man he went to Liverpool, and obtained employment with several firms. Some thirty-five years ago he commenced business as a builder, and took a yard near Mansfield-street, in St. Anne-street, Liverpool, after which he removed to more extensive premises in Soho-street, where the business has been carried on ever since.

MR. A. B. MULLET.—A Dalsiel cable message to the *Galignani Messenger* states that Mr. A. B. Mullett, formerly Supervising Architect of the U.S. Treasury Department, shot himself in Washington on Monday afternoon, during a temporary aberration of mind, and he died the same evening. He was the designer of a large number of the Government buildings in the leading cities of the States, and also of the War, State, and Navy buildings in Washington. In consequence of the stereotyped character of his work, the buildings he designed are said to be in the "Mullett" style (according to the telegram).

## SURVEYORSHIPS.

MARKET BOSWORTH RURAL SANITARY AUTHORITY.—We learn that Mr. Harry W. Taylor, of Birmingham, has been appointed Sanitary Inspector and Surveyor to the Market Bosworth Rural Sanitary Authority. He is at present Engineer to the Sewerage Works at Rathy, for the Bosworth Board.

## The Student's Column.

## HOT-WATER SUPPLY.—XVII.

## IMPROVED AND OTHER SYSTEMS (continued).

ANOTHER question intimately connected with this subject is whether the cold supply service of the cylinder system could by any means be shortened by taking it into the secondary return or elsewhere, and the study of the results made visible in a glass apparatus has gone far towards settling the question.

There has always been the objection of having to provide three pipes (rising main, return, and cold supply) in a complete cylinder apparatus, against the customary two of the tank system, and this has led to various attempts being made to make one pipe answer the double purpose of secondary return and cold supply to the cylinder, but the majority of these attempts have been failures, or else so limited in their success as to be held in suspicion as unreliable.

If we take the cold supply direct into the secondary return, as fig. 37, we shall have the

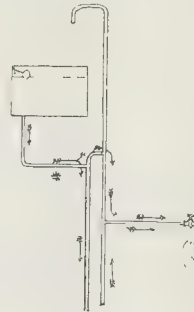


FIG 37

worst possible results, especially with the taps at the top of the house, as, immediately the taps are opened, a flow of cold water will set in direct from the cistern to the tap, as indicated by the arrows, and in this instance the friction element will be against the good results, as considerably less resistance of this character will be felt by the water that passes, as just explained, than by the proportion of the water that comes up the rising main, as this latter quantity has to pass right down the house and through the cylinder before it reaches the tap. An attempt was made to prevent the cold water passing to the tap by putting a deep dip in the pipe where marked \* on the illustration, but this had no good effect; in fact, the suggestion was somewhat absurd.

The only means at present known of overcoming the difficulty that is worthy of recommendation, is to insert a "stop-back" valve in the circulation. These valves are made expressly to regulate a flow of water so that it may travel freely in one direction, but should from any cause attempt to travel the opposite way it is instantly checked. This valve is by no means a modern idea, as it is used in various forms for different purposes, particularly in sewage work, &c., but its application to hot-water work is somewhat recent and by no means general yet.

Fig. 38 shows in section a valve of this sort, of simple construction, and the only particular care needed in its manufacture is to have the

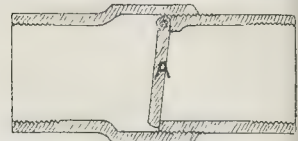


FIG. 38

flap A loosely hinged or jointed. In action the flow of water in one direction lifts the flap readily, but in the other direction it tends to close the flap tight. (The flap shuts on to a turned surface so that it is nearly watertight.)

In fixing one of these valves it should be placed anywhere in a horizontal position between the point where the cold supply enters the return pipe and the point where the return is branched from the rising main, as fig. 39, so that when

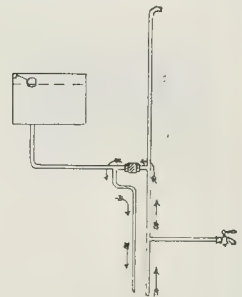


FIG. 39.

the water is circulating it passes the valve, as indicated by the arrows, but when a tap is opened the valve is closed by the approach of the cold water from the direction of the cold-water cistern, and the whole of the water drawn has, perforce, to come up the rising main from the cylinder, while the corresponding volume of cold water passes down the secondary return.

This arrangement answers very well, and under ordinary circumstances is reliable, as the valve has had a fair trial and no failures have been recorded; they have the advantage, too, of causing little trouble should they get out of order; as, supposing the valve got stuck shut, it would only convert the apparatus into one that has a single rising main not returned, and, provided a "connector" is inserted next to the valve, it could be easily taken out for inspection if needed. There are three of these valves that have been in constant use and under the

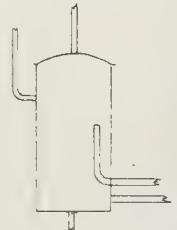


FIG. 40.

writer's notice the last four years, and none of these have ever required the least attention, for the only thing that could very well interfere with their free working is "fur," which, however, shows itself but little up in this high position; and the constant flapping of the valve (for it keeps up a perpetual movement while the water is circulating) prevents its becoming fixed from this cause.

When the secondary return is made to answer this twofold purpose, it should not be connected



gh up in the cylinder, but near or into the  
atom as a cold supply.

It has been shown in some of the preceding  
ustrations that the primary flow-pipe from  
a boiler is connected into the cylinder about  
no inches up, and that there is a piece of pipe  
tached by an elbow carried up inside so that  
is flow really terminates about half the way  
s, as fig. 40. This may appear to many to be  
ther an unnecessary and peculiar arrange-  
ment, which it really is, as the same purpose  
ill be attained by letting the flow enter the  
le of the cylinder half the way up, and so  
ake the stand-pipe inside unnecessary, as  
fig. 41.

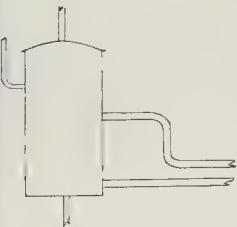


FIG 41

The cost of fitting in either instance is about  
the same, but by the latter method a benefit is  
perceived by lessened trouble, as should the  
finder have a removable top and no manlid,  
will be found a most difficult task to attach  
elbow and pipe inside, particularly if the  
finder is a high one. It matters not where  
cylinder is purchased, if flanges for flow and  
turn are ordered they will be put both within  
in. of the bottom. Yet the poorest of hot-  
ter fitters know that a primary flow-pipe  
could always terminate at least half way up  
reservoir of either description. Therefore, if  
re is taken to order sufficient flanges to be  
fixed to the cylinder in their proper places, a  
aving in cost may be effected also, as there  
then no need for a manlid or removable top,  
d this makes an average difference of about  
ght shillings net (in the price of the reser-  
oir), an economy worth practising for the little  
ouble it entails.

There can occasionally be found an apparatus  
th the cylinder connected up, as at fig. 42, a

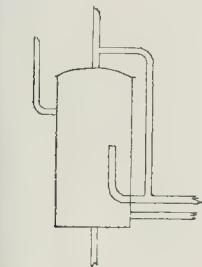


FIG 42

ethod that can by no means be condemned,  
r it answers a useful purpose in giving hot-  
ter in the upper part of the apparatus a little  
icker after first lighting the fire, as there is (as  
ill be seen) a clear way for some of the  
ter to circulate from the primary to the  
ondary flow without passing through the  
inder. In practice it is found that by this  
thod one-half passes each way, but, of course,  
half that passes into the cylinder loses its  
t almost instantly until the apparatus (or  
per part of the cylinder) is charged with hot-  
ter, consequently water of a high tempera-  
e will be obtained in the upper pipes quicker  
than arrangement, but it will only be in  
all quantity.

**ELECTRIC LIGHTING AT LEWES.**—At a largely  
ended meeting of Lewes ratepayers, held on the  
h inst., under the presidency of the Mayor, it  
s decided by an overwhelming majority to adopt  
strictly for street lighting.

GENERAL BUILDING NEWS.

**THE NEW CALEDONIAN RAILWAY STATION AT  
EDINBURGH.**—An Edinburgh evening paper (the  
*Dispatch*) of the 10th inst. published a view and  
description of the elevations to Princes-street and  
the Lothian-road of the new station which the Caledonian  
Railway have commenced to build at the  
west end of Princes-street, to take the place of the  
present wooden sheds. In consequence of the  
necessity for a great increase in the length of the  
station, the entrance front has been brought out to  
the line of the present gate pillars, so that the  
space in front of the present station will be enclosed  
within the new building. The entrance to  
the station is by three large archways towards  
Princes-street. The one next Lothian-road is for  
cabs, and the other two for foot passengers. On  
entering the station cabs will pass along an arcade  
parallel to the Lothian-road—there being a length  
of 105 ft. for setting down passengers. The station  
platform is separated from this arcade by an inner  
wall pierced by four arches. After setting down  
their passengers, the cabs will proceed southwards  
along a continuation of the arcade and debouch  
upon Lothian-road at a point almost opposite Castle-  
terrace. As regards the elevation, owing to the  
shape of the ground which the station will occupy,  
the enclosing walls will be slightly curved, and the  
distance between them being greater at one end  
than at another, there was no alternative but to  
adopt a series of transverse roofs with the gable-  
ends showing towards Lothian-road. As seen from  
the Castle, or other elevated standpoint, the series  
of parallel girder roofs will be much less obtrusive  
than would one great semi-circular roof of glass  
and iron. From Princes-street also the roof  
adopted will be much less conspicuous, and will be  
masked by a pavilion or mansard roof over the  
principal entrance. The architects are Messrs.  
Kinneir & Peddie.

**ST. AIDAN'S CHURCH, HARTLEPOOL.**—The Bishop  
of Durham, on the 11th inst., consecrated the new  
church of St. Aidan, Hartlepool. The general  
architectural character of the fabric is Early  
English, and on plan comprises nave, aisles, and  
chancel, with organ-chamber on the north, and  
choir and clergy vestries on the south side of the  
chancel. A tower with spire is to be built over the  
organ-chamber at some future date; this portion is  
at present covered with a temporary roof. The  
nave arcade consists of five bays, with arches  
springing from circular piers; the clearstory above  
is lighted by a range of three-light windows. The  
west end is pierced by a large traceried window,  
with single lights on either side. The chancel is  
divided from the nave by a low parapet wall, with a  
moulded arch above springing from corbels. The  
east end is lighted by three lofty windows, with  
deeply splayed jambs and richly-moulded arches.  
The chancel fittings have been designed on  
a very complete scale; on either side are  
the canopied choir and priests' stalls, with the  
organ-case rising above on the north side.  
The total length of the church is 118 ft., and width  
52 ft. The whole of the internal fittings and roofs  
are of unvarnished pine; the walls, both  
inside and out, are faced with red brick, with dress-  
ings of Whitby stone. The church is heated by a  
hot-water apparatus, supplied by Messrs. Dinning &  
Cooke, of Newcastle. The contractors for the  
mason and bricklayers' work were Messrs. W. Scott  
& Son, of Sunderland, and for the carpenter and  
joiners' work Messrs. G. Clark & Co., of West  
Hartlepool. Mr. T. Adamson, of Sunderland,  
acted as clerk of the works. The church has  
been designed by Mr. J. H. Morton, F.R.I.B.A., of  
South Shields.

**NEW COAL HOIST AT THE ALEXANDRA DOCK,  
HULL.**—Contemporaneously with the great increase  
which has taken place in the coal trade of this port  
with continental and more distant centres, the  
directors of the Hull and Barnsley Railway and  
Dock Company have just had completed for them  
at their Alexandra Dock a new coal hoist, which  
commenced working for the first time on the 15th  
inst. This addition (says the *Hull Daily News*)  
constitutes the third hoist now studding the north  
quay of the dock, and it is certainly not exaggera-  
ting to state that Hull never before possessed such  
facilities for the prompt shipment of coal. The coal  
trade at the Alexandra Dock has increased so  
rapidly that a third hoist was felt to be absolutely  
necessary; but to erect the new one on the quay  
between the two already in use would have nega-  
tived its utility, as there would not have been suffi-  
cient space between each to enable three large  
steamers to take in coal simultaneously. To get  
over this difficulty it was decided to construct a  
timber jetty, projecting from the dock wall in the  
shape of a T, to which a third vessel could be  
moored, and the new hoist erected thereon. The  
length of this new jetty was to be 150 ft., and its  
width 24 ft. 6 in., with dolphins at each end.  
Messrs. Turner & Sangwin, contractors, were  
entrusted with this difficult portion of the under-  
taking, and likewise the erection of the timber  
viaduct leading therefrom. As is well known, the  
Alexandra Dock is of great depth, and to get a sub-  
stantial foundation for the new structure piles of  
an extraordinary length have had to be obtained  
specially for the work. No fewer than 130 piles  
were 62 ft. long, and from 15 in. to 16 in. square,

and very great care had to be exercised in driving  
these big timbers into their beds. Altogether about  
250 piles have been used in the structure, Memel  
timber and American elm being principally brought  
into requisition. A very strong and substantial  
jetty was thus obtained for the hoist. The height  
of the iron frame-work of this new hoist is 62 ft.  
above the quay, the lift of the cradle being 45 ft.  
from its quayside level. This high lift will enable the  
largest steamships to take coals direct into their  
bunkers. The hoist is actuated by hydraulic  
pressure from the existing hydraulic mains,  
and in order to supplement the power an  
additional set of engines has been provided by  
Sir Wm. Armstrong & Co., of Newcastle. The  
plans for the jetty and general work connected  
with the hoist were designed by Mr. R. Pawley,  
the Company's engineer, who has also superin-  
tended the work. The hydraulic portion has  
been under the supervision of Mr. Stirling, the  
locomotive engineer of the company. The contract  
for the jetty and the elevated timber viaduct leading  
from it was let to Messrs. Turner & Sangwin; the  
iron framing and hydraulic work to Sir W.  
Armstrong & Co., Newcastle; and the girder work  
of the high level line to Messrs. John Butler & Co.,  
of Stanningley, Leeds.

**NEW ROMAN CATHOLIC CHURCH AT CAMBRIDGE.**  
The new Church of Our Lady and the English  
Martyrs, Cambridge, was consecrated on the 15th  
inst. The first stone of the church was laid on  
June 30, 1887, by the R.C. Bishop of Northampton.  
The architects are Messrs. Dunn, Hansom, & Dunn,  
of Newcastle-on-Tyne, and the contractors have  
been Messrs. Rattee & Kett, of Cambridge, the  
clerk of the works being Mr. Josiah Bowden, of  
Bristol. The glass has been executed by the firms  
of Messrs. Lavers and Westlake, and Messrs.  
Hardman & Co. The woodwork is the work  
of various artists. The sanctuary screens and pulpit  
are the work of Mr. Ralph Hedley, of Newcastle.  
The baldachin is by Mr. Boulton, of Cheltenham;  
the benches are by Messrs. Rattee & Kett; the  
organ-case by Mr. Lewis, of Bristol. The organ  
itself has been built by Messrs. Abbott & Smith, of  
Leeds. The church from the foundation to the  
plinth is of Casterton stone; the plinth is of  
Ancaster stone; and the rest is from Combedown.  
The stone used for the interior is Farleighdown.  
The shafts are of Plymouth marble, with the excep-  
tion of those in the ante-chapel, which are of New-  
bigin stone. The Bath-stone work was executed  
in Bath, by Mr. Joseph Bladwell, and sent to Cam-  
bridge ready for fixing. The carving on the exterior  
of the buildings is by Mr. James Owens, of Preston.  
The statues at the tower and west entrances and in  
the interior are by Mr. Boulton, also the altars and  
the font.

**MISSION CHURCH, BRAMALL, NEAR STOCKPORT.**—  
On the 4th inst. the Bishop of Chester consecrated  
the new mission church of St. Michael and All  
Angels at Bramall, in the parish of St. Thomas's,  
Stockport. The building, which is simple in its  
ecclesiastical character, has cost about 1,000*l.*,  
towards which a large proportion has already been  
realised. It has been constructed from the designs  
of Mr. J. Stevens, F.R.I.B.A., of Manchester. In  
the recessed niche that occurs near the apex of the  
gable, a boldly carved statue, in the round, about  
5 ft. high, has been placed. This represents  
St. Michael the Archangel, and is carved in hard  
heart of English oak. This is by Mr. Harry Hems,  
of Exeter.

**NEW MEAT MARKET FOR GLASGOW.**—A new  
dead meat market, erected by the Glasgow Meat  
Market Company at a cost of fully £2,500, has just  
been opened. The market is constructed externally  
in courses of polished ashlar, and the whole  
interior is faced with white enamelled bricks.  
What is thought to be thorough provision has been  
made for ventilation, and there is hanging space  
for 100 bullocks, 300 sheep, and 140 quarters of  
meat. The architects of the building are Messrs. F.  
Burnet & Boston, Glasgow.

**NEW HEBREW CLUB AT BIRMINGHAM.**—Plans,  
&c., have been prepared for a new Hebrew Club-  
house which it is contemplated to erect in Hol-  
loway-head. The building will be four stories in  
height, and will consist of care-taker's premises,  
wine cellars, refreshment bars, large and lofty  
assembly-room, billiard-room, card-rooms, and  
necessary lavatories, &c. The style adopted is  
described as a free treatment of English Gothic,  
ornamental brickwork, stone, terra-cotta, Minton's  
tiles, and other decorative features being introduced  
into the front elevation. Mr. J. Statham Davis, of  
Birmingham, is the architect.

SANITARY AND ENGINEERING NEWS.

**THE WAKEFIELD UNION RURAL SANITARY  
AUTHORITY** have resolved to petition the Local  
Government Board for powers to borrow on loan  
the following sums—viz., 1,850*l.* for the carrying  
out of a scheme of water-supply to the township of  
Crofton, 1,400*l.* for water-supply to the township  
of Walton, 1,500*l.* for the improvement of the  
existing water-supply to the township of Shillington,  
and 1,650*l.* for the construction of a main out-  
fall sewer for the drainage of the Common-lane dis-  
trict, in the township of East Ardsley. The plans  
and estimates for these works have been prepared by  
their engineer, Mr. Frank Massie, Assoc. M. Inst.-C.E.



**INSTITUTION OF MECHANICAL ENGINEERS.**—An ordinary general meeting of this Institution will be held on Wednesday evening, October 29, and Thursday evening, October 30, at 25, Great George-street, Westminster, by kind permission of the Council of the Institution of Civil Engineers. Among the papers to be read is one on "Tube-Framed Goods Wagons of light weight and large capacity, and their effect upon the Working Expenses of Railways," by Mr. M. R. Jeffers, of London. In connexion with this paper the members are invited to inspect one of the wagons which will be on view at any time during daylight on October 29 and 30, at the Victoria Passenger Station of the London, Chatham, and Dover Railway, where it will be standing in the siding behind the main arrival platform, by kind permission of the Railway Company. We mention this because we have on one or two occasions referred in, "Notes" to these wagons.

**CAMBRIDGE SEWERAGE WORKS.**—Mr. Mansergh, M.Inst.C.E., who was called in by the Urban Sanitary Authority of Cambridge to advise them on the respective merits of two schemes which have been submitted to them for the sewerage of the town, viz., one by Mr. Anson, and the other by Mr. Wood, has issued his report. After describing the salient features of the two schemes, Mr. Mansergh proceeds to reply to a series of questions put to him, and in the course of doing so criticises the two schemes, especially Mr. Anson's. He says that Mr. Wood's scheme is laid down generally upon the right lines, but it would not be correct to say that they have been strictly adhered to. As, however, by some alterations in detail the general design can be elaborated into consistency and thorough efficiency, he approves it rather than the other. With regard to the correctness of the estimates, Mr. Mansergh says he should increase Mr. Anson's estimate from 83,500l. to 106,400l. Mr. Wood's 82,315l. 14s. 7d. he should make 97,681l. 12s. Neither of these totals includes anything for the purchase and preparation of land. Mr. Mansergh says he has no hesitation in stating his preference for the general ideas embodied in Mr. Wood's scheme over Mr. Anson's. As to the treatment of the sewage, Mr. Mansergh observes that in the two schemes submitted to him two different methods of treatment are recommended. Mr. Anson proposes the precipitation of the solids by chemical means in tanks, and the further purification of the clarified liquid in the process of downward intermittent filtration upon fifty acres of land. This combined process, if judiciously and honestly worked, would insure satisfactory results in the production of an effluent good enough to go into the Cam. The sludge difficulty would also be reduced to a minimum by the use of filter-presses; but he is of opinion that it is not desirable to establish works of this character within the town and so close to an important public road. Mr. Wood recommends the utilisation of the sewage upon the land by the well-known method of broad irrigation, and Mr. Mansergh was quite disposed to agree with him. It was thirty years since he (Mr. Mansergh) laid out the first sewage-farm in England, in conjunction with Mr. McKie, and since then he had been connected with over a score of others, and he had no reason to alter his opinion that the process of broad irrigation on suitable land was the most satisfactory.

**RICHMOND SEWERAGE WORKS.**—On the 4th inst., Mr. Charles Bart, Chairman of the Richmond Main Sewerage Board, laid the memorials on the state of the sewerage works at Mortlake, which are now approaching completion. Mr. J. C. Mellis is the engineer. Messrs. Webster, and Messrs. Nowell & Robson, are the contractors. The total cost of the works will be upwards of 100,000l.

**THE SEWERAGE OF GRAYS.** The Local Board of Grays Thurrock, in Essex, lately advertised an open competition for the best scheme for the sewerage and sewage disposal of the town. The present population is 12,000, and it is rapidly increasing. The Local Board have selected a scheme prepared by Mr. W. H. Radford, C.E., of Nottingham. The pumping-station will be placed on the east side of the Marsh-road, and the whole of the sewage will be brought down to the site of the sewage works by 8½ miles of pipe-sewers. There will only be one pumping-station; and with a storage-tank for the reception of the night sewage, the pumps will only be required to be worked by day, unless there is an exceptional storm. The pumping-machinery is in duplicate, and it will raise 120,000 gallons per hour. The sewage will be pumped to a lift of 97 ft. to the Lodge Farm, where it will be purified by broad irrigation on 93 acres of light, dry land. Ten acres will be laid out as a special intermittent filtration area. All surplus storm-waters will flow into the Thames by gravitation at low water, and will be pumped into the Thames at high water, and will be automatic flushing arrangements are provided. A separate system of five miles of pipe-sewers for road surface-water is proposed, which will be stored in open back-waters during high water, and turned into the Thames by gravitation at low water. The total cost of the engineering works will be 19,400l.

**THE MAIN ROADS OF CARLISLE.**—On the 13th and 14th inst., Mr. T. Codrington, M.Inst.C.E., one of the Inspectors of the Local Government Board,

held an inquiry at Carlisle with reference to the application of the Carlisle Town Council to the County Council to have certain roads within the city declared main roads within the meaning of the Highways Act, 1878, and the Local Government Act, 1888, in order that the County Council of Cumberland may be called upon to contribute towards the cost of the maintenance, repair, and reasonable improvement of such roads and streets as may already be main roads by operation of law, and such others as may be comprised in the declaration which the Local Government Board have been called upon to make. The case for the Corporation was heard, evidence being given by the City Surveyor, Mr. Howard Smith, and others. Mr. Martin, on opened the case for the County Council, and the evidence of the County Road Surveyor and members of the Highway Committee having been heard, the inquiry closed.

**PUBLIC IMPROVEMENTS AT SOUTHPORT.**—Colonel W. Marston Ducat, R.E., one of the Local Government Inspectors, attended at Southport Town-hall, on the 15th inst., for the purpose of holding an inquiry into an application by the Corporation for power to borrow the sum of 54,924l. for works of public improvement, namely, 37,074l. for improvement of marsh lands and foreshore, 9,500l. for completion of the Municipal Offices, 4,500l. towards cost of the erection of Barton-street bridge, 1,500l. for fire-engine purposes, 1,100l. for purposes in connection with museum, schools of science and art, and art gallery; 550l. for market purposes, and 300l. for laying parks. No opposition was raised to the application.

**PROPOSED TUNNEL BETWEEN IRELAND AND SCOTLAND.**—A public meeting, specially convened by the Mayor to consider a scheme for constructing a tunnel between Ireland and Scotland, was held in Belfast on the 17th inst. Sir John Hawkshaw, of the Northern Railway, submitted a scheme in which he proposed a tunnel, thirty-three miles long, between Island Magee (co. Antrim) and Wigtonshire, the greatest depth being 500 ft., and the steepest gradient 1 in 75. Mr. Barton, continuing, said the scheme had the support of Sir Douglas Fox, engineer of the Severn Tunnel; Sir Benjamin Baker, the Forth Bridge engineer; and Sir John Hawkshaw, of London. He estimated the total cost at 8,000,000l., and the tunnel could be completed in ten or twelve years. The meeting passed resolutions recognising the great national importance of the scheme, urging the Government to render financial assistance, and appointing the Duke of Abercorn, Lord Belmore, Lord Arthur Hill, and twelve other gentlemen, a committee to consider and report upon the whole question.

**DEEPENING OF THE RIVER DEE.**—At the Chester Town Hall on the 6th inst. a quarterly meeting of the River Dee Conservancy Board was held, when the report of the acting conservator (Mr. H. E. Taylor, C.E.) was read. It stated that the new training walls from the north and south sides below Connah's Quay, had been built, the former to a length of 135 yards and the latter 225 yards. The result had exceeded his expectations. The channel was so much improved in the short time that the statutory depth was established to the wharves of the Vrexham, Mold, and Connah's Quay Railway Company. For maintaining and furthering that state of things he recommended that the north wall be extended 100 yards, and that the south one be pushed on north parallel to the old Causeway, with the channel gradually opening as it proceeded seaward. These works, the extension of the main training walls towards Flint, and the walls in the upper reach could be proceeded with tentatively, and at a cost not exceeding an outlay of 50l. per week. To seize the opportunity, now presenting itself, of deepening the upper river at a minimum of cost, he would advise the provision of three craft, fitted with steam power, for dredging works. He estimated the cost of the whole at 2,300l., and of working them at 18l. 18s. per week. A motion to adopt the report of the Works Committee was carried.

**NEW CANAL FOR SOUTH YORKSHIRE.**—The Aire and Calder Navigation proprietors are promoting in the next session of Parliament, a Bill authorising the construction of a new canal. The proposed canal, to be known as the Goole and South Yorkshire Junction Canal, will be a connecting link between the Aire and Calder Navigation and the South Yorkshire Navigation from Sheffield to the Trent, for the deepening of which an Act was obtained in 1889. It will start from the South Yorkshire Canal at Kirk Bramwith Locks, about eight miles from Doncaster, to Sykehouse Bridge on the Aire and Calder Navigation, seven miles above Goole. It will cross by an aqueduct the River Don and the River Went, but the intervening country is flat and entirely agricultural, and it is calculated the work can be completed in two years. The canal is to have a breadth of 75 ft. and a depth of 10 ft., and it will be five and a-half miles long, with only one lock.

**MATLOCK BRIDGE WATERWORKS.**—We understand that the Waterworks Company at Matlock Bridge have called in Mr. W. H. Radford, C.E., of Nottingham, to report as to whether it is advisable to increase the present supply of water; and as to which of the springs in the neighbourhood would form the best source of additional supply.

## FOREIGN AND COLONIAL.

**FRANCE.**—The work of restoration of the Tour de la Grosse Horloge at Rouen has been commenced. The cost of the work, 58,000 francs, is to be borne partly by the town and partly by the State. It is to be hoped the 58,000 francs, no very large sum, fortunately, will be applied with moderation and for necessary repair only.—The town of Laval is about to build a museum for which the Minister of Public Instruction has promised to give a certain number of paintings and sculptures purchased by the State.—At Niederbrunn, in Alsace-Lorraine, a monument is to be erected to commemorate the first French soldier who fell in the Franco-German war.—The Société des Amis de l'Art, of Bordeaux, has organised a retrospective exhibition of illustrated advertisements. The collection extends over forty years, and shows the great progress which has been made in the artistic character of such work during this period.—The Parisian journals have been occupying themselves not without reason, about the lamentable state of dilapidation of the Château de Chenonceau, since its former owner, M. de Pelouse, was obliged to put it up for sale. The park is completely neglected, and allowed to run to waste, the château contains a collection of furniture, pictures, and bric-a-brac, the chambers of Diane of Poitiers and Catharine de Medicis, as well as the grand gallery restored by M. Touché some years ago, are going to ruin. The papers, in denouncing this neglect, demand that the State should purchase and preserve this fine example of Renaissance architecture.—A French ecclesiastic has discovered in Tunisia, of the plateau of the Jebel el Akrou, the remains of Carthaginian tombs, enclosing a great number of ornaments, &c.; among them painted vases, gold diadems, painted ostrich eggs (??), statuettes, and other objects in silver and bronze.—A narrow gauge line is to be established between the railway station at Rimogne (Ardennes) and the town of Floreffe. The line will be 1½ miles long, and will be a branch of the Chemin de fer de Namur to Liège.—A large establishment for the treatment of consumption has been opened at Vernet-Bains on Mont Carrion (Pyrenees Orientales). It has been constructed at the cost of the Comte de Burnay, a large landowner in the Department.—In accordance with a decision of the Municipal Council of Arras, the removal of the railway station, which was much too far from the town, is shortly to be carried out by the company of the Chemin-de-fer du Nord.—The company of the Chemin-de-fer de l'Ouest has in hand some new works intended to connect the lines to Versailles and St. Germain, an relieve the traffic, which is at present much congested. The works will include the widening of the Asnières and Courbevoie, which will be known as "Bécon-les-Bruyères."—In the Commune of Mureaux, near Meulan (Seine-et-Oise) some important remains of ancient building have been discovered, including a small square building with remains of coloured decoration in red, yellow, and blue, and a large hall with a vaulted ceiling. The excavations are under the conduct of Mr. Verneau, and are to be the subject of a report to the Académie des Inscriptions et Belles Lettres.—**BURNING OF AN HOTEL, SYRACUSE, NEW YORK.**—The Leland Hotel, at Syracuse, New York, a large building six stories high, was destroyed by fire on the 18th inst. Over 200 people were asleep in it at the time. The kitchen was the focus of the fire, and in half-an-hour the whole building was blazing. Most of the guests escaped in their night-dresses, many jumping from the windows. Some were rescued by ladders. Three guests and five servants were burnt to death and thirty persons were injured. The building was erected three years ago, and contained 140 bedrooms. Each of these was fitted with a rope fire-escape, besides other safety appliances. The fire burned with almost unparalleled rapidity, however, and prevented the adjustment of the escapes by those who wished to save themselves by that means. This clearly shows of what little use fire-escapes are unless they are permanently fixed. If the escapes could be fixed ready for use, so that people could not move them, they would be always there, and consequently there would be no necessity for adjustment at the critical moment.—**BERLIN.**—The Lening station recently unveiled by Professor Otto Lessing (a descendant of the critic), is in fine white marble, and placed on a pedestal of red Swedish granite. It is local much admired, and regarded as a masterpiece. As usual, the erection of a new monument in the precincts of the damp Thiergarten again gives rise to animated technical discussions in the papers as to the best means of preserving statues from the inclemency of the winters. At present one finds the marbles of the capital encased in so much soot as to be able to swing easily on its hinges with any extra support from rollers.—The municipal authorities have voted 500,000 marks, or near



000L towards the erection of a new museum building for the provincial collections of Brabant.

**OSDAM.**—The mausoleum of the deceased Emperor Frederick (see page 225, ante) is now complete. The ceremony of placing the coffin of the Emperor in its final position took place last week.

**OSWAY.**—The large new lunatic asylum at Osway, upon which work has been progressing for five years, is now nearly completed. It consists of six large and two small buildings, and affords room for 200 patients. The cost has been 35,000L. The building is granite, the style being modern. The architect is Herr Ebbel. —King Oscar, who has a great interest in, and has given large sums towards, the restoration of the Cathedral of Trondheim, paid a visit to it the other day, and was greatly struck with the beauty of the work executed. Nearly the entire interior had at an earlier period been whitewashed, according to the opinion which seems to have prevailed at one time in a great part of the world. All this has now been removed, and the original design restored. The interior is so far finished that at Christmas, probably, service will be held in the main structure, which has not been the case for four centuries. The floor is being laid with Norwegian marble. However, much work still remains upon the exterior, particularly the building of the great tower and smaller ones. —A new cement factory, the first of its kind in Norway, has been started on the Christiania fjord, where excellent raw material has been found. Some 600 men are employed, and the ovens are capable of turning out 80,000 barrels of cement a year. In addition, yellow and red bricks and tiles, of all kinds of fine clay being found in the neighbourhood. The out-turn is 4,000,000 bricks a year.

**ROME.**—The late Minister of Public Works, and now President of the Amalgamated Societies of Italian Architects and Civil Engineers, Alfredo D'Amico, died at his country-seat, near Ravenna, on the 19th inst. Highly respected as an architect, and an engineer, well known as a good statistician, he, the deceased, will not easily be forgotten by fellow-countrymen.

**MOSCOW.**—A national monument to the deceased Emperor Alexander II. is to find place inside the Kremlin, and according to a contemporary of the erection, will be a museum of relics of the Emperor. The monument is to be in the shape of a column, approved by the authorities, and is now exhibited for public view. The statue of the deceased monarch, enclosed on three sides by a system of colonnades, is to be placed on a gigantic pedestal, the interior of which is to be made accessible, and will be a museum of relics of the Emperor. The treatment of the monument is to be pyramidal; the pediment and colonnades being designed in various coloured marbles and granites, and the statue in bronze, the roofs of the colonnades being plated, and the interior surfaces of the vaulting also with mosaics.

**PARIS.**—The grand new Central Railway Station has now been seriously taken in hand by the Prussian and Saxon Ministries, and the evil of having a dozen separate stations in a town so much used in continental traffic, has some chance being done away with. If the somewhat cramped work fall into Saxon hands, a decade is to elapse before its completion.

**EGYPT.**—According to a correspondence in the press the other day, the pyramids of Gizeh being used as a quarry for building-stone by the Khedive, who are carrying away large blocks from the lower courses of the two large pyramids. It is stated that this is being done with the sanction of the Egyptian Government; but this seems hardly probable.

**BUILDING MATERIALS IN TANGIER.**—The British Consul at Tangier, in a recent report on the trade of that district, observes: "The increasing population of Tangier as a place of residence, and the consequent rapid growth of the European population, has given rise to a proportionately increased demand for building materials, of which 12,000L worth is imported during last year, principally consisting of bricks, cement, deals, gypsum, iron bars, tiles, &c. The main walls of the houses are of rough stones, but bricks are used in considerable quantities for inner walls, &c. In addition to these imported, which come chiefly from France, quantities of bricks of fairly good quality are now out from the kilns lately established here. The demand comes almost entirely from France, being generally preferred to the English, on account of its greater cheapness; but in the contract for the supply of this article to the Government works at Rabat, the stipulation was that well-known British mark should be furnished. Iron joists are of Belgian manufacture."

**ON OPENING FOR BRICKMAKING AT BAGDAD.**—According to a recent report of the British Consul at Bagdad on the trade of that district for 1889, there exists a good opening for brickmaking by some simple but scientific method. Al-Bad (population 116,000) is built of kiln-dried bricks. Stone is little used here, as it is in Mosul in the building, and although the tenacious clay of the river gives good material, its use is chiefly confined to huts and agricultural wallings along the

Tigris banks. There are about twenty-five kilns of various sizes, called *khras*, situated, dotted over the desert outside the city, but the out-turn is far short of the demand, half-built houses sometimes remaining so for long periods through want of bricks, and often in spring, owing to the inundations of the Euphrates and Tigris, brickmaking has to be suspended. Another great promoter of the demand for bricks is the absorption of water every winter by both bricks and mortar, owing to porousness. There is hardly a brick pathway, house, or wall in all Bagdad which does not call constantly for patching or rebuilding. The best bricks, of a chrome yellow, though good to look at, are very brittle, and many are broken in conveyance from the kilns on small donkeys, carrying not more than ten large bricks, 12 in. square, or twenty-five small bricks, 7 in. square. The usual prices at the kiln are:—Large bricks, 1L 16s. per 1,000; small bricks, 18s. per 1,000. Unskilled labour can be engaged to any extent at 9d. a day for men and 5d. for boys. Fuel is abundant; excellent wood (there not being coal) costs 1s. 6d. per cart, and the cheap desert scrub, burnt to fuel, the *khras*, is delivered at a little more than 6d. per ass-load.

MISCELLANEOUS.

**PISTON PUMPS v. CENTRIFUGAL PUMPS.**—Some comparative tests have been made recently in Germany which give interesting information as to the relative efficiencies of centrifugal pumps and piston pumps at fairly high lifts. The firm of Schaeffer, Lillanck, & Co., of Pfaffatt, use in their manufactory from 8,000 to 10,000 cubic metres of water every day. They draw 20 to 45 gallons per second from a well by means of two conjoined centrifugal pumps supplied by a Continental firm of engineers. The supply proving insufficient, piston pumping-engines were obtained from Messrs. Hathorn & Davey, of Leeds. These consisted of a horizontal compound receiver steam-engine, cylinders, 19 in. by 33 in. by 3 ft. stroke, and working four pumps in the well by bell-crank levers. The capacity of the pumps was about 90 gallons per second. As the two types of pumps were working under parallel conditions the opportunity was taken of making these tests. The water in both cases was drawn from the same source, and was raised to the same height and delivered by the same discharge-pipe. The centrifugal pumps had been erected in 1872, and are said to have worked until May, 1888, without needing repairs. The suction-pipe was 12 in. in diameter, and the delivery 10 in. The two conjoined pumps could deliver thirty-seven gallons per second through an average height of 39 ft. 6 in. at 620 revolutions per minute. The engine driving these pumps had a 21.65 in. cylinder with a stroke of 39.4 in. The pumps were geared about ten to one. With the centrifugal pumps the best result obtained was when running at 470 revolutions per minute, the lift being 35.51 ft. The efficiency then was 48.4, that being the percentage of engine-power available as useful work. With the plunger-pumps the best result was obtained, with a speed of engine of 13.3 revolutions per minute, the lift being 36.19 ft., when the efficiency was 73.8 per cent. The lowest duty obtained from the centrifugal pumps was on a trial, when 611 revolutions per minute were made, the lift being 35.71 ft., when the duty of the pumps was 34.72. The lowest efficiency for the plunger pumps was when running at 26.1 revolutions of the engines per minute, the lift being 36.6 ft., and the duty being 64.6 per cent. of the engine-power. In both types of pump the efficiency fell off as the speed of working was increased. The moral of the trials, of course, is not to use centrifugal pumps in positions for which they are unsuited. If the lift is sufficiently high to require pumps to be conjoined, so as to divide the lift, placing one above the other, the better practice for permanent work is to use other types. Fuller particulars of these trials may be found in the *Bulletin de la Société Industrielle de Mulhouse*, 1888, p. 661.

**THE ENGLISH IRON TRADE.**—The English iron market preserves the features of the previous week. It is still unsettled, and there is not much trade doing, the little buying that is going on being mostly confined to immediate wants. In those branches, however, where requirements must be met, such as shipbuilding material, for instance, business is of a steady character. Contrary to all expectations, Scotch warrants are still declining, although the difference since last week is not much, while makers do not sell any iron, for the simple reason that they have none to sell. Should the strike continue there will be a serious iron shortage in Connal's stores, and this will be an unmitigated blessing. Nidderhough pig-iron has lost a ton, and hematite iron in the North-west has gone back to a like extent. Elsewhere it cannot be said that pig-iron has given way much, the tone of the market being characterised by greater steadiness than could be expected under present circumstances. Although the demand for finished iron and steel is not very heavy, prices are firm. Tinplates have been very active this week, and values are still rising. Shipbuilders and engineers keep busy, but not much fresh work has been booked this week. —Iron.

**AUTOMATIC BRAKE FOR LIFTING JACK.**—Accidents are not by any means infrequent through workmen leaving go of the handle of a lifting-jack, when the load is on, either through carelessness or being overpowered by the weight being lifted; although it may be said that the man is always to blame for not putting the pawl in gear. It is, however, always distasteful to average human nature to take such precautions, and for this reason a device intended by the Alesian Society of Mechanical Construction, Grafenstaden, will be acceptable to those who have to do with the lifting of heavy weights. This is a simple automatic brake to be applied to rack-jacks, which is described as follows in a communication to the Institution of Civil Engineers:—A circular mass of cast-iron is mounted as a screw on a short steel shaft, the end of which is formed as a pinion, which gears with and is driven by the first wheel of the rack. The part of the shaft within the circular mass is out as a screw of long pitch, with several threads, and engages the interior of the circular mass, which is carried round with it. Under ordinary circumstances the mass is held in its proper place by means of a helical spring, but when the machine accidentally commences to run down at quick speed, the circular mass is induced by the screw overpowering the spring to slide onwise on the screw and come into frictional contact with a fixed conical surface. The screw is thereby almost instantaneously arrested. In lowering at low speeds the spring is sufficiently stiff to maintain the circular mass out of contact with the friction surface in all positions of the rack.

**PROPOSED CLASS IN PLUMBING AT ARBOATH.**—Under the auspices of the National Registration of Plumbers' District Council, a meeting was held on the 17th inst. in the High School, Arbroath, for the purpose of considering the formation of a class under the programme of the City and Guilds of London Institute. Provost Keith presided, and introduced Mr. A. L. Peacock, teacher of plumbing in the Technical Institute, Dundee, who gave his introductory lecture on "Lead: its various properties, methods of preparation, qualities, sizes, weights, applications, and behaviour when exposed to action of gases," instancing the galvanic action set up by lead in proximity to zinc immersed in water, and concluding by referring to the importance of a knowledge of electricity to plumbers, both as a branch of business and as enabling them to avoid mistakes in their more ordinary work.

**ARCHAEOLOGICAL DISCOVERY IN NORTH WALES.**—An interesting archaeological discovery has just been reported from the Vale of Llangollen, where the Rev. Trevor Owen, Vicar of Trevor, is conducting a series of excavations at Valle Crucis Abbey. Whilst excavating along the north of the ruin, Mr. Owen discovered the tombstone of a Knight-Templar, bearing a clear impression of the knight's sword sculptured at the base, beneath which were a few decayed bones. In completing the excavations along the west front of the abbey, the base of a spiral staircase was also discovered. Seven pieces of molten lead and iron and charred wood and stone have been discovered, clearly demonstrating that the original abbey was destroyed by fire, and it is now believed that the monastery was suppressed, during reconstruction, by Henry VIII.

**LEIGHAM COURT ESTATE.**—We advertised last week to a scheme of the Artisans', Labourers', and General Dwellings Company for building over the Leigham Court Estate. That property was sold in July, at auction, for 90,000L. Having a frontage of 825 ft. along the eastern side of the main road from Brixton, it lies between the Streatham Hill and Tulse Hill railway-stations. The house, in the Classic style, and standing in a finely-timbered park, was for some years occupied by the late Mr. J. Tredwell, railway contractor. His widow preserved here a pick and a shovel which her husband had himself used when a navvy, during the first stage of his career. To enable them to begin operations speedily, the directors ask for a present subscription by the proprietors and their nominees of 100,000L in ordinary and preference 10L shares, and for a like subscription a few months hence. The neighbouring house (built in 1829, and since enlarged) and grounds having been vacated by the St. Ann's Asylum, was purchased rather more than two years ago by the St. Pancras Board of Guardians. The new sanitary and other alterations were carried out by Mr. H. H. Bridgman, architect.

**THE CARPENTERS' COMPANY.**—The annual dinner given by this Company to their friends and others interested in technical education took place on the 21st inst. in the hall of the Company, London-Wal. Professor Banister Fletcher occupied the chair. Mr. A. Preston proposed "The Examiners and the Teachers of Technical Instruction." At their schools, he said, at Stratford, wood-carving was carried on with as great success as in Belgium. Sir J. Coode, President of the Society of Civil Engineers, and Mr. T. F. Rider, President of the Builders' Institute, responded, and eulogised the work done by the Company in furthering technical education. The Rev. J. R. Diggle, in responding for "The London School Board," said they had great difficulties to overcome when they first began to teach lads the use of tools; but he was glad to acknowledge the help received from the Carpenters' Company and other Companies.



## CONTRACTS AND PUBLIC APPOINTMENTS.

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Drainage, &c.	Guildford U.S.A.	Henry Peak	Oct. 25
New Roadway, Guildford	Launceston Ward	Peak & Lunn	do.
Sewerage, Spargham	District Committee	W. R. Copland	do.
Repairs to Church, Wormalbridge, Hereford	Holmesdale F.C. Com	G. H. Gossell	do.
Water-works	Ashtedale	J. R. Wilson	do.
Coast Guard Station, Walton-on-Naze	East Ham Local Board	Official	do.
Construction of Sewers	Bengal-Nagpur Ry. Co.	Official	do.
Road Rail 1175 tons, &c.	London U.S.A.	Rodney Dixon	Oct. 29
Sewerage, Parnass, &c.	Derby U.S.A.	R. J. Harrison	do.
Fire Engine Station	Barnet Local Board	W. H. Mansbridge	Oct. 30
Gravels, Gravel, and Hogg	Manchester Guardian	Official	do.
Escape Bridges at Workhouse Infirmary	Gloucester Police Com	W. H. Mansbridge	do.
Foot-Flue Blocks	W. Smith	G. F. Lambart	Oct. 31
Hot-water Heating of Church, Cornwall	London U.S.A.	Ben. Lawrence	Nov. 1
Antion Mart, Egham, N.B.	London U.S.A.	T. de Courcy Mordaunt	Official
Two Schools and Premises, Abercrombie	London U.S.A.	Official	do.
New Cemetery, Chapel, &c.	London U.S.A.	Official	do.
Master and Road	London U.S.A.	Official	do.
Thrift and of Paving	London U.S.A.	Official	do.
Supply and Planting of Trees	London U.S.A.	Official	do.
Roadmaking, Sewers, &c.	London U.S.A.	Official	do.
Forming Roads, Draining, Levelling, &c.	London U.S.A.	Official	do.
Public House Improvements	London U.S.A.	Official	do.
Private Street Improvements	London U.S.A.	Official	do.
Alterations and New Buildings at West	London U.S.A.	Official	do.
York Paving, Kerbing, and Granite Cubes	London U.S.A.	Official	do.
Supply of Cast-iron and	London U.S.A.	Official	do.
Supplies of Broken Granite	London U.S.A.	Official	do.
Oak Park Paving	London U.S.A.	Official	do.
Paving and Works	London U.S.A.	Official	do.
Underground Conduits	London U.S.A.	Official	do.
Roadmaking and Paving Works	London U.S.A.	Official	do.
Stores and Three Houses, Egham	London U.S.A.	Official	do.

Those marked with an Asterisk (\*) are advertised in this Number. Contracts, pp. iv, and vi. Public Appointments, p. xvi.

## CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Water-works	Quarndon Local Board	G. Hodson	Nov. 1
*Pipe Sewers, &c.	Bedford Green Vestry	F. W. Harratt	do.
*Accessories to Boiler House, &c. West	London County Council	Official	Nov. 1
*Machinery and Works, Sewage Disposal	London County Council	Official	Nov. 1
Sewerage System, Brighton	Kayashan R.S.A.	Francis Fox	Nov. 1
New Wharf, Eastern Town Quay	Bournemouth Harb. Bd.	G. P. Goss	Nov. 1
Sewers and Street Improvements	Frederick Local Board	W. C. Widdowson	Nov. 1
*Erection of Houses and Alterations, Egham	The Admiralty	Official	Nov. 1
*Erection of School, Boundary Wall, &c.	Leamington Sch. Bd.	F. Foster	Nov. 1
*Machinery for Sewage Works	York Corporation	J. Mansergh	Nov. 2
*Construction of Sewers, &c.	Com. of Sewers	Official	Nov. 2
*Electric Lighting	J. J. J. J.	R. M. Champ	Nov. 2
*New Office, Leeds	Bluegarth	Alfred Widdowson, R.A.	Nov. 2
*Sewer Tubes, &c.	Manchester Corp.	Official	Nov. 2
*Sinking a Pit	Heath (Newcastle-on-Tyne) Colliery	Official	Nov. 2
*Right House, Beeston-hill, Leeds	Usher Bank, Ltd.	F. W. Rhodes	Nov. 2
*Bricks, Pipes, Girders, &c. for Drainage	Worthing (Newcastle-on-Tyne) Colliery	J. J. J. J.	Nov. 2
*Wares	Standgate Local Board	J. J. J. J.	Nov. 2
*Metallizing, Paving, &c. Widdowson	Widdowson and J. J. J. J.	Geo. B. Ford	Nov. 2

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be made.
*Clerk of the Works	Croydon Corporation	25 Guineas weekly	Oct. 2
*Clerk of Works	Bedford Local Board	Not stated	Oct. 2
*General Road Inspector	London County Council	Not stated	Nov. 1
*Chief Inspector	Tottenham Local Board	Not stated	Nov. 1
*Assistant Surveyor in Office	Kennington Vestry	Not stated	Nov. 1
*Assistant Engineer and Surveyor	Kennington Vestry	Not stated	Nov. 1

**LONDON WATER SUPPLY.**—On Tuesday last a special meeting of the Court of Common Council was held at the Guildhall to consider the report of the County Purposes Committee in relation to the water supply and the public inquiry held thereon. Prior to the discussion of the report a letter was read from the London County Council asking the court to enter into communication with the water companies to the promotion jointly of a Bill for revising the amount of charges of the water companies, and for power, if necessary, to establish an independent supply, and stating, also, that the Council were entering into negotiations with the companies to ascertain whether they were prepared to dispose of their undertakings in the event of Parliament sanctioning their acquisition by the County Council. The letter was referred to the County Purposes Committee.—Mr. Rose-Innes then moved the adoption of the report. It was not proposed to urge the establishment of a Royal Commission, he said, but to bring in a Bill for the creation of a Water Commission, who should have the control of the supply in their own hands in the interests of the public, and in the event of companies not disposing of their undertakings, to give them power to establish an alternative supply. It was not proposed to buy out the companies for 33 millions, but to give power to the Commission to settle with the companies the terms of acquisition.—Mr. Price moved an amendment that the consideration of the report should be adjourned until the Corporation and the London County Council had had a conference on the subject as proposed by the latter body.—Mr. Deputy Horn said he hoped the Court would not make the mistake it did twenty years ago, when it was disposed to take the necessary steps to buy out the water companies. It then delayed to do so, and in consequence the price would now be 15 or 20 millions dearer than then.—Mr. G. N. Johnson contended that the present sources of the water supply were showing signs of exhaustion and decay, and that they were not likely to continue to be large enough to supply the increasing requirements of the metropolis. He therefore argued that to obtain a new and independent supply would be far less costly and more satisfactory than the buying up of a failing supply.—Mr. Malins thought that the Bill should give power for obtaining an independent water supply provided that the interests of the existing companies could not be bought on equitable terms. He believed that for a third or fourth of the amount proposed to be given for the present undertakings a more abundant supply could be obtained from the Bala Lake in Wales.—After the amendment had been withdrawn, the report was unanimously adopted.

**EDINBURGH UNIVERSITY BUILDINGS.**—Notwithstanding the addition of an extensive range of new medical classes made to the Edinburgh University buildings a few years ago, the accommodation is found to be inadequate to the yearly increase in the number of students, and the class-rooms are this year already crowded to their utmost capacity. At the opening last week the attendance reached 1,120, being an increase of 159 of the number at the same time last year. There may be many more entries yet, and should this state of matters continue, it will be absolutely necessary to procure additional accommodation if the prosperity of the University is to be maintained. The building of the new college hall has been completed to the height of the main cornice. It takes the form of an amphitheatre, and will be lighted from the roof.

The walls follow the semicircular lines of the seats, and from the circumstance of there being few openings, and those of comparatively small dimensions, the effect of the elevations is very dignified. Mr. Rowland Anderson, the architect, has made provision for the introduction of sculpture by the formation of niches, which, when filled with important life to the facade. The clock-tower attached to the hall will be the highest structure in Edinburgh, and will form an effective feature in the skyline of the city, as seen from various points of view. The probable cost of the hall and tower when completed will be 80,000l. or 100,000l.

**STREET SWEEPINGS.**—According to *Indian Engineering*, the city of Bombay is experiencing difficulty in regard to the disposal of its street sweepings. The sweepings are now conveyed in carts and emptied on what are known as the Flats, but all available space at this locality, which is being gradually dotted with dwelling-houses, will be exhausted in a few years more. The Bombay Municipal authorities have under consideration a proposal to construct a steam tramway to convey the street sweepings from a spot on the Flats to the slaughter-house at Bandra for the conveyance of the daily meat supply of the city. The project, which was prepared and submitted in October last by Mr. P. H. White, Deputy Executive Engineer in charge of the Tansa Waterworks, provides for a 2 ft. 6 in. gauge steam tramway, to be laid partly in connexion with the Tansa Water Duct line. The quantity of sweepings now taken to the Flats at Tando is about 800 tons daily; the quantity estimated for in the tramway project is 1,000 tons per day. The project is a very desirable one, as it has prepared a charming sanitary ground for the future building of habitations; nor does the conveyance of meat by the same railway in the future seem quite reassuring.

**REGISTRATION OF PLUMBERS.**—A meeting has just been held in the Public Hall, Preston, under the auspices of the Local Committee for Preston and District of the National Registration of Plumbers (in connexion with the Worshipful Company of Plumbers, London). The President, in opening the meeting, said the object of registration was to enable the public to distinguish between qualified and unqualified men. The advantages of registration were that the introduction of the system would greatly tend to establish a higher order of plumbing work in general, for it would be necessary hereafter for candidates to pass an examination in the principles as well as in the practice of their trade in order to obtain registration.

## MEETINGS.

**TUESDAY, OCTOBER 23.**  
*Sanitary Institute (Lectures for Sanitary Officers).*—Mr. Charles Jones on "Scavenging, Disposal of Refuse and Sewage." 8 p.m.

**WEDNESDAY, OCTOBER 24.**  
*Institution of Mechanical Engineers.*—General Meeting, when three papers will be read. 7.30 p.m.  
*Liverpool Engineering Society.*—The President (Mr. Ferdinand Hadfield) will deliver his inaugural Address. 8 p.m.

**THURSDAY, OCTOBER 30.**  
*Institution of Mechanical Engineers.*—General Meeting (continued). 7.30 p.m.

**FRIDAY, OCTOBER 31.**  
*Architectural Association.*—Messrs. Walter Millard, A. Beresford Pitt, Needham Wilson, and Owen Fleming

on "The Present, Past, and Future of the Architectural Association." 7.30 p.m.

*Sanitary Institute (Lectures for Sanitary Officers).*—Mr. Shirley Murphy on "Infectious Diseases and Methods of Disinfection." 8 p.m.

## RECENT PATENTS:

## ABSTRACTS OF SPECIFICATIONS.

**14,018.**—RAIN-WATER PIPES. *A. P. Brown.*—This patent has for its object to secure rain-water pipes & walls of buildings by means of a hinged collar or band which, when closed, will lock the pipe in any position and when unlocked any portion of the pipe, or a new pipe, can be taken from the place—at any height—without new pipe inserted without risk of damaging the adjoining connections. The fastening or lock is made so that when it is desired to remove the pipe or to unfasten the collar the pipe is to be turned round, either to the left or right, until the projecting lug is clear of the groove; the pipe is then drawn 4 in. into the lower socket, when it can be drawn out by the collar or plate is fixed it need not be removed, which prevents the wall being damaged, and easily admits of the pipes being taken down and refixed quickly.

**14,019.**—WINDY-SASHES. *M. Rogers.*—The object of this invention is to secure the two sashes at any required height, enabling the window to be partially opened and yet secured against burglary. Upon one of the upright portions of the upper sash is fixed a continuous metal ratchet, and on the top of the lower sash and in the same vertical plane is fixed a spring bolt working into and against the ratchet. To open the knob of the spring-bolt is pulled back and turned into a side slot. The sashes can then be opened and moved either up or down. When opened to the required position the knob is raised and the spring-bolt slips forward, engaging itself to the vertical ratchet, and fastening the two sashes together.

**17,443.**—TILES. *Ed. W. Lindsay.*—The tiles which form the subject of this patent are made on the two opposite faces dovetailed grooves or recesses to receive plaster, &c. Another pair of opposite faces are notched to receive iron supports, and of the remaining opposite faces one is furnished with a recess and the other with a projection fitting the corresponding recesses and projections on the adjacent tile.

**6,904.**—GLAZING SKYLIGHTS, &c. *G. Martin.*—This invention consists mainly of a slotted sash bar, an slotted sash bar in combination with sheets of glass for roofing.

**14,146.**—DOOR BELLS. *C. F. Sanderson (U.S.A.).*—The object of this patent is to give the mechanism for operating a hammer striking on a bell by the means of simple elbow levers, and a further object is "to so connect the push-button and the lever which operates the hammer that the connection will be in alignment by the introduction of a bifurcated pitman, which permits the hammer to vibrate vertically within the space between the two arms of the said pitman."

## NEW APPLIANCES FOR REFRIGERATION.

**October 6.**—15,782, J. and W. Chivallier, Imitation Stone, Slate, Marble, &c.—15,783, D. Campbell and G. Schultz, Construction of Bridges.—15,811, H. Hardy Stays and Fasteners for Casement Windows.

**October 7.**—15,843, J. and W. Chivallier, Doors and Windows.—15,850, W. Darnett, Piping for Building Walls.—15,857, G. Redfern, Fire-grates.—15,901, J. Sears, Ventilators.

**October 8.**—15,939, E. Orford, Flush and Barrel Bolts.—15,976, G. Davis and E. Jones, Coverings for Ceilings &c.—16,085, L. Kern, Support for Builders' and Decorators' Platforms or Stagnas.—15,990, F. Tricor, Machine for Dressing Stone.

**October 9.**—16,019, F. Brooke, Water-taps.—16,053, W. McLachlan, Mould for the Production of Inlaid Design on Tiles.

**October 10.**—16,067, F. Lynde, Water-closet Traps, &c.—16,071, H. Enoch, Spreader for Water-closets, Urinals.—16,086, F. Scholer, Automatically Flushing and Disinfecting Water-closets, Drains, &c.—16,131, J. Payne, Kilm for Tiles, &c.—16,132, C. Mitchell, Capping for use as a Chimney Top Ventilating Cowl, or Exhaustor.—16,147, C. Garbath Flushing Cisterns.



E.I.T.	10	4	15	0	5	0
olia, U.S.	10	0	2	0	13	0
Canada, .....	2	10	0	2	4	5
" "	2	10	0	2	4	5
" "	8	10	0	4	15	0
Danistic, &c.	2	10	0	0	8	15
" "	2	10	0	0	8	15
Canada red	5	0	0	0	8	10
" "	2	10	0	0	8	10
" "	2	10	0	0	8	10
Danistic	5	0	0	0	7	5
Petersburg	7	0	0	10	0	0
Finland, 2nd and 1st. std. 100	7	0	0	10	0	0
" "	7	0	0	7	5	0
Peterburg, 1st yellow	7	0	0	10	14	0
" "	7	0	0	8	0	0
" "	7	0	0	10	0	0
Swedish	8	0	0	15	0	0
White Sea	8	0	0	17	0	0
Canada, Pine, 1st	13	0	0	24	0	0
" "	2	0	0	8	10	0
" "	7	0	0	10	0	0
" "	8	10	0	10	0	0
" "	8	10	0	10	0	0
" "	6	10	0	10	0	0
" "	10	0	7	10	0	0
" "	10	0	15	10	0	0
Boards, each, all kinds	4	10	0	15	10	0
Boards, each, 1 in. pre-	0	10	0	0	14	0
Boards	0	8	0	0	10	0
First	0	5	0	0	7	0
Boards, each, all kinds	0	8	0	0	7	0



**LONDON**—For rebuilding the "Portland Arms" public-house, High-street, St. John's Wood, for Messrs. Fowler & Dyson. Mr. R. A. Lewcock, architect, 88, Bishopsgate-street-within. Quantities supplied—  
 Spencer & Co. .... £5,840  
 Toms ..... 5,987  
 Voller ..... 5,998  
 Anley ..... 5,828

**LONDON**—For making-up the carriage way, &c., of Egerton-gardens, Kensington, W., for the Vestry of St. Mary Abbots, Kensington. Mr. Wm. Weaver, C.E., Surveyor, Town-hall, Kensington, W. —  
 Neave & Son ..... £277  
 J. Moore ..... 305  
 Nowell & Robson ..... 350

**MIDDLETON**—For the erection of new Board Schools and Master's house, at Middleton-in-Teesdale, for the School Board. Mr. A. Hope, architect, Middleton:—  
 Contract A.  
 Hubbard's Profit Sharing Building Co. .... £3,603 12 1  
 J. Nathan Vickers, Bishop, A. Road (accepted) ..... 2,651 0 0

**MIDDLETON**—For the drainage of Lonsdale-road, Mortlake. Mr. Henry Richards, C.E., Surveyor, Mortlake:—  
 Field ..... £286  
 Nowell & Robson ..... 331  
 E. W. Hes, Wimbledon\* ..... 230

**MURTON COLLIERY** (Durham)—For the erection of a new pit station at Murton Colliery, Durham, for the Joint Committee. Mr. Wm. Crozier, Engineer, Shire Hall, Durham:—  
 Tyne & Graham ..... £1,212 7 4  
 Wm. Grading ..... 1,157 15 5  
 J. G. Robson ..... 1,134 14 8  
 John Shepherd ..... 1,135 0 0  
 W. C. Atkinson ..... 1,083 3 3

**PLASHET** (Essex)—For erecting boundary wall and entrance gates to the Plashet Cemetery, for the Committee of the United Synagogue. Messrs. N. S. Joseph & Smith, architects, 4, Fitz-bury-square, London, E.C.:—  
 North Bros. .... £2,150  
 Fortescue ..... 1,890  
 Co-operative Builders ..... 1,727  
 G. Hosking ..... 1,727

**PONTYFRIDG**—For the erection of a new Baptist Chapel at Hatol, near Pontyfridg, for the Rev. T. Davies:—  
 Howell Powell ..... £1,412 10 0  
 W. L. G. & Davies ..... 1,396 19 9  
 (Lias Jones & Son, Porth, Rhondda Valley.  
 South Wales (accepted) ..... 1,340 0 0

**RICHMOND**—For R.L.S. and fitting-up Nos. 1, 2, 3, and 4, Richmond-terrace, Richmond, S.W., for the London and Suburban Co-operative Stores Limited. Mr. Jno. Waldman, C.E., Surveyor, 14, Basinghall-street, W.C.:—  
 Lashley & Co., Richmond (accepted) .....  
 (At schedule of prices.)

**ROTHERHAM**—For the erection of six new houses at St. Andrew's-road, Rotherham, for Mr. J. Birch:—  
 Messrs. Chadwick & Co. .... £1,300  
 W. Thornton ..... 1,220  
 E. Buhl ..... 1,190

**SELBY**—For the enlargement of the Union Workhouse, Selby, Yorkshire, for the Guardians. Mr. H. L. Tootill, 11, Westgate, Rotherham. Quantities by the architect:—  
 Messrs. Chadwick & Co., Rotherham\* ..... £6,150 0 0  
 \* Accepted.

**SHEFFIELD**—For the erection of Woodburn School, Sheffield, for the Sheffield School Board. Messrs. Whitman & Nightman, architects, York-chambers, York-street, Sheffield:—  
 G. W. & W. L. .... £12,400  
 R. Powell & Son ..... 12,000  
 Ash, Son, & Biggin ..... 11,750  
 J. Chubb, & S. B. .... 11,317  
 J. Greenwood ..... 11,470  
 G. Carr ..... 11,400

**SOUTHAMPTON**—For new public baths, Southampton, for the Corporation. Mr. W. B. O. Bennett, Borough Engineer:—  
 Contract No. 2.—Iron Roofs.  
 Goddard, Massey, & Warner ..... £1,184 0 0  
 The St. Pancras Iron Works Co. (Design A) ..... 852 0 0  
 Roman & Rogers ..... 777 0 0  
 The Ashford Railway Carriage & Iron Co. Ltd. (Design B) ..... 750 0 0  
 The Portland Portland Works Co. (Design B) ..... 612 0 0  
 W. Brettell ..... 658 0 0

**SOUTHAMPTON**—For new public baths, Southampton, for the Corporation. Mr. W. B. O. Bennett, Borough Engineer:—  
 Contract No. 3.—Buildings.  
 Quantities by Mr. H. J. Weston.  
 Dyers & Sons ..... £3,200 0 0  
 W. Franklin ..... 2,959 0 0  
 Rice & Co. .... 5,925 0 0  
 Bull, Sons, & Co. .... 5,474 0 0

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 W. Franklin ..... 2,959 0 0  
 Rice & Co. .... 5,925 0 0  
 Bull, Sons, & Co. .... 5,474 0 0

**SOUTHAMPTON**—For repairs to Hospital, West Quay, Southampton, for the Corporation. Mr. W. B. O. Bennett, Borough Engineer:—  
 Bruster & Son ..... 163 0 0  
 Baulton ..... 106 0 0

**STANLEY**—For making new cemetery, Stanley, Co. Durham. Messrs. John Smith & Sons, architects, Sholey Bridge, Co. Durham. Mr. Geo. Bell, quantity surveyor, 80, Collingwood-street, Newcastle-on-Tyne:—  
 J. T. Simpson ..... £1,670  
 Jos. Routledge ..... 1,650

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 Darden & Jackson ..... £255 10 0  
 Zach. Simpson ..... 255 10 0  
 G. J. Hillwell ..... 255 10 0

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 N. Wall & Robson ..... 500  
 N. Wall & Robson ..... 500  
 N. Wall & Robson ..... 500  
 N. Wall & Robson ..... 500

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# The Builder.

VOL. LIX. No. 7471.

SATURDAY, Nov. 1, 1896.

## ILLUSTRATIONS.

The Königstrasse, Nürnberg.—From a Drawing by Mr. A. Benesford Pitt, A.R.I.B.A.	Double-Page Ink-Photo.
Sculpture from the Soldiers' and Sailors' Monument, Cleveland, Ohio.—By Mr. L. T. Scofield, Architect and Sculptor	Double-Page Ink-Photo.
Design for a Public Library for a Country Town.—By Mr. W. Fywell	Double-Page Photo-Litho.
House at Wimbledon.—Mr. James Ransome, Architect	Single-Page Photo-Litho.
House at Sutton, Surrey.—Mr. R. A. Briggs, Architect	Single-Page Photo-Litho.

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## Architecture in Birmingham.



EXT week the National Association for the Advancement of Art is to hold in Birmingham its third annual Congress, and in the course of the proceedings a good deal will be said about architecture, wherein it consists and how the architect should be educated, or not educated but evolved, according to the various views prevalent with various speakers. It is to be hoped that the ground on which this seed is to be sown will not prove as hard and unfruitful in the future as the outer aspect of Birmingham, architecturally considered, might seem to threaten. There is no doubt that up to the present time Birmingham is one of the most architecturally depressing of all our large towns; and that if there is anything to be taught as to the true nature of architectural art from those who will speak on the subject at the Congress, such teaching could hardly be brought anywhere where it is more required. There is something about the architectural barrenness of Birmingham which seems to require some special explanation. The two or three good buildings there, one of them barely completed, are all the work of outsiders; and our own experience, which we give rather in sorrow than in anger, is that we are scarcely ever able to accept for publication in this Journal any architectural drawing sent from Birmingham. There is a peculiar and defiant absence of beauty or refinement in its local architecture which is not so conspicuously noticeable in any other English town that we can call to mind. Mere commonplace and absence of all pretence at architectural design of course is to be found in all quarters; but this is not a complaint special to Birmingham. On the contrary, there seems a great inclination there to be both ambitious in design and costly in execution, but the results are not of the right kind. People used satirically to speak of a certain type of architecture as "Manchester Gothic," but while Manchester has somewhat improved her old reputation in this respect, it is to be feared that Birmingham

ham Gothic must be placed in much the same category.

This phase of Birmingham architecture is of course of comparatively recent birth. The building which marks the architectural centre of Birmingham is Classic of the most pronounced type. It is a little more than half a century since the old and now we fear not much respected Town-hall was erected, a building the offspring of the same Classic creed which produced St. George's Hall in Liverpool. It is far inferior in size as well as in general effect to that structure, being a mere hall, whereas the Liverpool building is a hall and law-courts combined; and what is more important to notice, there is no such attempt in it at any new treatment of Greek features as there is in parts of St. George's Hall. It is frankly and purely a Classic temple with a peripteral Corinthian order, mounted upon an abnormally lofty rusticated podium. The motif of the podium was in part, no doubt, a practical one; it was intended to utilise this portion for offices, making a utilitarian story, in fact, below the state story on the upper level. The worst point about it architecturally is that there is no external suggestion of the means of access from the ground story level to that of the hall; but that was the way with the modern Classic building of the temple type. Staircases did not exist in temples, and could not therefore be recognised in modern imitations of them. A grand external flight of steps in the front would have had a fine effect, and would have added immensely to the architectural value of the building, but the practical inconvenience, in this climate, for the intended uses of the hall, would have been so great as to be prohibitive. Another defect is that the imposing effect of monumental solidity which might have been obtained by the lofty podium is seriously interfered with by the cutting of an arcade into it at the lower end of the site, with a return arch at each end, absolutely necessary of course for passage, but which takes away all the solidity of effect from this end of the building, especially when viewed from one side, where the return arch seems to weaken materially the foundation on which the superstructure stands.

With all these defects of treatment, coupled with the fact that the style imitated is peculiarly unsuited to the atmosphere of a manufacturing town, it is impossible not to feel a

certain respect for the old Classic Town-hall, more especially when comparing it with some of the structures in its vicinity. It stands well on its site; there is a breadth and repose about it which is in strong and advantageous contrast with the bustle and straining after effect which is characteristic of most of the modern Birmingham buildings. It should be noted that this, to begin with, is not the work of a Birmingham architect. There was an opportunity once for making it part of a grand architectural combination. This was at the time of the competition for the Municipal Buildings, when Mr. Lynn of Belfast sent in his splendid scheme for placing the new building on a line normal to the Town Hall, and connecting the latter with it by a bridge, so as to put the Town Hall *en suite* with the staircases of the proposed new building. The competition committee felt themselves debarred from giving the premium to a plan which contravened their instructions as to the lines of the site, but they showed their appreciation of it by purchasing from the author the right to use it, and—neglected any use of it. They thus lost for ever the opportunity of doing a great thing in Birmingham in the way of internal and external combination and climax; an arrangement which would have also given twice the architectural value and dignity and meaning to the old Town Hall. Now we have it flanked by, but entirely unconnected with, the huge mass of the Council House buildings, about as poor and commonplace a piece of Renaissance architecture (of a sort) as ever gave employment to a competition draughtsman. The general effect is flat and tame, there is not a detail in it worth looking at, and the campanile is perhaps one of the ugliest ever designed. But then it has the merit of being the work of a townsman. The façade of the older portion of the Midland Institute opposite forms an instructive contrast. This was the work of the late Mr. E. M. Barry, who did not, it must be admitted, inherit the genius of his father, but who had acquired a refinement in adopting Classic forms of architecture which at all events does not appear in the native architecture of modern Birmingham. Barry was much too fond of vases along the top of his buildings, a very commonplace detail; but the treatment of the order on the building and of the basement upon which it rests is carefully worked out; the proportions of the



whole elevation are good and harmonious; and though this kind of thing has had its day and is (like the Town Hall) unsuited to a manufacturing town in this climate, it is at any rate gratifying to see it well done in its way, and on the whole this facade may be said to be one of the best bits of architectural work in Birmingham. Its merit will be the more apparent if it be compared not only with the flabby Classic architecture of the Council House, but with the new Post-office buildings now approaching completion just below. This we presume is a piece of official architecture, and for once we may congratulate Birmingham on having set down in her streets, from a foreign source, something as coarse and commonplace in architectural design as any of her native developments. The display of vases on the balustrade of the Midland Institute buildings is a piece of elegant detail in comparison with the growths on the new Post-office buildings. Pots and tea-urns of abnormal dimensions are perched about on ledges and on cornices; the whole of it is fussy, pretentious, and totally wanting in dignity or breadth of effect. Things by no means so bad as this have been turned out from the Office of Works' mill; it is difficult to understand the production of anything so ostentatiously bad as this. Has it been the result of a kind of *spiritual* attempt to "harmonise with the environment"?

Some of the developments of Birmingham Gothic occupy the same neighbourhood of which the Town Hall forms, as we observed, the central feature. It is painful to feel that one cannot speak with much sympathy of the work of such a man as the late Mr. Chamberlain, who at heart was an artist in his wishes and intentions, an enthusiast in his work, and who certainly had a strong intention of doing something good for his own sake, and was in every way a man much and, we believe, most deservedly respected in his native town. But the Gothic addition which he made to the Midland Institute buildings is imbued with the same spirit of fussiness and coarseness of detail which seems to pervade everything produced in the town. The Lecture Hall within is even worse in this respect. It has indeed the great merit of being admirably adapted to its purpose in a practical sense, and is one of the few rooms in the country in which over a thousand people, seated on one floor, can be addressed and can hear without the least effort to the speaker. But the treatment of the room architecturally, with its brick fire-works on the wall, is almost irritating, and enough to put out of tune any one who goes there to lecture on anything connected with art. The School of Art is better, and the effort to give relief and brightness to the walls by the insertion of coloured tiles, and other devices, was thoroughly well meant, but the result is unfortunately patchy and inharmonious, though there is something of picturesque treatment in the general design.

The Mason College and the High School for Girls form two large blocks of Gothic building in such close contiguity as almost to make one group. The High School, originally built for the Birmingham Liberal Club but found too large for its purpose (rather a surprising result in a town supposed to be so radical in its politics as Birmingham), is much the best of the two externally, though both are by the same architect, and is perhaps the most favourable specimen of the class of Gothic work which obtains in Birmingham. The pretentious and what may be called jerky style of the architecture of this building, not without a certain degree of vigour, is of a type not of course confined to Birmingham; we find it in large Gothic buildings of the past twenty years in other large towns; but it has that same "note" of want of repose and refinement which is the general characteristic of the modern architecture of the town. Sir Charles Barry's "King Edward's Grammar School" in New-street is no doubt, from the point of view of the present day, very tame Gothic, and Gothic in fact was never Sir Charles Barry's strong point. But it is a useful and instructive contrast to

even the best of the modern Gothic buildings in the town, in its character of refinement and good taste; it has not that air of striving after showy effect which the visitor to Birmingham meets with on every hand among the recent buildings. Taking the average street architecture of the town as exhibited in Corporation-street, which is the costliest street in Birmingham in this respect, the impression left on the mind is quite painful, the more so from the amount of display and the show of lavish expenditure in making buildings "ornamental," which is to be seen everywhere. While there are few business streets in any provincial town more "handsome," as the common expression is, than Corporation-street, there are few, perhaps none, in our recollection, that are so destitute of real architectural beauty and interest. If we begin to consider where the fault lies, we shall probably come to the conclusion that it is in want of refinement of detail, coupled with an exuberance of ornamentation which only serves to emphasise this defect the more. We see large coarse mouldings, heavy bands stuck on everywhere round shafts and columns, florid but coarsely-designed carving got in wherever it can be got in, as if architectural beauty was to be acquired by dint of loading a building with ornamental detail without consideration of the quality of the detail itself.

Is there any reason why this kind of thing should be so peculiarly prevalent in Birmingham? The causes which influence the special character of the architecture of a modern town are always difficult to trace, but we think that the taste of Birmingham has been influenced by the fact of its being a town largely occupied in industries of a practical kind, which require a great deal of energy and ability to carry them on successfully, which bring in a great deal of wealth, but which do not in any way tend to turn the attention towards the consideration of beauty in the objects produced. The wealth is there, and the desire to make an architectural show with it, which in one sense or another always follows the accumulation of wealth; but the feeling and taste which should preside over such architectural display have been less cultivated even than usual in modern cities, because the occupations from which much of the wealth has arisen are such as tend to deaden rather than to foster the artistic sense. A strong light is thrown upon this view of the subject by the style of ornamental *bijouterie* which is characteristic of Birmingham. A few years ago there were placed in the Art Museum Galleries (we know not if they are still there) cases of specimens of recent gold work by eminent Birmingham firms, to show, amid the ancient examples, what the modern jeweller could do. The whole style of these was that of work in which the chief desire was to show the costliness of the object, the thickness and weight of the gold and value of the stones set in it, without any attempt at beauty of design beyond the most commonplace devices of star-patterns, &c.; designs with no thought and no beauty in them. The mere sight of such work, as the best produce of the town in that way, would in itself lead one to expect that architectural refinement would find no home in such a region. The spirit which puts refined and thoughtful work into jewellery is the same spirit which puts refined and thoughtful work into architectural mouldings and architectural ornament; which leads to the perception that it is not the money value of the material and labour which makes a valuable work of art, but the thought of the designer, the patient striving after the best by the worker; and that a little ornament well placed and carefully designed is of infinitely more value than a great show of coarse and carelessly-designed work, whatever cost it may represent. This is the lesson which Birmingham, with all her energy and commercial success, needs to learn, and in this respect there may we hope be some teachings during the Congress of next week which may not be without value in the end, though they may not be popular at the moment.

Among the new buildings now getting up in Birmingham is a large corner block in Corporation-street, which we fear has all the characteristics we have already alluded to in modern Birmingham architecture, and the new buildings for the Prudential Assurance Company by Mr. Waterhouse higher up in the same street. We doubt whether this will prove, when it can be seen completely, one of the most successful of its distinguished architect's numerous works, but it is at all events free from that florid character of ornamentation of which so much is to be seen around. Opposite the new Law Courts some building is going on which we understand is a waterworks establishment, of which there is now evident a small building with some half timber work in front, and the commencement of a couple of towers; what is to come of this architecturally has yet to be learned.

The new Law Courts is of course by far the most important new building in Birmingham, and is an altogether new departure in Birmingham architecture. This also, as our readers are aware, is not by a Birmingham architect, but the joint design of two London architects, Mr. Aston Webb and Mr. Ingress Bell. The building is now complete architecturally, only the interior fitting remaining to be done; but the lofty hoarding in front prevents the total effect from the street being judged of as yet. As far as one can judge from inspection of a building before the actual traffic and business in its courts and corridors has commenced, the plan seems entirely admirable for its purpose. This is not one of your "rabbit-warren" plans, but one in which the whole scheme is simple and symmetrical, and every department and corridor seems just in its right place for the purposes of the building. By placing the great hall or *salle des pas perdus* parallel with the front, the architects have been enabled to connect it in a most convenient manner with the three main corridors which run up the building, from the centre and from the two ends of the large hall. Opposite the main entrance runs the centre corridor which leads between the civil and criminal courts, and up to the semi-private corridor for the bench and the bar, which runs across the upper end of the building, and beyond which is the barristers' library. The side corridors give access to the minor courts, and rooms for various purposes in connexion with the courts. The public entrance to the galleries of the courts is entirely separate from the street, and keeps those who go merely as spectators entirely out of the way of those having business at the courts, as in the London Law Courts; but the access is more commodious and better arranged than in Street's building with its corkscrew staircase.

Detailed description of the building as completed we reserve for another occasion, our concern just now being rather with its architectural character. In this respect it is far in advance of any other recent building in Birmingham, and, as observed, constitutes almost a new departure, and gives a new architectural interest to the town. Whether the effect of the red terra-cotta is calculated entirely to convert one to the love of terra-cotta in place of stone may be a question. It is no doubt a much better material than stone for durability and retaining its appearance and effect in a smoky town, where the best stone buildings soon come to have a more or less grim aspect; but there is a smooth and almost waxy-looking texture about it which is not so effective as the texture of stone; and the material here used, though excellent of its kind and admirably worked, is to our thinking a little too deep a red for the best effect. Terra-cotta has of course the advantage over stone, besides durability in regard to atmospheric influence, that a great deal of decorative detail can be produced in it at less cost than by stone carving; but this advantage is not unaccompanied by drawbacks. The question of texture comes in again, and the ornament which would be carved if in stone, has a somewhat hard and cast-iron look in terra-



cotta. May we add also that we cannot but think the plastic character of the material has betrayed the architects into a somewhat too exuberant form of ornamentation in some places. The rounded mouldings and detached shafts of the external entrance, with the scrolls curling off the mouldings rather like wrought-iron ornament, have rather a want of repose and solidity of effect; and we regret to meet here and there with slight symptoms of what Fergusson called "the horrors of German interpenetration" of mouldings; in the heads of a good many of the corridor doors, for instance. The effect of the hall, with its heavy pitch-pine open timber roof and stained-glass windows, is indeed very rich and effective, and derives the more effect perhaps from the plain treatment of the floor (of Yorkshire stone slabs) and the simple but suitable treatment of the ground-floor doors. We could have wished that the arcades across the ends of the hall had not been of stilted arches; the evident object is to make the line of the impost coincide with the main subbase line of the hall, and thus bind the whole together; but a stilted arch is not a very satisfactory architectural form. The courts are very well treated both architecturally and practically, with some good wood and plaster work, not too ornate for the occasion; and the ceiling of the Grand Jury room is a very rich and effective piece of plaster decoration in low relief. The treatment of some of the leaded glass windows, as in the barristers' library, is exceedingly effective and well designed in a simple manner. Some of the overmantels in the principal rooms (e.g., that in the barristers' library) again suggest a note of intergradation as to terra-cotta; the ornament and small figures in some of them give a general rich effect, but totally without the sharpness of carving. For the general lining of the walls of the interior, on the other hand, nothing could be more suitable than the light-coloured terra-cotta here employed, which combines a look of warmth and comfort with monumental effect. In the interior as well as in the front we find the ornament rather too exuberant in places, and would have liked the example to be set, in Birmingham especially, of reticence in this respect. But as a whole the façade presents a piece of rich architectural picturesqueness and originality of which there is certainly no other example at present in Birmingham.

# NOTES.

**A** REMARKABLE episode in the capital and labour war occurred last week in reference to the Australian strike. A telegram from the strikers in the Antipodes, which ran thus: "Require 20,000. United Australian Unions guarantee repayment. Success assured," was read at a special meeting of the London Trades Council. It was decided that this sum should be raised. This incident is very important. It emphasises in the most vivid manner the international character which these disputes have now reached. It will also bring home very keenly to the English working man the costliness and the waste of strikes. We hope it will make him pause and consider whether the use of strikes may be carried too far. The money must come out of the pockets of the working men, and if higher wages are to be spent in taxes of this sort, is the working man much better off for the increase in his remuneration? But if it comes to a fight between money-bags, which is most likely to succeed, the capitalist or the labouring man? It is true that Mr. Tom Mann observed that "many of the unions were very rich," which is, perhaps, the cause of their aggressiveness, but rich unions merely mean that money has been collected from the working classes for the propagation of strikes. Thus it is again shown that what the working man receives with one hand in the way of increased pay from his employer he hands with the other to his union. That strikes are sometimes necessary is undeniable, but it is obvious that

when thousands of pounds are asked for, and it is boasted that the unions are "very rich," we have quite got beyond the period of legitimate strikes for reasonable wages.

**T**HE resolution of the Court of Common Council to promote a Bill next session to establish a Commission to manage the water-supply of the Metropolis, either by taking over the present water companies' undertakings or by establishing an alternative supply, is likely to have important consequences. The Corporation of London is not a Radical body, and the fact that it has, after due consideration and investigation, taken this step shows that popular opinion is ripe for an end being put to the supply of water to London by private enterprise. It is also a welcome sign of public spirit. Should the scheme be carried out, it will have an extraordinarily vivifying effect on the Corporation. It will be useless to speak of it as an effete body, it will have accomplished a great and valuable public work, which will prevent any one from saying that it is an effete and worn-out body. It remains, of course, to be seen how events turn out, but, taken up by practical men, acting on behalf of the people of London, the matter is likely to have a more successful issue than if it were taken in hand by a Government, which can take no step of the sort without laying itself open to political attacks from some quarter, and which has to be constantly on the alert not to hurt the feelings of its supporters. The sooner the Water Companies are bought out on reasonable terms, the better it will be for the people of London.

**A**N important conference was held at the Board of Trade on Tuesday between the officials of the Department and a deputation of railway managers, upon the question of rates and charges for merchandise. The object of the deputation was to convince the Department that the adoption of the schedules of maximum rates which they have recommended would involve losses of revenue as compared with the present actual charges. Summaries were handed in showing the amount of loss which would thus be sustained:—The London and North-Western being calculated at 113,600*l.*, the Midland at 117,700*l.*, Great Northern 34,489*l.* (1) and so on, the Brighton Company—who do not depend upon goods traffic for revenue,—closing the list with 4,000*l.* The companies have arrived at the conclusion that, although there is nothing to complain of in the principles which guided the Board of Trade in compiling their schedules, the schedules themselves fail to give due and fair effect to those principles. Sir Michael Hicks-Beach, in his reply, took occasion to refer to the directions to the Board of Trade which the Bill contained as originally drafted, as to the principle upon which maximum rates should be fixed, which were struck out, leaving simply the words "just and reasonable." He declined to enter into any argument, preferring to wait for the traders' answer to the statements now made. It is understood that these, together with the statistics to which we have alluded, will be made public, and they will doubtless be challenged. Of course, any inquiry into these figures would be of a public character.

**I**N regard to the question so much debated at present as to the ventilation of sewers whether by street-grids or by high ventilating shafts, the following extract from an article in the *Lancet* may be of interest to some of our readers as representing a medical opinion on the subject:—

"That the gases bred of putrefactive processes in sewers must be allowed some means of escape other than into our houses no one doubts; but while some advocate putting the vent-holes at the street level, others advise the use of ventilating chimneys which shall conduct the effluvia above the roofs of the houses. The sewer grating, be it remembered,

'Like the toad, ugly and venomous,  
Wears yet a precious jewel in his head.'

by which we mean that the stench arising from a sewer when rightly considered has its uses, for it

ought to make us instantly take measures to remove the cause of offence by flushing, disinfection, or other means. Sewage is so offensive to the eye that we have put it out of sight, and by so doing we deprive ourselves of the protection of one of our senses. If we take measures which will prevent our smelling it, we deprive ourselves of the protection of another of our senses. It must not be forgotten that by the use of high ventilating shafts we do nothing to stop the putrefactive process which is the cause of the mischief. The gases which result from putrefactive processes are not probably very dangerous to health, and those delivered at the roof level would be diluted beyond recognition before they struck the nose of a passenger in the street, although it might be otherwise with the denizens of the attics. There can be no question that offensive gas gives less annoyance to the nose when given off by a high chimney than when discharged in a confined space flanked by houses. As regards the infective microbes which, infinitely small though they be, are distinctly ponderable, it is at least conceivable that those having to fall to earth through 60 or 80 ft. would stand a better chance of being inhaled or swallowed than when delivered at the street level. On a sultry July day there comes a heavy downpour, and the torrent flowing to the sewer causes a copious escape of gas from the high ventilators. Infective microbes accompanying the gases are washed down by the rain, and in falling past the windows of five or six stories, and so to the ground, have a better chance of being inhaled than when they are hatched to earth again as soon as they emerge from the street grating. We have learnt by experience how infective particles escaping from the small-pox hospitals drift about to the neighbouring houses, and we must admit that the same kind of thing might happen in the case of infective particles given off from the high ventilating shafts."

**I**T is the fashion of politicians to regard a session as fruitful or barren according as it is prolific or barren in regard to sensational political measures. Many people regard such legislation as of less importance than mere homely Acts of Parliament. One of these passed last session is the Housing of the Working Classes Act, 1890, a measure of 103 sections, without taking into account the several schedules. It is very largely a Consolidating Act, for it repeals all the previous Artisans and Labourers' Dwellings Acts, and also the Housing of the Working Classes Act, 1885, except sections three and seven to nine. The full advantage of such a consolidation as this will be better appreciated when we point out that between 1851 and 1885 inclusive, no less than fourteen Acts of Parliament were passed dealing with working men's dwellings, most of these containing amendments of preceding statutes. In such a Consolidation Act various amendments of the existing law are necessarily to be found, but they can hardly be profitably noted in any other way than by a verbatim comparison of the last Act with those which have gone before. In regard to the part entitled "Powers of County Councils," we have already referred to the circular of the President of the Local Government Board on the subject of appeals to those bodies against the inaction of sanitary authorities. The practical value of the procedure yet remains to be seen.

**S**INCE the passing of the Railway and Canal Traffic Act the railway companies generally have been looking rather sharply after "extras"—such as warehousing and wharfage, and the charges for use of sidings. We notice that the Midland Railway Company took a case of this description into the County-court at Bedford last week, a coal dealer in a small way of business being sued for 15*l.* 11*s.*, "for rent of siding accommodation since March, 1889." The company issued a notice in February last year stating that on and from March 1 they would charge a shilling per wagon per day for siding rent upon all wagons not unloaded within four days after arrival. It was added that this step was rendered absolutely necessary by the increasing detention of wagons, which greatly impeded the working of the railway. There is no doubt that some merchants take a most unreasonable advantage in this way, and it is to be noted that the County-court Judge upheld the right of the company to make these charges, giving judgment in the case referred to for the



full amount, with costs. At most stations stacking-ground is provided, for which a rent is charged; and it is not likely that the company care to have their sidings blocked by traffic belonging to persons who do not take sufficient stacking-ground to accommodate it. In this matter, however, as in others, the weakest are the most likely to suffer. A clause in the notice provides that the company may enter into an agreement whereby a trader may be allowed to take an *average* of four days upon each wagon consigned to him during each month, the average being ascertained at the end of each month. Thus, a large merchant would be able to leave some of his trucks under load for the greater part of the month, claiming as a set-off those which are liberated on the day of arrival. The smaller merchant cannot manage these things so conveniently, and, it seems, has to pay the penalty.

SOME anxiety has been expressed as to a threatened restoration of the interesting timber church at Greensted in Essex, of which a sketch is subjoined; and a few words as to what is really the state of the church, from a special visit of inspection, may be of interest. Greensted is close to Chipping Ongar, and a path of about three quarters of a mile through the "Avenue" of Greensted Hall leads to the church. Formerly a simple wooden building, built it is supposed as a resting-place for the body of St. Edmund on its way to Bury, it is now a small church, consisting of nave, chancel, and western tower, with a projecting porch on the south side. The walls of the nave appear

of interest. We give the south-east view of the church, and the panel in the corner is a part of the monument just mentioned, the upper portion, with the shield of arms in a circular panel, having been omitted.

ONE of the most interesting features in connexion with the Art Congress at Birmingham next week will be the collection of more than 450 of David Cox's works, brought together by Mr. Whitworth Wallis, Director of the Museum and Art Gallery there. Among these, we are told, will be the signboard which Cox painted for the Royal Oak inn, Bettws-y-Coed. This painting, as some of our readers may remember, was exhibited in the then Court of Appeal, Lincoln's Inn, during the hearing, in March, 1881, of Lady Willoughby de Eresby's appeal in the matter of a liquidation petition by a Miss Thomas in the Bangor County Court. It appears that in 1847, David Cox, a frequent visitor to the inn, was asked to repaint its sign, fixed with holdfasts, outside, over the door. In 1851 he retouched his work. In 1866 the signboard was removed and hung up indoors. By an assignment of the lease and business (1876) to Miss Thomas, the picture was expressly excepted; Lady Willoughby de Eresby, who died November 13, 1888, being owner of the freehold. Lords Justices James, Cotton, and Lush, were unanimously of opinion that the signboard belonged to the freeholder as part and parcel of the house, having ceased to be—if, indeed, it had ever been—a tenant's fixture on the granting of the second lease, in 1871, to David Richards, whose widow sold her term

hence. The ground lies next to the Église de Notre Dame de France, where the Barkers' and the Burfords' Panoramas were formerly exhibited, and where the late G. C. Selous was employed as a scenic painter for more than thirty years.\* The opening of a thoroughfare into the square from Coventry-street, with the making of Lisle-street and of Cranbourne-street as a widening of Cranbourne-alley, were included amongst Metropolitan improvements proposed in 1760. Fifty years ago, Cranbourne-street was widened along its southern side and extended into St. Martin's-lane and Long-acre. But the alley had existed as a foot thoroughfare from 1679. It seems to have formed a favourite quarter for silversmiths—amongst them being Hamlet, and, at the sign of the Golden Angel, Ellis Gamble, to whom Hogarth served his apprenticeship. Gamble's shop-bill, engraved by Hogarth, bears the address, "Cranbourne-street." Having fulfilled his time there, Hogarth, *teste* Walpole, entered into the academy (Sir James Thornhill's) in St. Martin's-lane, to study drawing from the life. In 1720, he had set up as an engraver on his own account. "Engraving on copper," he afterwards said, "was, at twenty years of age, my utmost ambition."

IN the St. Anne, Soho, rate-books for the year 1740 we have found the entry of a rate of 4s. made upon "Mrs. Hogarth." Hogarth's sister Anne was then alive; his mother died in 1735. She died on June 11, through fright at a fire, which broke out two days before in Cecil-court, St. Martin's-lane, and burnt thirteen houses, amongst them that of John Huggins, late warden of the Fleet. Huggins bought that office of Lord Clarendon for 5,000*l.*, for himself and his son, the translator of Dante and Ariosto's "Orlando Furioso," and sold it to the infamous Thomas Bambridge and Dougal Cuthbert. Cecil-court and Cranbourne-street were so named as being built over the property of the Cecils, Earls of Salisbury, and Viscount Cranbourne. The court lying next, south of St. Martin's-court, has been gradually pulled down within the last two or three years. Its site will be occupied by some new premises for the Camera Club facing Charing-cross-road (*olim* Castle-street in this part), and blocks of shops, residential chambers, &c., to face St. Martin's-lane, and forming the southern side of St. Martin's-court. When Leopold Mozart brought the little Wolfgang and his sister "Nannerl" to London they first lodged, April 10, 1764, in Cecil-court, removing thence to Williamson's, in Thrift-nov Frith-street, Soho. Abraham Raimbach, the engraver, was born, 1776, in Cecil-court.

THE Grosvenor Gallery is dead, and the New Gallery reigns in its stead. Such, we take it, is the practical result of Sir Coutts Lindsay's recent letter to the press which forms the funeral éloge of the deceased gallery. It is a comic triumph for Philistinism, for in place of the late art gallery we now have a social club. If there is one thing in the world more full of commonplace and more antagonistic to art it is the modern social or political club of the Metropolis. Sir Coutts Lindsay tells us that art is still to be cultivated, for a certain number of pictures are to be hung on the walls which will be for sale. But we can scarcely imagine a more hopeless mart than such a place, where neither rich amateurs nor active dealers are likely to congregate. We can, indeed, only regard this portion of Sir Coutts Lindsay's letter as part of a decent ceremonial over the interment of the deceased gallery. Indeed, we can scarcely bring our imagination to contemplate the spectacle of a true Grosvenor Gallery picture criticised by a party of City gentlemen on their way to the smoking-room, after an ample banquet in the dining-room. But the Grosvenor Gallery, in spite of

\* Robert Barker removed hither in 1794 from Castle-street, Leicester-square. To him succeeded his son, Henry Aston Barker, whose pupil, John Burford, was in turn succeeded by his son Robert Burford in 1823.



Greensted Church, Essex.

to be the original fabric, and are of wood logs about 4 ft. 4 in. in length, and varying between 2 ft. and 3 ft. in width. They rest on a plinth of brick, and above them is the plate which carries the roof. There being no windows in the walls, this part of the church is lighted by six dormers, three on either side. The tower is of wood, with a shingle broach spire. The chancel is of brick, including the jambs of the windows and priest's door. The east window is of stone, and likewise the inner order of a modern window on the south side eastwards of the priest's door. During 1848-9 the church was extensively restored, and the roof of the nave with its dormers, and the south porch, are practically new. Unfortunately proper care was not taken to ventilate this roof under the boarding, and dry-rot has attacked it, rendering the renewal of the roof again necessary. There is one fragment of old glass—a head, appearing to be that of Henry VII., and probably coeval with the building of the chancel. On the north wall, inside the chancel, is a good mural monument to "Ione, sister of Sir Thos. Smith, of Mont, and second wife of Alane Wood, of Snodland, Kent," 1585; but this is the only object

to Miss Thomas. David Cox, who was the son of a whitesmith, was born at Birmingham in 1783. Originally destined to follow his father's trade; but temporarily disabled by an accident, he was ultimately sent to Joseph Barber's night school there. For a while he found employment as assistant to De Maria, the scene painter to the theatre, under the elder Macready's management. On first coming to London (1804) he sold for two guineas a dozen sepia and Indian ink drawings "which were disposed of by the dealers to country drawing masters chiefly, who visited London twice a year to purchase 'copies' for the use of their pupils." The "Lancaster Castle" which Cox sold for 20*l.*, was purchased at the Giltott sale for more than 150 times that sum.

THE site that has been cleared on the northern side of Cranbourne-street, Leicester-square, will be occupied by the theatre which Mr. George Edwardes is about to build, after the designs of Messrs. Phipps and Spencer Chadwick, architects, and which will, probably, be ready in twelve months

\* William Hall's "Biography of David Cox," edited, with additions, by J. T. Bunce, 1881.



an inglorious end, has done some service to art. It has inaugurated small and comfortable galleries; it has protested, not unsuccessfully, against crush and commonplace at the exhibitions. There is a career open to a legitimate successor—the New Gallery, if the latter will avoid cliques and favoritism, and endeavour to collect annually a choice and representative exhibition, in a small space, of the best works by contemporary artists, without regard to name or popular fame.

#### LETTER FROM PARIS.

The promised road from the Avenue Suffren to the Avenue Bourdonnais, across the Champs Elysées, has now been made, and there is talk of another carriage road to be commenced from the Pont d'Iéna round the Eiffel Tower to the central dome, winding round by the Palais des Arts Libéraux on the right. There is an idea of making this a kind of "allée" to the Champs Elysées and the Bois de Boulogne as a promenade, though it may be doubted whether this will be accomplished, and it is evident also that, now that the conservation of the principal Exhibition buildings has been terminated upon, there is some difficulty as to what to do with them. M. Alphand has a number of projects which are to turn them to account. The Galerie des Machines is talked of as a winter place for grand displays of sculpture, a kind of hippodrome; but it is doubtful whether this would be a success, at all events it is not likely to draw the fashionable world of Paris.

The Metropolitan Railway scheme is more talked of than ever, but without apparently making any nearer to realisation. It is the subject of numberless public meetings and of a great deal of press warfare. The supporters of the Haaga's viaduct scheme criticise warmly the subterranean scheme of M. Eiffel. This latter scheme was not really anything more than a circle railway for the centre of Paris; a circle running from the Madeleine, underground, passing by Rue Taibout, the Faubourg Montmartre and Poissonnière, the Boulevard de Strasbourg, the Place de la République, the Rue Oberkampf and Rue du Chemin Vert, the railway stations of Vincennes, St. Maurice and Orléans, the Pont Sully, the Pont Louis Philippe, the Boulevard Sébastopol, the Pont Neuf, the Rue du Louvre, the Palais Royal, the Rue des Pyramides, the Rue Castiglione, and the Place de la Concorde. The plan is a very defective one, and it is objected with reason that it would not be worth while to dig a row and tunnel for years in the middle of Paris to get a subterranean line which would be out of connexion the Gare St. Lazare and the Gare du Nord. Now, the number of passengers passing through Gare St. Lazare in the last year has been 30,280,000, a total not to be despised. It is objected also that M. Eiffel has not taken into consideration the difficulty of the subsoil lake which caused Géricault such trouble in forming the foundations of the Opera House. It will need gigantic engineering operations to render this portion of ground fit for a railway. The great system of sewers laid out under Belgrand will also be interfered with, at more than one point, by the new line. To get over this obstacle would require another complete pulling up of streets which have already for the last six months been devastated by the operations of the electric light companies.

Nevertheless the idea of a Metropolitan Railway has taken such hold on the public mind of Paris that many people are disposed to accept the scheme, the best they can obtain if not the ideal in itself, which would contribute something to the facility of locomotion in Paris. The Committee dealing with the subject has also required important modifications in the scheme, among which is that of a branch line from the Gare St. Lazare to the Madeleine, another from the Gare d'Orléans to the Gare du Nord, and a connexion with the line which the Compagnie du Nord intend to push forward to the Halles Centrales. These important modifications or rather additions have been accepted by the Eiffel Company, and a few days the Municipal Council will discuss the whole project in this form.

The art exhibitions recommence with the annual Salon of the "Blanc et Noir" which has opened the series in the Pavillon de la Paix de Paris, on the Champs Elysées. This exhibition, the fourth of its class, includes no

less than 1,500 drawings, pastels, engravings, etchings, &c. There are some very remarkable works there, among the foremost of which must be mentioned the remarkable cartoons, "Ludus pro patria" and "Légende de St. Genesive," exhibited by M. Pavis de Chavannes; the drawings of M. Charles Jacques; the sketches of MM. Forain, Pille, Renouard, and Régamy, and the last drawings made by M. John Lewis Brown, whom a lingering but hopeless illness has unhappily debarred from any more exercise of his art.

The Service des Beaux-Arts has opened at the Hôtel de Ville an interesting exhibition of the works which were sent in competition for the decoration of the Galerie Lobau in the Hôtel de Ville. This gallery, which runs parallel with the Salle des Fêtes for its whole length, includes nineteen cupolas and two half cupolas. It has been already the object of one competition which came to nothing. We now find forty-six competitors, among whom are many names well known to the public. M. Charles Tsché, the author of the decorations of Chénoucaux, has sent a series of watercolours, very spirited works, symbolising the leading corporations of Paris. M. Chabas, who has already obtained in competition the decoration of the Mairie of the fourteenth arrondissement, has associated himself with a talented young architect, M. Maubert, in a series of designs personifying the ancient and modern fêtes of Paris. M. Guillaume Dubufe has designed a green and gold scheme of decoration, with allegorical figures. M. Lucas sends a well-composed and interesting design. Many architects have entered into the competition independent of any aid from painters. Among these are M. Honnier, whose design for "Les Mois" are very pleasing, and M. Despony (Prix de Rome, 1884), whose ingenious designs are shown in black on a sky-blue ground, with very unfortunate effect. Of the political allegories (always too numerous on these occasions), the historical Republican scenes, and the apotheoses of revolutionary heroes, it is hardly necessary to speak, except to observe that they are entirely out of place in a decorative scheme of this nature. There are no doubt some very good designs, but no one of them seems to us to have realised what is required for a gallery in such a position, partially connected with a grand hall, and of which the decoration ought to form a portion of the scheme for the hall itself. Is it to be recognised that, at the close of the nineteenth century, the decorative art of France is in its decadence?

The centenary of the foundation of the Louvre Museum falls next year on the 26th of May. Many Parisian journals are proposing that this should be made the occasion of a public fête. Without going so far as that, we quite agree that the occasion may well be commemorated in some manner, either by the erection of a monumental group in marble or bronze, or by the issue of a medal; both which proposals have been made. In the meantime it is much to be regretted that the Louvre has not space at present for all the treasures which it possesses, and much to be wished that the Pavillon de Flore, no longer occupied by the Préfecture of the Seine, should be made use of to exhibit works which are now hidden away in attics. Regnaud's celebrated picture of "Maréchal Prim" was thus hidden away, and when the public demanded its production, it was necessary to remove Géricault's "Cuirassier"; and the same thing has happened in other cases, and the utilisation of the Pavillon de Flore for the purposes of the Museum entirely is the only way out of the difficulty.

In the matter of new buildings Paris has now possessed, for some days, the "Casino de Paris." This large block, between Rue Blanche and Rue de Clichy (on which latter is the principal façade), includes a hall of 2,000 square metres of area, and 18 metres high, the roof carried by a double row of light columns with caryatides at the top. This concert-room or ball-room, whichever it is to be, surrounded by a loggia, forms the vestibule to a "salle de spectacle" which will seat 1,600 persons. The whole is blazing with gilding, and is lighted by 2,000 electric lights; it is effective enough, but in a heavy and tasteless manner. The façade is hardly worth mention, except that the centre portion is occupied by an immense window which is filled with stained glass by Champigneulle, with a design signifying music, dancing, &c., according to the usual tendency of the decorations in places of public amusement of this kind.

The works at the Galliera Museum are advancing by slow degrees. The architect (M. Ginain) intends to construct in front of the principal façade a staircase which will be reached across a floor or court paved with mosaics. On the other side, the sculpture of the gable surrounding the pavilion which faces the Rue Pierre Charron has just been completed. The gable itself is decorated with the letters G. B. interlaced (Galliera-Brignolles).

The Minister of Public Works has given the order to proceed with the reinstating of the cornices, balconies, and colonnettes decorating the interior façades of the Palais Royal.

A few days since the Ecole des Beaux-Arts opened the exhibition of the works executed at Rome, in 1889, at the Villa Medici. Among the architectural works M. Tournaire, a first year's pupil, exhibits four sheets of details of the Forum of Trajan and a drawing of a votive altar from the Vatican Museum. M. Chédanne, a second year's pupil, has sent in ten sheets of drawings, including a remarkably fine one of the Theatre of Marcellus; M. Defrasse (third year) sends plans, sections and details of the theatre at Epidaurus, and a drawing of the Ca d'Oro at Venice; and M. André (fourth year) has sent a restoration of the Forum and theatre at Ostia. The jury has given judgment on the architectural drawings of the first class of architectural students. Among fifty-eight designs sent in for the subject of "A Pantheon," second medals have been awarded to M. Baubain, pupil of MM. André and Laloux; to M. Vallat, pupil of MM. Donillard and Thierry; and to M. Desperthes, pupil of his father and of M. Ginain. In the sketch competition second medals have been awarded to M. Schule and M. Closson, pupils of M. Ginain.

A few days previously, the competition for the Sévres prize took place, the subject of which, as before mentioned, was a table service and dessert service. Out of eleven designs submitted, the prize was awarded to M. Fournier, and three equal prizes to MM. Bonafoux, Maldémé, and Sandoz; all four being pupils in the National manufactory at Sévres.

We regret to record the death on October 16, of the painter Auguste Toulmouche, author of many charming *genre* pictures which have been popularised by engravings and photographs. He was born at Nantes in 1829, and came at an early age to Paris to study in the atelier of Gleyre, and exhibited his first work, a portrait, at the Salon at the age of nineteen. His early works after this were historical subjects, one of which gained him a third medal in the Salon of 1852. But he soon abandoned classic painting for *genre* and scenes of modern life, for which he obtained a great reputation. Among the best known are "Le Terrasse," "Après le Dîner," "Le Premier Chagrin," "Le Lendemain du Bal," "Un Mariage de Raison," "Le Lilas Blanc," &c. He received medals also in the Salons of 1861 and 1878, and in the great Exhibition of last year. He was a man much liked among those who knew him, and not spoiled by success.

We have to mention also the death of M. Gaston Melingue, former pupil of Léon Cogniet, who exhibited many times at the Salon; his last year's picture being "La Cigale et la Fourmi." He was a son of the eminent actor Melingue who created the part of Benvenuto Cellini at the Porte St. Martin Theatre, and who was also a sculptor of great ability.

THE ENGLISH IRON TRADE.—There is scarcely any change in the English iron market. Business is quiet, but a steady tone continues to prevail. In pig-iron trade is still restricted, and the greater part of such iron as is required for immediate wants is either supplied by second-hand holders or drawn from stocks, makers declining to sell except at their own prices. There has not been much fluctuation in Scotch warrants, but the tendency has been upwards. Middleborough pig is practically unchanged. Bessemer iron in the North-west is quiet, but steady, and the consumption is larger than the output. A moderate business is doing in finished iron, rates being tolerably steady. In steel a fairly active demand prevails, with prices firm. Shipbuilders and engineers continue busy.—*Iron.*

FRENCH GALLERY, PALL-MALL.—The private view at the French Gallery, 120, Pall-Mall, has been postponed from October 25 to November 15, in consequence of the death of Mr. Henry Wallis, the well-known owner of the Gallery, under whose management so many interesting exhibitions have been held there. The exhibition to be opened on the 15th will consist of a collection of the works of Mr. B. W. Leader, A.R.A.



## A NEW BOILER-TUBE.

DURING last week some boiler trials were made at the works of the great Sheffield steel-makers, Messrs. John Brown & Co., Limited. As these trials are likely, so far as can be judged, to have a considerable influence on the engineering practice of the future we will give a few details of them, and also of the invention which they were intended to test.

This invention is of French origin and is of the simplest description. In place of the ordinary plain cylindrical boiler-tube, M. Serve, the inventor of this new tube, places on the inside eight continuous longitudinal ribs which project radially into the interior of the tube. These ribs are in depth (or height) about one quarter of the inside diameter of the tube. The object, of course, is to give additional surface for the absorption of heat from the gases and products of combustion passing through the tubes from the furnace, or combustion-chamber, to the smoke-box. It is a well-known fact that the stream of gases passing through a tube is generally hotter in the centre, or core; the parts which have been cooled by contact with the metal of the tube remaining on the outside of the column as it passes; or, in other words, the gases travel in straight lines parallel to the axis of the tube. This being the case, it will be at once seen how effective in tapping the flow of heat these projecting ribs are likely to be. It may be objected that although there is more surface for the collection of heat from the gases, there is not any additional surface for the transmission of heat to the water of the boiler, as the outside of the Serve tube is the same as that of an ordinary tube, in fact, that there would be a throttling of the flow of heat at the base of the ribs. The answer to this objection is that the chief resistance to the flow of heat through metal is experienced at the surfaces, and that once the heat is absorbed by the metal it can travel through the interior with great facility. This fact, the knowledge of which was first deduced from theoretical reasoning, has been amply proved by practical experiment; and it is well known to engineers that two boiler-plates of, say,  $\frac{1}{2}$  in. placed together, will not transmit heat so readily as one of 1 in., because of the increased surface resistance. Having said so much of the theory of the Serve tube, we will give a few practical details.

Some time ago the French Admiralty made a very exhaustive trial of the Serve system at the Dockyard at Brest. A boiler of ordinary construction was set apart for the purpose. It was first fitted with ordinary brass tubes, and tested under certain conditions. These tubes were then taken out, and Serve tubes of brass were fitted. We have before us a copy of the official report, but, without wearying our readers with the elaborate and complete details which are characteristic of French reports, we may give the chief results obtained in brief.

The heating-surface of the boiler was 375 square feet, and the grate surface  $14\frac{1}{2}$  square feet. There were sixty-four tubes, 6 ft.  $7\frac{1}{2}$  in. in length, and 3 in. outside diameter. The height of chimney was 40 ft. 8 in., the diameter being 18 in. The trials lasted over several days, and resulted in the following percentages of gain due to the Serve tubes:—

First day with natural draught	13.9 per cent.
Second ditto	15.6 "
First day with forced draught	
at $1\frac{1}{2}$ inches	17.2 "
Second day, ditto, at $1\frac{1}{2}$ inches	20.4 "
Third day, ditto, at $1\frac{1}{2}$ inches	22.2 "
Fourth day, ditto, at $1\frac{1}{2}$ inch	19.8 "

We will not pause to comment on these remarkable figures, the importance of which is apparent on their face. The only thing against them, at the time they were made known in England, was that they were considered too good to be true.

Last week we had, however, the trials at Sheffield, to which allusion has already been made. The high standing of the firm making the experiments, and the fact that they were carried out under the inspection of several well-known engineers, including Mr. Ellis, of the Admiralty, and Mr. Milton, the Chief Engineer of Lloyds, was guarantee that everything would be done to ensure a fair trial. We may also be permitted to add our testimony to the willingness shown to allow the results to be verified in every way possible.

For the purposes of trial two ordinary return tube boilers had been constructed, each 10 ft. 6 in. long, and 10 ft. 6 in. in diameter, and exactly alike in all respects excepting that one had plain ordinary tubes, and the other Serve tubes. In each there were 126 tubes of  $3\frac{1}{2}$  in. outside diameter. In each boiler the area of grate surface was 31 square feet. The total area of heating surface in the Serve tubed (No. 1) boiler was 1,536 square feet, and of the boiler with ordinary tubes (No. 2) 956 square feet; the difference being entirely due to the ribs on the tubes being calculated as effective heating-surface. The total area for passage of gases through tubes was 802.36 square inches in No. 1 boiler, and 852.18 square inches in No. 2 boiler. This difference again was due to the ribs in the tubes only. The boilers were fitted with fans in the chimneys, so as to give an accelerated draught on the Martin principle. The coal used was of the very best quality, being Nixon's Navigation.

The trials commenced on Tuesday of last week, the 21st inst., there being a three hours' run with each boiler in the morning with  $\frac{1}{2}$  in. induced draught, as shown by the water-gauge. The result was briefly as follows:—

## No. 1 Boiler (Serve Tubes).

Evaporation of water	32,500 lbs.
Coal burnt	34 cwt.

## No. 2 Boiler (Plain Tubes).

Evaporation of water	31,000 lb.
Coal burnt	37 cwt.

This would be equal to 4.8 per cent. greater evaporation, and 14.1 per cent. more economy in fuel for No. 1 boiler.

In the afternoon a three hours' run was made with natural draught, the results being as follows:—

## No. 1 Boiler.

Evaporation of water	18,200 lbs.
Coal burnt	16 cwt., 0 qr., 18 "

## No. 2 Boiler.

Evaporation of water	20,100 "
Coal burnt	20 cwt.

This would equal 9.4 per cent. less water evaporated and  $12\frac{1}{2}$  per cent. economy of fuel for boiler No. 1.

These trials may be taken as simply preliminary. In fact, they were of too short duration to afford any very conclusive test.

On the following day a twelve hours' trial was made, the coal consumption in both boilers being equal, this result being obtained by regulating the draught. The following results were obtained:—

## No. 1 Boiler.

Water evaporated in 12 hrs.	114,600 lbs.
Coal burnt	11,872 "

## No. 2 Boiler.

Water evaporated in 12 hrs.	103,000 lbs.
Coal burnt	11,872 "

These results show a superiority for the Serve tube of 11.28 per cent. in evaporation on the given quantity of coal.

On October 23 a seven hours' trial was made, the draught being  $\frac{1}{2}$  in. in both cases. The results were as follows:—

## No. 1 Boiler.

Water evaporated	61,500 lbs.
Coal burnt	6,496 "

## No. 2 Boiler.

Water evaporated	53,200 lbs.
Coal burnt	6,496 "

In this case, the Serve tube boiler showed an additional efficiency of 15.6 per cent.

On the last day of the trials, a  $7\frac{1}{2}$  hours' run was made, under somewhat similar conditions to the last, when a superior efficiency of 15.86 per cent. was shown for the boiler with Serve tubes.

It will be seen by the above that a very remarkable advance has been made in the generation of steam,—the more remarkable, because so small a price has to be paid for the advantages derived. No doubt, the Serve tubes will be somewhat dearer than those of the ordinary kind, but we should imagine the extra cost would be but trifling compared to the advantages gained.

It should be stated that the French experiments were with brass tubes, whilst the tubes in the Sheffield boilers were of steel.

## THE ARCHITECTURAL ASSOCIATION.\*

IN May, 1887, a general conference of architects was held, and a day devoted to the question of architectural education. It is interesting to note the views of the various speakers, and I think that I cannot do better than give you a few extracts from the papers that were read on the subject on that occasion. These papers, as you are aware, were published by Mr. Cates in the form of a small book, and a very useful and interesting book it is, too, as recording the views of those best able to speak on the subject. The book also contains an introductory note by Mr. Cates, in which he says, speaking of the course of instruction adopted in three institutions in America: "These systematic courses, which have counterparts in Germany and Austria, contrast forcibly with the custom of pupillage adopted in England, which ensures only some three years of office training, such as it is, and leaves the student to acquire in a haphazard manner without due guidance or encouragement, or neglect altogether, knowledge which is indispensable; he thus too often becomes only a sketcher or draughtsman, or a mere practical man without sound scientific knowledge;" and further on: "A thorough and systematic scientific, practical, and artistic training, based on a sound general education, will ensure that the title of architect shall imply that its possessor may reasonably be expected to be a reliable and trustworthy adviser on all artistic and practical details . . ."; and again he says: "The burning questions of 'Federation' and 'Registration' which were to be considered at succeeding meetings, were less important to the well-being and prosperity of the profession than this vital one of education, which must largely influence any decision upon either of the others." We thus see that in 1887 Mr. Cates thought that the systematic course adopted in America contrasted forcibly with our English custom of pupillage, that a thorough and systematic scientific, practical, and artistic training was advisable, and that the burning questions of Federation and Registration were less important than the vital one of Education. Note that the words training and education are used, and not cramming and examination. I think we may, therefore, look to Mr. Cates to help us either to persuade the Institute to start a course of instruction of its own or to help us with ours.

Professor Babcock in his paper insists upon the advantage of a thorough technical education for architects. His opening words are: "May I not assume, in the presence of the educated gentlemen whom I have the honour to address, that the question of the desirability of educating young men specially for the profession of architecture is one that needs no discussion? May I not take it for granted that technical education is necessary in order that architects may keep up with the times? They must have a knowledge of art, of science, and of certain mechanical trade work. How can that knowledge best be acquired? Will the young men get it most readily and thoroughly in an office, through the casual and hurried hints of his employer, and the directions given by the chief draughtsman, supplemented by such reading as he can find time for? Or in a proper school, under skilled teachers, whose sole business is to instruct? Professor Babcock says much more to the same effect, clearly advocating systematic training and I think we can judge for ourselves, by the work we see in the illustrated American papers, that the American architects are doing most excellent work in spite of the disadvantages of living in a new country with no old work to study from. Although Professor Babcock advocates a complete course of school training before a young man enters an office, which is not quite what we are agitating for at present, yet his concluding words are of much interest, and I give them here. "A few words in regard to the practical results of the effort which our schools are making to teach architecture. Students who graduate from the four years' course are enabled at once to get employment. Their acquirements in drawing, designing, and mathematics make them particularly useful to their employers, and they commonly get rapid promotion. Whatever can be learned in an office they are particularly well qualified to profit by. Their habits of study lead them to investigate anything that on first presentation may not be

\* President's address, continued from p. 327, ante.



clear. Their education has given them a power of absorption and assimilation by which they take in and digest knowledge from every available source. They soon learn the business methods of an office, and after two or three years of service may safely venture upon the practice of the profession." What a glorious picture for a young Englishman to contemplate, and for the English architect to sigh for! Competent assistants after four years' training, and competent architects after seven. On our side we are afraid it is more like moderately competent assistants after seven years' training, and very moderately competent architects after ten or twelve.

The next paper that was read was by Mr. Robins. It is full of interest from beginning to end, and you cannot do better than read the original for yourselves, as I can only give you a few of the more pithy remarks made by Mr. Robins. He begins: "The examination of architects has long been an established fact. Its first start was in the form of voluntary examinations. The present examination is compulsory for all who aspire to be associated with the Royal Institute of British Architects. The education of architects is by no means an established fact; it is but an inference. It is taken for granted that architects are educated on, and that the examination was all that was needed to show their title to the diploma, which it was contended was necessary to give to the public the confidence they required, and to give the architect the distinction he deserved."

"But if the examination has served any good purpose, it has certainly been the means of opening our eyes to the necessity for more education, both general and technical."

And again, "the chance knowledge picked up by a pupil in an architect's office, brought straight from an ordinary middle-class school, innocent of either art or science, with everything to learn, and nobody to teach him, is not the sort of person calculated to do honour to the Institute, though he may have just sneezed through and obtained a pass entitling him to become an Associate of the Institute."

"The standard of the Institute examination will certainly have to be raised in the near future, but it must be gradually done, and that connexion with some well-organised scheme for imparting to architects the special knowledge they are admitted to require as professional men and practising architects seeking the Institute diploma."

Further on he says: "While we are not satisfied with the old system of apprenticeship, and think it is not now sufficient for the needs of the profession, we are not now proposing to do away with apprenticeship, but, on the contrary, to render it more effective."

The last extract I will give you from Mr. Robins' paper is as follows, and shows pretty clearly what his views as to the Institute "not being a teaching body" are,—or, at any rate, were:—"As to the day courses for pupils in offices, here again the want will create its means of satisfaction. And it is not altogether visionary to suppose that the Institute itself might organise a system of teachers and lecturers for architects' pupils."

I feel sure that the above extracts show that Mr. Robins is in favour of more systematic training for architects, and that he will help us either to persuade the Institute to supply the want, or help us to do so ourselves.

Sir Philip Magnus sent a communication to the chairman of the meeting, in which he says:—"It seems to me that there are distinct advantages in our own system (over the German); but having regard to the scientific knowledge which architects now require in the construction of all buildings, our present system, I venture to think, needs to be supplemented by special instruction in a technical school."

Mr. Arthur Hill, of Cork, next read a paper of considerable interest, beginning in the following terms:—"In all professions, special training of some kind is an acknowledged necessity. The old-fashioned system of apprenticeship, whatever advantages it possessed, is now as far out of date for professions as it is for trades."

"If any one desired to make his son a doctor, would he bind him apprentice to the old family physician; to copy prescriptions; to read such medical books as might come in his way indiscriminately; and occasionally, perhaps, to have the benefit of a little carriage-exercise in his master's brougham? Would the process be likely to produce the highly-trained body of

scientific men who, as physicians and surgeons, are now to be found in every corner of the kingdom?"

Further on Mr. Hill says: "People fancy that the routine of an office and the payment of a fee will supply all the education that is needed from the time a boy leaves school until he is expected to be able to swim for himself. And even if any one thinks otherwise, where will he find the professional training he requires?" Mr. Hill later on adds: "... I believe the necessity of some system of education for architects is no longer in question; that nothing remains but to devise the way and the means. Since then (referring to a suggestion he made thirteen years before) the Royal Institute of British Architects' Examination has come into existence, and any system of education that may now be devised should be so built up that this examination may become the keystone of the whole." Mr. Hill, you observe, speaks of the Institute Examination as the keystone of a course of education, but what is a keystone without an arch? Something rather worse than a ship without a rudder. Having got our keystone first, however, let us now go to work with our arch before it is altogether too late; but let us see what more Mr. Hill has to say on the subject. Continuing from my last extract, he says: "Now, examinations conducted without a properly-connected underlying system of tuition cannot be productive of any uniformity of result; a defect fatal to any broad influence of general benefit to the profession. But with a system of collegiate training not confined to the metropolis, but scattered in many parts of the kingdom, all working in harmony, preparing candidates for this examination, a very different result would be attained; for there can be no doubt young men who had spent two or three years in some college where their time was wholly devoted to study, and not frittered away in the common-place duties of a drawing-clerk, would inevitably surpass those whose reading was of the present promiscuous type, thereby tending (1) to raise the standard of the examinations and consequently of the profession at large; (2) to impress the public with the advantage of proper preliminary training. . . . Of course, any scheme of education would be doomed to failure unless it were taken up by the profession at large with the intention of making it an ultimate success; and it is upon this particular aspect of the education question that the conference may be so influential." Mr. Hill is therefore clearly in favour of a systematic training for young architects, and he further sees the advisability of any scheme of education being backed by the whole profession. On this point I quite agree with him, and it is for this reason that I think our proper course is now to memorialise the Institute, either to start an educational course of its own, or to back and help us with ours. Mr. Hill's opinions being what they are, I think there can be little doubt but that he would help in whichever of the above courses was adopted.

Professor Aitchison followed with a paper which, though somewhat lugubrious in tone, yet advocated training of a systematic nature. He says: "It seems to me that as we cannot produce men with great intellects, and with a taste for architecture, our only plan is to look at what is wanted, and to render the acquisition of the necessary knowledge as easy as possible, and above all things, to bear in mind that, though we cannot produce a genius, we may spoil one by smothering his talent under a mass of knowledge (1). . . . We have, therefore, not only to provide the proper instruction for the one born architect, but we have to furnish the others with something that will more or less take the place of natural powers and invention." . . . "Though 'self-taught' is well taught, real systematic instruction is, in my opinion, invaluable; it not only saves time, but it is more thorough and complete; only the teaching must not be by pedants, however learned or able, but by men who know that their teaching is towards another end, and who will render it as useful as possible to that end. . . . From a lack of preliminary knowledge pupils seem to me to leave an office at the very time the knowledge they can only get there is beginning to be of use to them." Professor Aitchison would therefore help us, I have no doubt.

Professor Roger Smith in his paper advocated the formation of a studio, "where regular systematic instruction day by day, at the drawing-board chiefly, could be given, and, therefore, different from and in addition to the classes at

King's College or University College or the Architectural Association." The Professor's idea has been carried out by Messrs. Bagge and Millard with considerable advantage to those attending; and in our proposed curriculum the "studio" plays a very important part. Therefore, as far as that goes, we may count on Professor Smith's support. As his paper was almost entirely confined to the suggested studio, I will only quote one more passage from the Professor's paper. He says: "No proposal for architectural education is, in the judgment of most of us,—certainly in mine,—likely to supersede pupillage as the most valuable way of fitting a youth for the practice of architecture. But something is needed that shall supplement pupillage."

Mr. Spiers followed with a paper describing the work done in the architectural school at the Royal Academy, of which, as you know, he is master. Mr. Spiers approved of the methods there adopted, and, in the course of his remarks, said: "I feel strongly, in these days of progress in education, that it is impossible to stand still, and, although the advance in architectural design, which has taken place in England during the last fifteen years, is greater than the most sanguine of us could have hoped, that very progress should give us hope, and incite us to further endeavours in the promotion of greater development." As we propose to introduce something after the manner of the Academy architectural school into our curriculum, and as Mr. Spiers says that in these days of progress we cannot stand still, he presumably would help us to move the Institute either to help us or start a system of training of its own.

Mr. Lawrence Booth, President of the Manchester Architectural Association, said: "The Institute having obtained, under Royal sanction, enlarged powers, intended to increase its usefulness, there appears to be an implied obligation that no time should be lost in applying them to some practical purpose. . . . But if the Institute would only assume its proper position as the Alma Mater of the whole profession, receiving and distributing valuable assistance without distinction or favour, it would at once become apparent that the provinces are capable of giving as well as receiving something substantial for the general good." Again: "But, above all, there would be opened out for the Institute itself such a sphere of beneficent educational administration as would enable it to justify even its royal title; and, by exhibiting to the world a body of high-minded men unselfishly seeking to qualify those of their own 'calling' as efficient and useful members of the community, it would assuage the doubts of those who, with an instinct pronouncedly national, might otherwise suspect in an application for the power of absolute control over the entry into the practice of our profession only an attempt at a selfish monopoly, or, in other words, a mere development of trade unionism. . . . Once placed the education and training of students in the forefront, as one at least of the Institute's most important aims, recognised by it both as a privilege and as a responsibility, with equal earnestness, and there would be such an accession of numbers and strength as has not been either developed or even suspected to have an existence." Mr. Booth is clearly with us in our endeavours to get established a more systematic course of training for our students, and he evidently thinks the Institute is the body to do it.

The last paper read at the meeting was one by Mr. Gotch, whose opinions on the subject are, I think, well known in this Association. However, I will complete the series by giving you two extracts from Mr. Gotch's paper. Speaking of the system of pupillage, he says: "And when he" (the young man) "is article'd, what does his apprenticeship do for him? In nine cases out of ten it makes him at the best an architectural practitioner; but as for being an architect, with a desire to tread the higher and nobler paths of the profession, very few offices make him that,—at least, provincial offices. . . . Our supplemental charter will give us greater scope, 'and it will be one great step towards improving our system of education if we establish such a series of examinations as has been sketched. It will bring the question into focus. There will yet remain the more difficult task of providing the agency by which the instruction necessary to meet these examinations is to be obtained. As a stop-gap, the course of study to be followed at existing institutions will be of great use; but I



for one shall hardly be content till the function now fulfilled on a voluntary system by the Architectural Association has devolved upon an authority recognised by the profession, and in a manner to reach not only students living in London, but those whose lot is cast in the obscurity of the provinces." We can count upon Mr. Gotoh, therefore, to goad the Institute on either to recognise and assist us or to do the work of education itself.

After all these papers,—ten in number including the chairman's opening remarks,—each one advocating education, the meeting promptly (probably with the assistance of a little wire-pulling) passed four resolutions in favour of examination! It is hard to understand, but so it was. However, I think the time has come when we all agree that something more than examination is necessary to ensure the production of a creditable generation of architects. I hope I have not tired you with the numerous extracts from the papers read at the conference of 1887. I have embodied them in this address to show that neither I nor your Committee are by any means alone in advocating a proper course of training for architects; neither am I alone in thinking that the Institute should bestir itself to provide, in some shape or another, such a course of training. I also referred to them to show that, if we approach the Institute on the subject, we have very good authority on our side for so doing; and, therefore, I once more press my suggestion that we should go boldly to the Institute, as it is the representative body of the profession, and ask the Council to either establish some course of architectural training itself, or help us to amend and strengthen our methods so as to meet the urgent requirements of the case.

Mr. J. D. Sedding proposed a vote of thanks to the President for his address. That meeting was no ordinary meeting, but was epoch-making; nor was the address which they had listened to an ordinary address,—for it was nothing less than a rallying-cry which asked for the co-operation of all the friends of the Architectural Association to come forward and help in what the President had called the crisis of its affairs. He did not think that was the right time or place for him to make any declaration upon the leading points of the President's address, but he could promise that when the proper occasion arose he would not be backward in furthering the interests of the Association as well as he could. He was heartily in accord with the proposals which had been made by their President and the Special Committee for improving the work of the Association and for giving ampler scope and permanence to its educational agencies. He fully trusted their judgment as to the best way for increasing the efficacy of the Association as an educational body. The present position of the Architectural Association afforded a vindication of the aims of its founders. To his mind, the nineteenth century, rich as it was in architectural trophies, had no more wonderful piece of building to show than that of the Architectural Association, and let them not blink the fact that that chief and only institution for the regular training of young architects represented the voluntary work of young men; and to him that was one of the noblest and saddest facts connected with its history. It was born of the thought, and sustained by the aspirations of the younger members of the profession. While the older men of the profession were busy looking after the main body of architects throughout the country it was left to the young men to provide the means of proper systematic teaching for the rising generation of architects, and right well had they carried out their task so far. But times changed, and movements grew, and development was a law of life. They could not stand still. For his part he liked a fine ideal, but he thought they were not ambitious enough in their proposed curriculum. They were seeking to systematise the knowledge of architecture as an art and as a science, and they desired to give a thorough, and systematic, practical, scientific training to the young architect. He was heartily with them in that, but he went even farther than they did. By all means let them have all they asked for,—book learning, class knowledge, examinations, &c.,—but let him of the ancient "picking-up system" plead for something to be added to their proposed curriculum, in the way of actual craft knowledge. What he wanted to insist upon was, that in any ideal scheme for an architect's academy, a youth that

was instructed there should have ample means of educating himself in practical art. In these days something besides class-knowledge and book knowledge was required. If they were artists, the labour of learning would be a joy in itself, and attainment their highest reward. To him an architect was an artist first, and as many things besides as a scientific education could make him; but he was an artist first, and should know his craft before he practised it. A young man learnt *technique* enough to imitate well before he grasped the meaning of expression, and he could not help thinking that they began as a rule to design too early. If they could only wait, and work, and study, and store their souls and imagination, and train their hands, it would be a great boon to architecture. It was because he believed that as in Mediæval times, so now, the excellence of English architecture would be found to lie along the lines of interesting handicrafts, he hoped to see them find room for those classes of craft-instruction even in the proposed high curriculum of their ideal Architectural Association of the future.

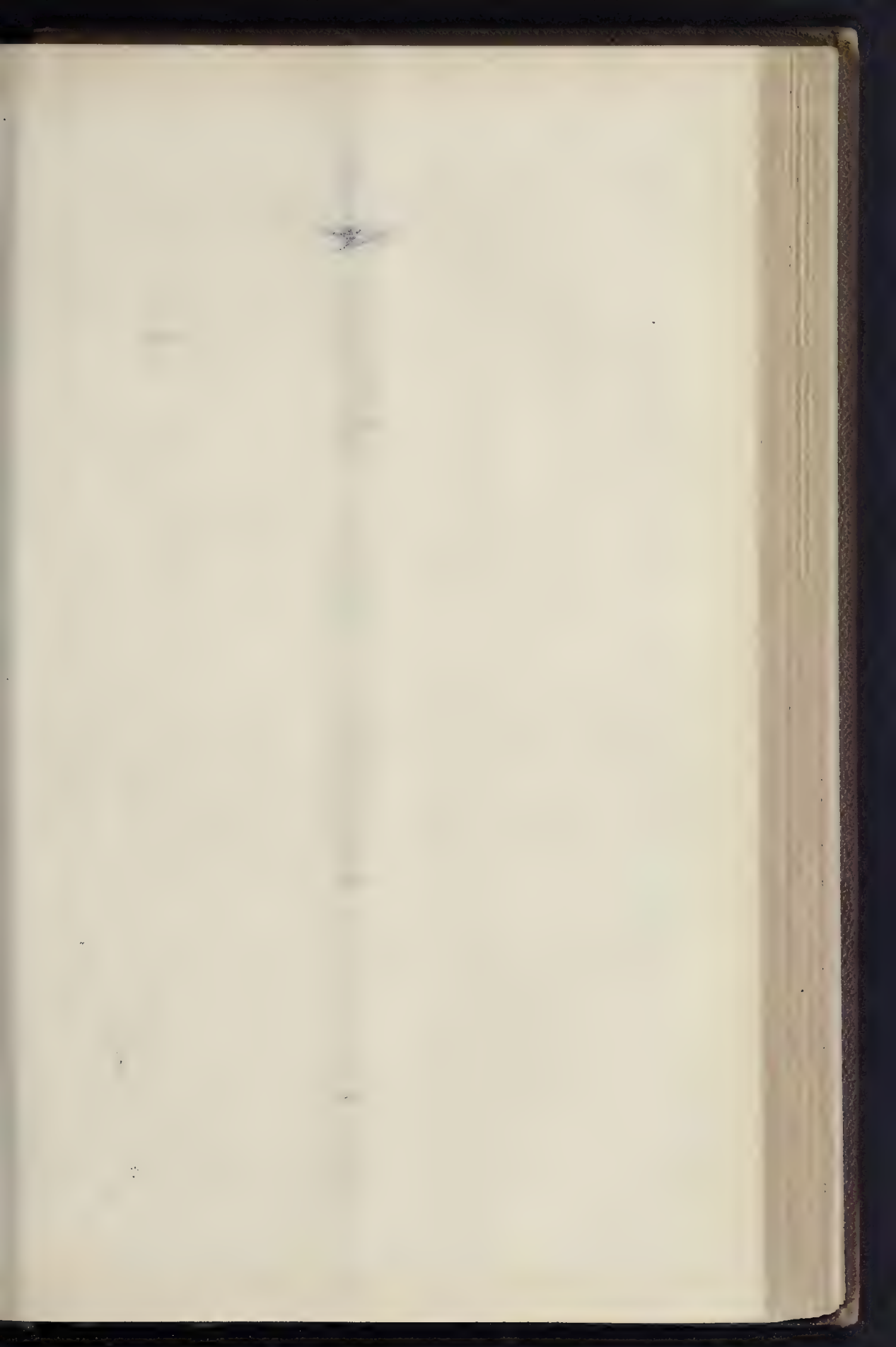
Professor Roger Smith seconded the vote of thanks to the President for his address. With regard to his (the speaker's) recent remarks on the scheme of the Architectural Association in his opening lecture at the University of London, it had been said that he seemed to be too critical. He had no wish at all to suggest that, for the scheme was not only exceedingly satisfactory, but exceedingly creditable and encouraging. But every new scheme that was designed had some provisions which did not commend themselves to people outside with the same degree of force that others did; and with regard to the general proposals, it seemed to him that they were very extensive. In the Chairman's address, an idea was expressed that it would be desirable to get some help in the matter. If there was a general feeling that any help was needed beyond the support and good-will of every member of the architectural profession, he thought it might be due to the fact that the proposal as it stood was so very large and complete, and would re-cast the whole system of the Architectural Association. He wished to make the suggestion whether it might not be practical, useful, and safe to begin with part of their proposals by thoroughly establishing some of their classes for the first year; more in the second year; and more in the third; but always keeping the whole scheme in view. By all means, if it would call forth support, let them memorialise the Institute, but do not let them wait until the Institute was able to take up the matter of architectural education. He would strongly urge them to take the matter in hand and to carry it into execution themselves. Let them get as many friends as they could to help them; but he must say that if the active power in architectural instruction existed anywhere in England, it existed in that room. He cordially wished that they might obtain assistance from the Institute, or from a conference of architects or any other body that could help, but Heaven helps those who help themselves, and the certainty of success which belonged to self-help was never more necessary than in the present case.

Mr. J. M. Brydon said that it seemed to him that they had the nucleus of a great deal in the curriculum which had been foreshadowed. There was no doubt that they had within them an amount of effort and strength which was bound in the end to succeed in which they desired. It had been said that good architecture or bad architecture was a matter of opinion. It was nothing of the kind: it was a matter of knowledge, and the more strongly it was insisted on that what was good or what was bad in architecture was a matter of knowledge, the stronger would be their position in the future as architects. The idea of the proposed curriculum seemed to be an excellent one. They must not be afraid of losing their individuality, for that would come out strong enough. We dwell too much on individuality,—at all events in England,—and lost sight of the great movements which carry on the architecture of our country. Speaking as one without responsibility, he thought the Institute ought to help them. It was all very well to say, "God helps those who help themselves," but men were born to help each other; and if a reasonable, sensible scheme was brought before the Institute, he thought it would receive the greatest consideration.

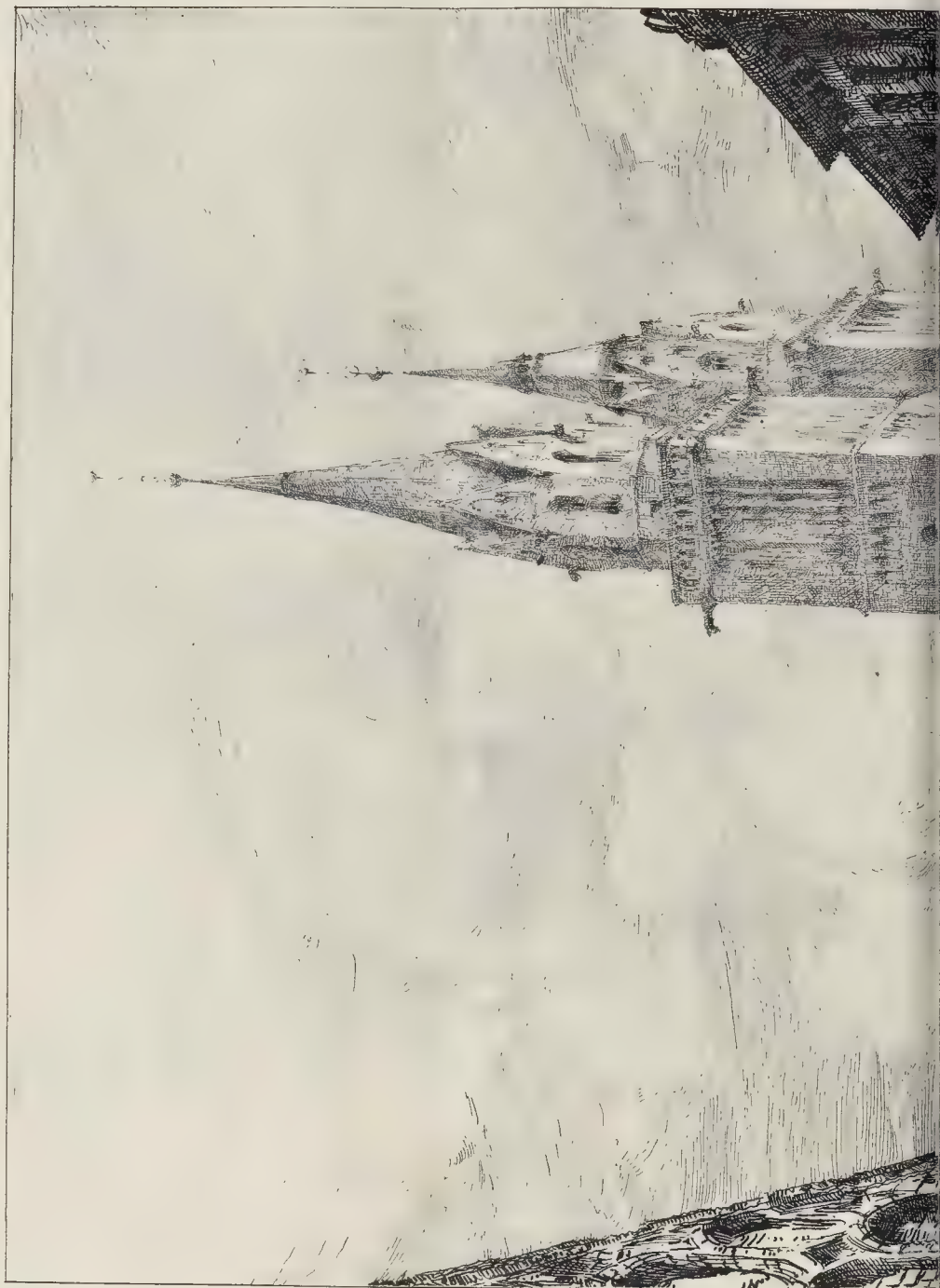
Mr. Reginald T. Blomfield said that the question of education, under certain aspects, had been

thoroughly thrashed out; but one particular corner remained untouched, and that was the education of architects as artists. A certain amount of technical knowledge,—knowledge of construction, sanitation, and practice,—was indispensable to every architect; but given that there must be added the finer feeling, the strong imagination, the executive skill of the artist pure and simple, before a man could call himself an architect. The point he would like to raise was how far, in view of the existing state of architectural education and architectural attainment, are we justified in considering ourselves artists at all? They knew Lord Grimthorpe's position, and, unfortunately, that was the position of the great majority of the British public in regard to architecture. In the case of the sculptor, in the art nearest allied to architecture, years of patient study were spent on one specific subject, the figure. The sculptor did not rest till he had mastered each subtle change of line and plane, not merely the anatomy of the muscles, but the whole relation and rhythm of the figure. He laboured with a singleness of eye and tenacity of purpose which, to an architect immersed in all sorts of studies, was amazing. Could we point to any single study which we followed out with a deliberate and sustained purpose all on a level with that of the sculptor or the painter? He was talking of the art of architecture, and did not know of any such himself. The architectural student read standard books and measured buildings, or parts of them, and made innumerable sketches; but he seldom considered draughtsmanship as much more than the acquisition of certain tricks of drawing; instead of what it is,—the basis of all art, the power of drawing rightly what the eye sees. And architecture was studied as a style not as an organic and very flexible language. If the fault of the last generation was deadly dullness, the danger to the present generation was amateurishness. An architect no less than a sculptor or a painter dealt with form and colour; and in his sculpture and colour decorations the architect was in the same field as the sculptor and the painter; and to place himself in proper touch with those men an architect ought to go through some of their training. He would suggest as a means of advancing in that direction that architects ought to pay much more attention to figure-drawing. The figure was the standard of proportion for all architecture, and we had no other rule of infallible and unalterable certainty which we could apply to the architecture of all ages and all countries. It might surely then be expected of an architect that he should have something more than an amateur's knowledge of the proportion of the figure; and the readiest means of obtaining that was by incessant study, first from the antique and then from the model. Power of drawing the figure was the final test of all draughtsmanship. No less important for an architect who reckoned himself an artist was the power of modelling. Modelling the figure was out of the question for any but the most gifted, but there were many kinds of architectural sculpture, which, in themselves, did not require any great technical skill in modelling, provided there be behind it power of design and knowledge of the effect desired, such as foliage and those subtle gradations of abstract form in which the refined designer delighted. It was most important for the architect to control the general scale and arrangement of his sculpture, for he alone knew its relation to his building as a whole, and the readiest means of doing that was to sketch out himself in the clay the main lines and balance of the piece. He hoped we had left behind us for ever the time when architecture was one art and sculpture another. Between all the arts there must be complete interdependence if ever a great national art was to arise again among us. The first step in this direction was for the architect to place himself in touch with other artists, and in sympathy with any good workman in his craft, whatever it might be. The arts wanted shaking up together; the architect should go and work under the sculptor, and perhaps the sculptor and the painter might learn something from the architect, if they would deign to consider that poor practitioner an artist at all. They had excellent opportunities for cultivating that fellow-feeling in the Academy schools. To say nothing of their own technical improvement, it was a great thing to see how their own art was regarded by others; and if they could further that fellow-





THE BUILDER, NOVEMBER 1, 1890.







THE KONIGSTRASSE, NÜRNBERG.—FROM A DRAWING BY MR. A. BERESFORD PITE, A.R.I.B.A.





between the sister arts, it would be one forward towards the reinstatement of literature in her true position as the oldest of them all.

Mr. Thomas Blashill referred to the increased practical advantages which existed at the present time as compared with his year of office as President of the Association, twenty-eight years ago. He thought the education of the architect was much too slow. Let them compare themselves with other professions. In the medical profession, for instance, a young man would spend five or six years in it, and at the end of that time he would be turned out, perhaps far from being a first-rate physician, but qualified to be entrusted with responsible work. As no architect would be called upon to undertake in the whole course of his life. He would venture to suggest to those gentlemen who had the matter in hand to get up some minimum which should turn out competent men in a few years.

Mr. A. W. Earle believed that the claims of the Association to the position of Alma Mater in educational matters was recognised by the profession generally.

The vote of thanks having been put and carried unanimously, the Chairman briefly closed, and the meeting terminated.

## LECTURES ON HOMERIC GREECE.

The subject of Mr. Leaf's second lecture on Wednesday last week was "The Comparative Prehistoric Remains and the Homeric poems," a question, he said, of great complexity, difficult to treat within the space of an hour. The lecture began with a brief review of the prehistoric remains in Greece proper; namely, it will be remembered, had been discussed in the first lecture. As regards Tiryns, a town seems to have completely sunk in importance before the "Homeric" age, at that time obviously Argos is supreme. Mr. Leaf drew special attention to the chambers in the walls at Tiryns. Similar structures have been discovered at Carthage, and this has led Dr. Dörpfeld to a hypothesis that the Tiryns fortification is of Phœnician origin. Mr. Leaf admitted the possibility, but laid great stress on the fact that local tradition had always assigned Lycian origin to the Tiryns structures.

Passing to Mycenæ, the lecturer noted that two epochs must be carefully distinguished—(1) that of the shaft-tombs; (2) that of the chive chambers. The citadel walls, following the contour of the circle which contains the shaft-tombs, must be later than those and from their excellent masonry it appears that they are roughly contemporaneous with the beehive tombs. The pottery, known as Mycænæan, has been found also in Egypt, where it can be accurately dated as of the fifteenth century, B.C. It is a marked advance on that found at Hissarlik. Beehive tombs have, it is well known, been found in many other parts of Greece,—notably Menidi, Spata, and Aphio. The art of Vaphio, as seen in the famous gold cups, is by far the most developed in this particular civilisation. Nor is this surprising, as the Achaean civilisation held its own against the incoming Dorian longer at Mycenæ than at any other stronghold. It is in the ruins of the beehive tombs that we must look, according to Mr. Leaf, for the Achæans of Homer, if anywhere. The objections urged by Mr. Leaf to this view were discussed and refuted. Passing to literary matters, which we note only so far as they are related to archaeology, Mr. Leaf stated that in the "Iliad," three stages of development could be clearly made out: (1) the original poem of the "Wrath of Achilles," mainly books 1, 11, 16, 22, and next the later additions, *i.e.* (2) songs in "praise" of the deeds of particular heroes; (3) portions composed for the sake of the poetry only. Dating these three strata with respect to the Dorian invasion,—the only possible means of dating them,—it is probable, according to the lecturer, that the first and second strata were composed before the Dorian invasion, the third after. On this point Mr. Leaf differs from Professor Jebb. The main result is that the "Iliad" is the work of many minds, whereas the "Odyssey" has a unity that shows its final form, at least, is the work of one mind; hence its greater readability.

As to the relation between the remains and the poems, a general correspondence certainly exists. In matters of detailed topography this correspondence is precise in all the portions be-

longing to the third stage of development,—*i.e.*, the part written in Ionia,—very rough in the first and second strata, where the poet was only acquainted by hearsay.

Dr. Leaf's third lecture at the Chelsea Town Hall on Wednesday last dealt with the Homeric House. The chief literary sources of our knowledge are the descriptions of the palaces of Priam and Paris in the sixth Iliad and the complete account of the Palace of Odysseus in Odyssey 17–23. In accordance with his usual method, the lecturer took these as read, and proceeded to show the plan of the Homeric House as restored by Professor Jebb and Professor Gardner. All are agreed that the three main divisions were the Aule or courtyard, the Megaron or hall, and the Thalamos, which Dr. Leaf prefers to translate as dwelling-house rather than, as it is often taken, as Gynaikonitis, or women's apartment. In certain matters of detail, however, the lecturer showed that the plan must be corrected from the remains excavated. Thus the hearth must be placed in the middle of the megaron, not at the further end. Four columns instead of eight (as on the plan) supported the roof, and colonnades in all probability surrounded at least a portion of the aule or courtyard. The idea that the thalamos was a women's apartment from which men, save the husband and son, were strictly excluded, is wholly un-Homeric, and savours of Orientalism. In the "Odyssey," Penelope, it is true, dwelt apart in the thalamos, but there is no hint of entire seclusion,—it was simply natural that she should not go down needlessly into the megaron when it was beset by the unwelcome suitors. One of the main points for which Dr. Leaf contended was that whereas in pre-Homeric palaces, like that, *e.g.*, of Tiryns, the women's apartment was remote, in the genuine Homeric house there was easy intercommunication.

Noting briefly the main points of the much-disputed topography of the "house of Odysseus," the lecturer said that he differed from Messrs. Butcher and Lang in respect to the question of the stone and wooden thresholds. In the plan as at present accepted the two are regarded as distinct, the wooden threshold is placed at the end and near the courtyard, the stone one near the thalamos. Dr. Leaf believes there were no two thresholds, the wood and the stone ones are all the same. Homer's epithets, he pointed out, are always decorative rather than descriptive. Further, if there were two thresholds, it would manifestly be improbable that the wooden one would be towards the outside, the stone one towards the thalamos.

A point of great interest is the significance of the tholos in the Homeric house. The single mention of it is in the Odyssey,—the wicked serving-maids are caught and killed between the tholos and the wall. In the prose translation of the Odyssey by Messrs. Butcher and Lang, the word is rendered "kitchen-dome." The idea of a dome is essential to a tholos; kitchen is a mere conjecture. In place of this conjecture Dr. Leaf hazarded a new and very interesting theory. Mr. Frazer, in his recent treatise on Vesta, has shown clearly that the primitive form of the house was among many people the tholos. It has already been seen that the tholos was the primitive form of a tomb, and the tomb,—the house of the dead man,—is instinctively modelled by all primitive races on the home of the living. The tholos contained the sacred fire—sacred at a time when fire was difficult to procure, and must be carefully guarded. It is remarkable that the worship of Vesta or Hestia, the primitive hearth-fire goddess, nowhere appears in Homer, and it seems possible that this cult was absorbed by the great Olympian—absorber of many a local cult, Zeus. It is noticeable that an altar of Zeus Hies-Keios—Zeus of the homestead—appears in Homer, and it is an ingenious conjecture of Dr. Leaf's that this altar may have had a circular tholos covering of some perishable material. The next lecture (Wednesday, 5th, at 5 p.m., Chelsea Town Hall) will deal with Homeric dress and armour. We propose to note, as before, such points as are novel in the treatment.

ROYAL VICTORIA HALL, WATERLOO BRIDGE-ROAD, S.E.—The following are some of the arrangements for Tuesday evening lectures at the above hall during November.—November 4, Mr. Arnold Mitchell on "Old Buildings and the Story They Tell." November 18, Mr. A. P. Laurie, "Air and Water," with experiments. The oxyhydrogen lantern will be used with these lectures.

## ELECTRIC TRAMWAYS IN AMERICA.

ONE of the features most interesting to an Englishman now revisiting the United States, after an absence of a few years, is the great advance that has been made in the system of street railways, or tramways, as they are more popularly called in England. We use the word "advance" in this connexion advisedly, for there can be no two opinions as to the great superiority to the passenger of the methods of mechanical haulage, by means of electricity or cable line, now so universal, over the old system of horse traction. A paper read by Mr. F. J. Sprague supplies us with some rather striking facts in connexion with electric traction. Six years ago, he says, there were scarcely a hundred electric motors in operation in the United States for any purpose. At the time he read his paper there were fifteen thousand in use, applied to two hundred different industries. With regard to street railways, Mr. Sprague says that the storage battery system has been quite outpaced, it being necessary to have a weight of 3,500 lbs. to propel an ordinary street car. This limits the speed and the grade of line upon which the cars can be worked. The expense, too, is about double that of the overhead conductor system, although less than that of horse traction. The conduit system, in which the electrical conductor is placed in a trough beneath the roadway, has also been tried, and found to be inferior to the overhead wire, only a very short section in Allegheny city remaining in use out of the many miles laid down in various towns of the States. It is, as has been intimated, the overhead conductor system that has made the greatest progress. There are, or, rather, were when Mr. Sprague read his paper, 130 towns or cities in the United States with one or more electric railways in operation or under contract, comprising about 1,500 miles of track. They were equipped with 1,700 motor cars, and 3,000 motors. The roads then in operation were making 100,000 miles per day, a mileage which, if arrangements then made have been duly carried out, has since been doubled. Grades of 12½ to 14 per cent. have been ascended by a motor car pulling a second car. In crowded cities the speed has increased 50 per cent., and in the suburbs twenty miles an hour are made.

Electric traction is, however, moving with such rapid strides in the United States, and, as Mr. Sprague's paper has been read some time, no doubt the figures would prove much more startling were statistics available to bring them up to date; for instance, we learn by a recent American contemporary that the Westinghouse-Pullman Company has just been formed, and will start by erecting works to the value of 500,000 dols. for the manufacture of electric street cars.

The chief objection to the overhead system is the inconvenience of having standards erected at intervals along the street to carry the wire. In a country that tolerates the elevated railroad this is but a trifle. Whether English local authorities can be educated to allow such an obstruction remains to be proved. An electro-motive force of 500 volts is used, and this, although unpleasant to the human frame, is not in itself dangerous to life; besides which the wire is placed far out of reach. Another objection is the disturbance caused to telephones through induction, but this will not apply for long if we may credit what Mr. Preece has recently said, that all telephones will soon have metallic returns; a step which we may remark in passing will render the telephone a real convenience, and not, as it was recently described, "an invention of the Evil-one, devised to propagate the use of profane language."

OVERFLOW OF WATER-TANK AT THE FOREIGN OFFICE.—On Sunday morning the overflowing of the water-tank which surmounts the tower of the building, facing St. James's Park, caused considerable commotion. Some weeks ago plumbers were engaged to repair the tank, and fixed in it some new ball floats, which, it appears, were placed so that they could not rise and fall freely. This, it seems, caused the overflow, and the water entered almost every room in the building. A messenger was despatched to the Office of Works, where a plumber is always on duty. The latter succeeded in turning off the water, when the flow soon ceased, but not until great damage had been caused to papers and furniture. The Tower Room was flooded, as was also another apartment between it and Lord Salisbury's room.



## Illustrations.

## KÖNIGSTRASSE, NÜRNBERG.

**N**OUGH Nürnberg has earned the title of the "Birmingham of Germany," its ancient walls still enclose a city almost without a rival for Mediaeval character and picturesqueness.

The electric light and steam tramways that it now enjoys, as well as the enormous railway-carriage manufacturing industry, have restrained themselves, as becomes such creatures of the nineteenth century, from altering to any serious extent the streets and buildings in which Albert Dürer and his friends lived and moved. The principal street of the St. Lawrence side of the town is represented in the sketch, and is called the Königstrasse. The proud free city of the Middle Ages must have had some other name for its high street than this in its golden days, before it was handed over to the Bavarians by Napoleon in 1806.

The Church of St. Lawrence stands at a bend of the street, with its twin "gridiron" belfry stages. Opposite its western end is the Nassauer House, on the left of the picture the fine Halle Gebäude, and on the right, in suggestive contrast, a large modern drapery establishment. The general character of the streets of Nürnberg, its wonderful dormers and quaint oriels, is well illustrated by the Königstrasse.

A. BEESFORD PITE.

## SCULPTURE, SOLDIERS' AND SAILORS' MONUMENT, CLEVELAND, OHIO.

This is a monument to soldiers and sailors of Cleveland who fell in the great American war between the North and South, now ancient history in a sense, but the memory of which still has the greatest interest for all who can appreciate the great issue of the struggle, and the amount of military genius and heroism which it called forth.

The monument was designed, and the sculpture modelled, by Mr. Levi T. Scofield, who also took an active part in the war, first as soldier and then as officer, and, in modelling the four sculpture subjects which stand on pedestals opposite the four faces of the monument, was to a great extent illustrating scenes in which he had himself taken part.

For the architectural design of the monument, of which we give a small sketch (mainly to indicate how the sculpture groups illustrated are connected with it), we fear we cannot express much admiration, and perhaps the sculpture will hardly pass the ordeal of criticism from the London or Paris studio point of view; but we think our readers will agree that there is a considerable interest in this attempt to make sculpture subservient to the representation of actual and realistic fact from the battle-field, and by an eye-witness of the scenes represented.

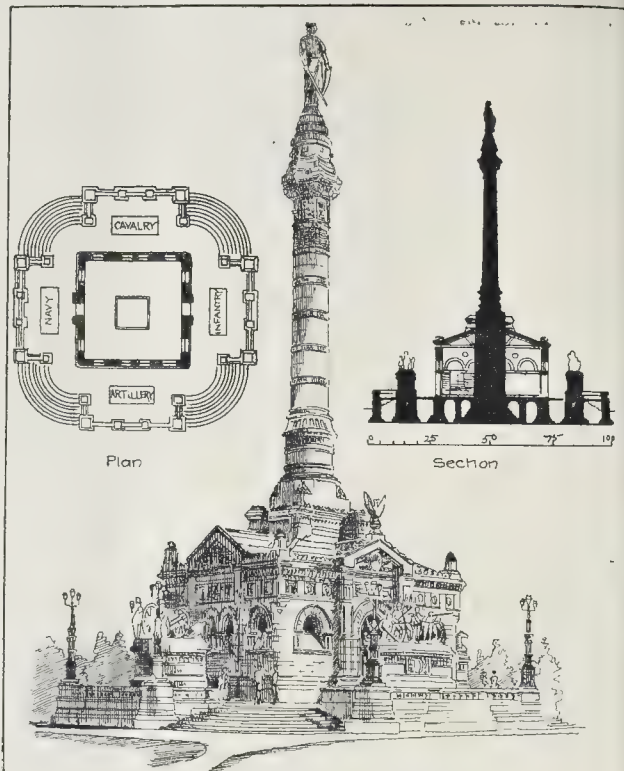
The groups are in bronze, but the illustrations were photographed from the plaster models in the artist's studio, under the disadvantage of restricted space which did not allow of an advantageous position for the camera, and hence a certain degree of unavoidable distortion in some of the figures.

The Artillery group "At Short Range" represents an actual incident in the battle field, when the man who had just withdrawn the rammer from the gun was shot in the heart and staggered back with his left arm over the gun for support and his right still grasping the rammer. The Infantry service is represented by "Colour Guard," and also records an actual incident in the war, which we give in the sculptor's own words:—

"At the battle of Resaca, the 103rd Ohio Infantry, charging in line, had carried the two outer lines of the enemy, and had been ordered to lie down in the abatis for a short rest, preparatory to the final charge over the main line. The brave colour-sergeant and the eight corporals forming the guard would not lie down, and were all killed or wounded. The sergeant, Martin Striebler, was of gigantic stature, and while waving the flag over the line, was shot with a bullet through the centre of his forehead, and had from twenty to thirty other wounds on his body. The tattered colours are now in the flag-room at the Columbus capital, and after twenty-seven years still retain the blood stains of the dead hero."

The Cavalry group, "The Advance Guard," represents a detachment that has struck the line of the enemy; we give the author's description again:—

"A trooper is still astride his horse



*Soldiers' and Sailors' Monument, Cleveland, Ohio.*

that has fallen with a bad wound. A venturesome Confederate soldier has noticed his predicament, and has made a rush for the guidon, but the cavalryman has whipped out his revolver, has given "Johnny Reb" one in the face, and is prepared for another shot. A Confederate officer has seized the rebel flag from the fallen bearer, and is cheering his men to the assault. A dismounted trooper in front, on one knee, is covering his man with his carbine. The bugler has been sent forward from the reserve by his officer to see how matters were progressing at the front. Finding them hard pressed and stubbornly trying to hold their ground, he has dismounted, and is sending back a bugle-call for assistance. The Confederate soldiers were introduced in this historical group to show to posterity what they and their flag were like."

The Navy group, "Mortar Practice," represents a scene near Island No. 10 on the Mississippi river, where an officer and five men are landing a mortar preparatory to shelling the intrenchments.

The statuary, as already observed, will be of cast bronze, the building and shaft of dark granite. The total height, to the top of the crowning figure of "Liberty," is 125 ft.; the base of the whole monument is 100 ft. square, and the building 40 ft. square; the pedestals on which the groups rest are 19 by 7 ft. The figures are about 8 ft. in height. The interior of the building will be marble, and will have coloured marble tablets on which will be engraved the names of the soldiers that were sent to the war of the rebellion from Cleveland, 10,000 in number. The total cost of the monument will be 100,000 dollars.

## DESIGN FOR A PUBLIC LIBRARY.

This design for a public library for a small country town, by Mr. W. Pywell, gained its author the Architectural Association medal for this year. We give the perspective view and the ground and first floor plans.

The following was the definition of the subject which was given to competitors:—"A

Public Library for a County Town.—On a corner site, the principal frontage measuring 100 ft., with a depth of 50 ft. down side street. Accommodation required:—Storage for books, porter's residence, and heating-chamber, &c., in basement; lending library, with space for 30,000 volumes, and a news-room, with small room off same for magazines, lavatories, &c., on ground-floor; reading-room, with accommodation for 20,000 volumes; small room off reading-room for librarian, and a committee-room on the first-floor. On the second floor should be placed residential chambers for the librarian and storage for books."

## HOUSE AT WIMBLEDON.

This house, designed by Mr. J. Ransome, stands on a corner site, facing the Malcolm and Worple-roads, at Wimbledon. The roof and walls (to the level of the first floor) of this house are hung with tiles taken off an old barn, which has been lately pulled down.

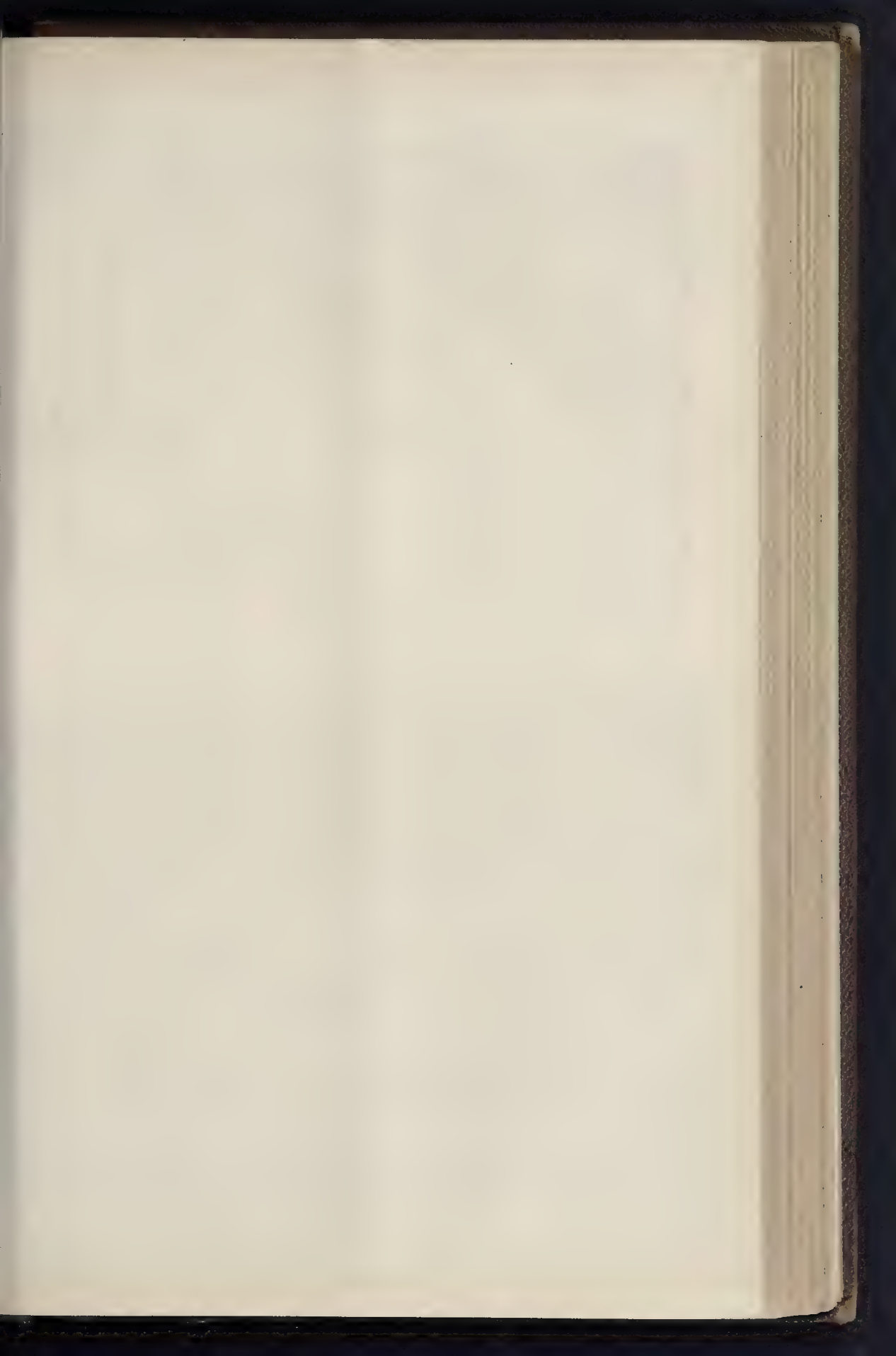
Owing to the age of these tiles the building has escaped the glaring red colour which is the chief defect in all new tile-hung structures. Below the level of the first floor the walls are of red brickwork, the mullions and transoms of the windows being in wood painted white. The dining-room and drawing-room open on to a verandah with a southern aspect. The surgery and dispensary are approached only from the lobby and have no communication with the rest of the house.

The large angle window, on the first floor, lights the morning-room, which is off the landing half-way up the staircase. Mr. Ernest Knight, of Morden, was the contractor.

## HOUSE AT SUTTON.

This house has been erected at Sutton, Surrey. The walls up to the first floor are hollow, and are faced with red bricks; the walls above and the roofs throughout are hung with Broseley tiles. The external woodwork has been stained dark brown, oiled and rubbed down; the hall being treated in the same manner. The casements throughout are of







"AT SHORT RANGE."



"ADVANCE GUARD."

SCULPTURE FROM THE SOLDIER

MR. L. T. S.





"COLOUR GUARD."



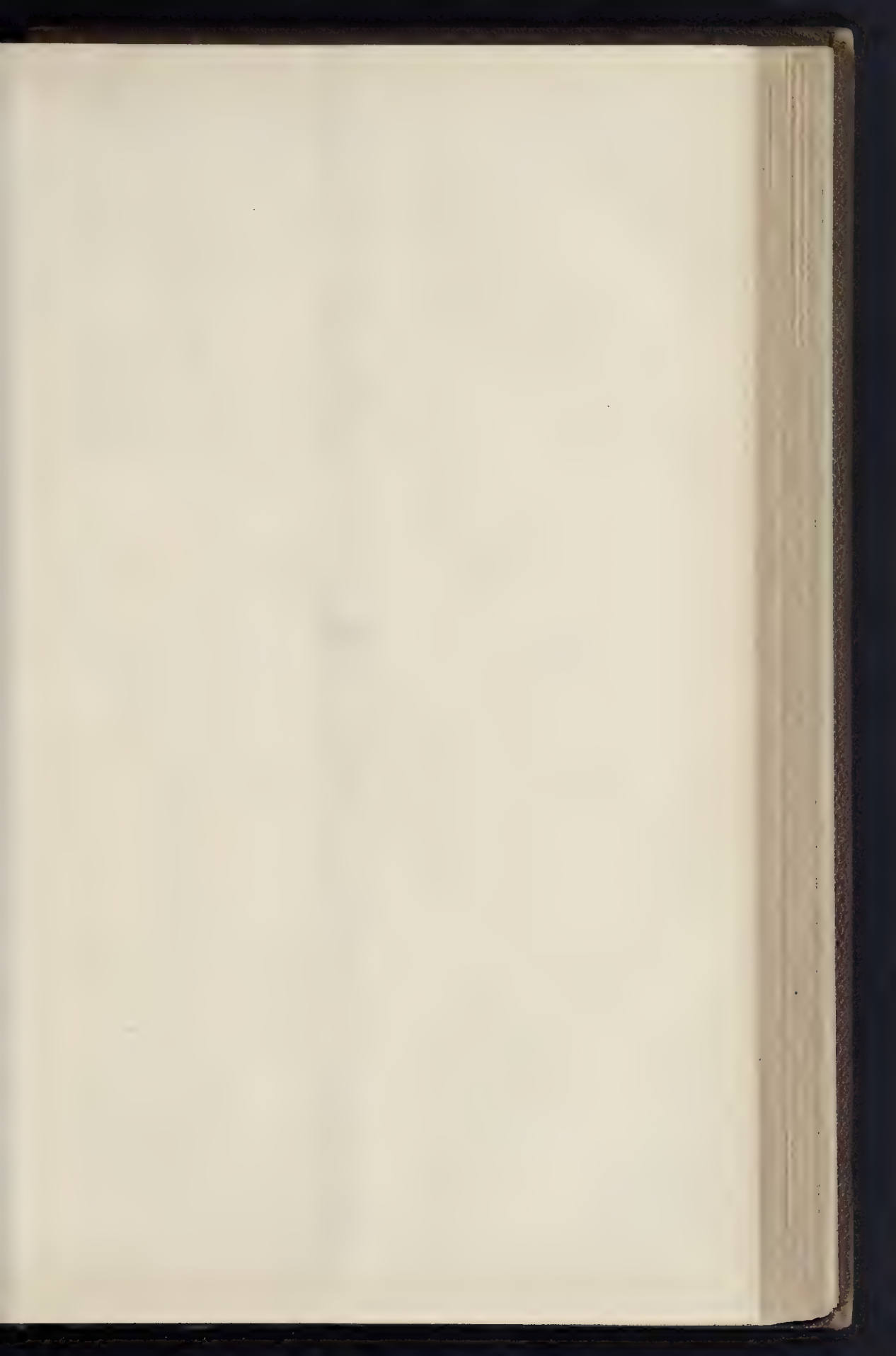
"MORTAR PRACTICE."

ERS MONUMENT, CLEVELAND, OHIO.

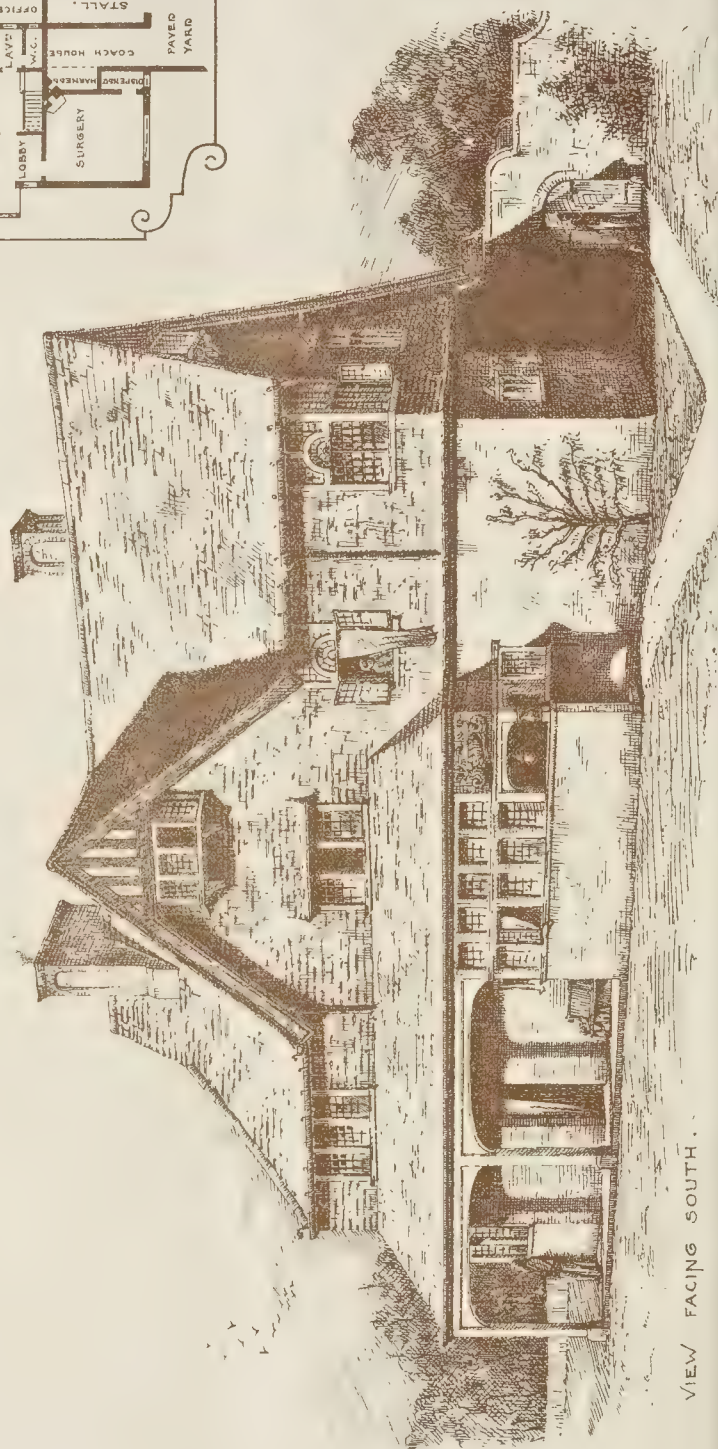
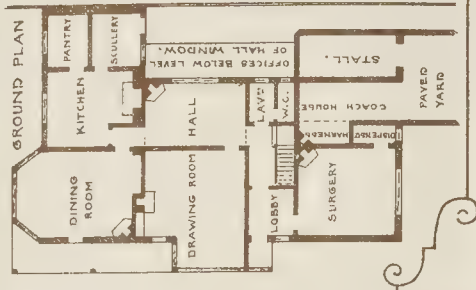
ACT AND SCULPTOR.







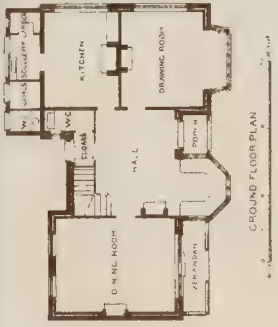
HOUSE AT WIMBLEDON, for  
W.H. FROME, YOUNG ESQ.  
JAMES RANSOME ARCHITECT



VIEW FACING SOUTH.



HOUSE AT SUTTON, SURREY.  
MR. R. A. BRIGGS, A.R.I.B.A. Architect.

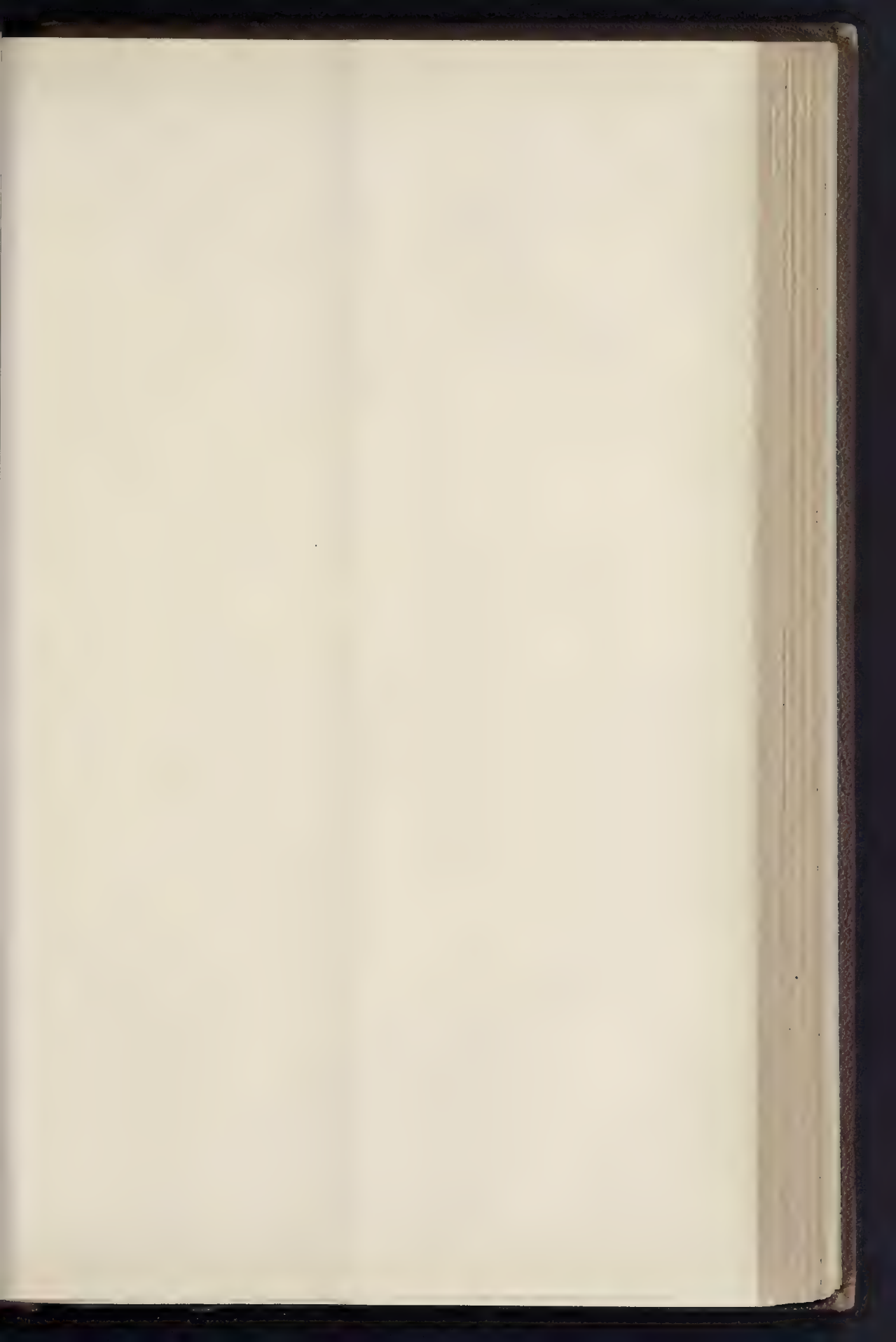


P. Briggs del.  
1890.

PROJ. AND SPAN. US 8 - 22 HARTING LANE, LONDON E.C.

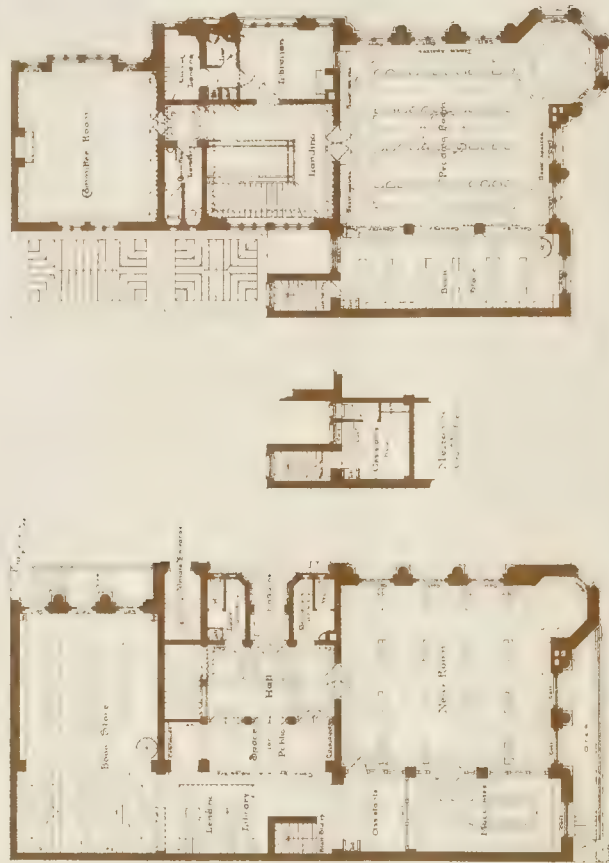






THE BUILDER, NOVEMBER 1, 1890

Book binding capacity. Volumes - Half and  
Leaves - Library 57,300 feet sq - 200,000 vol.  
Reading Room 2,30 feet sq - 2,000 vol.

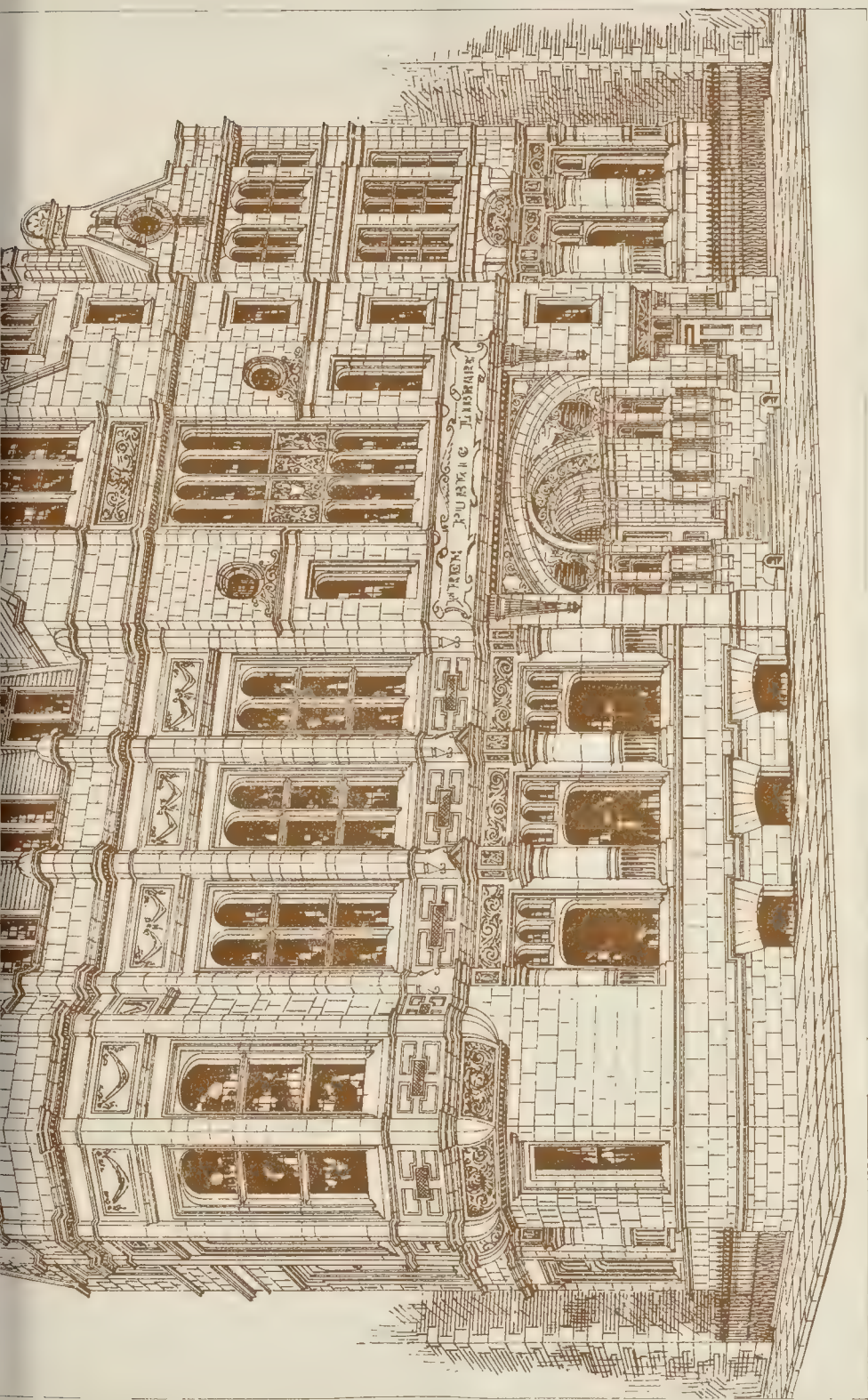


First Floor Plan

Ground Plan







DESIGN FOR A PUBLIC LIBRARY FOR A COUNTRY TOWN — BY MR. W. POWELL





wrought iron, with ornamental plates, and are filled in with leaded lights. The total cost of the house was under 700l.

The illustration is from a drawing by the architect, Mr. R. A. Briggs, A.R.I.B.A., which was hung in the last Royal Academy Exhibition.

#### THE ART CONGRESS AT BIRMINGHAM.

THE prospectus of the proceedings at the Art Congress at Birmingham next week has only just been finally arranged in all its details. The following is the list as it now stands; the sections referred to by letters of the alphabet are as follows:—

- A=Painting.
- B=Sculpture.
- C=Architecture.
- D=Applied Arts.
- E=Museums and National and Municipal Encouragement of Art.

#### Order of Proceedings.

**Tuesday, November 4.**—10 am., Meeting of Council, No. 1 Committee Room, Council House. 11 am., Mr. P. H. Rathbone, Presidential Address in Section E; Mr. J. Thackray Bunce on "Encouragement of Art by Municipalities;" Mr. T. Shirling on "Municipalities in their relation to Art Schools;" 2 p.m., Combined Meeting of Sections B and C; Mr. Roscoe Mullins on "Sculpture as Internal Decoration;" Mr. Ralph Nevill on "The Study of Local Architecture, especially for Schools of Art;" Combined Meeting of Sections A and D; Mr. Salsby on "Colour in relation to Internal Decoration;" 8 p.m., Inaugural Address by the President, Mr. J. E. Hodgson, R.A., at the Midland Institute.

**Wednesday, November 5.**—11 am., Mr. T. G. Jackson, F.S.A., Presidential Address in Section C; Mr. R. T. Blomfield, on "Architect and Artist;" Mr. H. H. Statham, on "Ancient Buildings and Modern Architecture;" 2 p.m., Section A; Papers by Mr. John Brett, A.R.A., on "Education in Art;" Mr. Stanhope Forbes (not fixed); and Mr. W. J. Wainwright, A.R.W.S., on "Some remarks on the English School of Water Colour Painting;" 2 p.m., Combined Meeting of Sections B, C, D, E; Mr. Heywood Sumner on "Advertisements;" Mr. T. R. Albett on "Architectural Drawing;" Mr. T. R. Albett on "The Drawing Society;" 8 p.m., Reception by the Mayor (Alderman Clayton) at the Council House.

**Thursday, November 6.**—11 am., Mr. A. H. Mackmurdo, Presidential Address in Section D; and Mr. Alfred Gilbert, A.R.A., on "Metalwork;" 2 p.m., Mr. Henry Holiday, on "The Figure in Design;" Mr. J. W. Toles, on "Art as applied to Jewellery and Personal Ornament;" 2 p.m., Combined Meeting of Sections A, B, C, E; Mr. James Crook, R.I., on "A Gallery of British Art;" 4 p.m., Reception by Royal Birmingham Society of Artists, New-street.

**Friday, November 7.**—11 am., Mr. G. Simonds, President, on "The Education of the Artist;" Mr. E. Onslow Ford, A.R.A., on "The Modern Education of Sculptors;" Mr. B. Creswick (Modelling Master Birmingham Municipal School of Art), on "The Relation of Sculpture to Architecture;" 2 p.m., Section E; Mr. William Kenrick, M.P., on "Technical Education as applied to Art Industry;" Mr. C. E. Ashbee, on "How can we foster Art at our Polytechnics?" 2 p.m., Combined Meeting of Sections A, B, C, D; Mr. Aston Webb, on "Architecture and Education in the Future;" Mr. F. G. Jackson (Master of Design Birmingham Municipal School of Art), on "Art Education in relation to Industry;" 8 p.m., Reception by Local Committee at Edgbaston Assembly Rooms.

**Saturday, November 8.**—11 am., Mr. W. B. Richmond, A.R.A., President of Section A, followed by the General Meeting.

There will be three Evening Lectures for Working Men, at 8 p.m., on Wednesday, Thursday, and Friday evenings, in the Large Lecture Theatre of the Midland Institute. They will be by:—Mr. C. K. Ashbee, on "Metalwork;" Mr. J. E. Storkie Gardner, on "Metalwork;" Mr. J. E. Hodgson, R.A., on "Art Books;" and Mr. Henry Holiday on "Glass."

The reception room will be in the Town-hall. The sections will meet in the large lecture theatre at the Midland Institute, and in the Council-chamber at the Council House; but we observe that the card of meetings sent out does not state in which of these two rooms each set of papers will be read; this is not very business-like, and the omission is likely to cause inconvenience to visitors.

Various local manufacturers will be open during the week to members of the Congress, including those of the Birmingham Small Arms and Metal Co.; Messrs. Elkington's Electroplate Manufactory; Messrs. Hardman's Stained Glass Works; Messrs. Hart Son & Pear's "Art" Metal Works; Mr. T. Moore's Die Sinking Medal and Seal Engraving Works;

Messrs. Osler's Glass-cutting rooms; Messrs. Webley & Sons' gun and rifle manufacturing; Messrs. Winfields, where tube drawing and metal rolling is combined with stained-glass work. But the great show of the year, among the accompaniments to the Congress, is the collection of the works of David Cox, got together with great pains by Mr. Whitworth Wallis, the energetic curator of the Art Museum, and which is such a representative collection of the great water-colour artist's work as probably will not be seen in one room again.

#### THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council took place on Tuesday, at Spring-gardens, Sir John Lubbock, M.P., in the chair.

**Improvements at Bethnal-green.**—Nearly the whole time of the Council was devoted to the consideration of a report of the Housing of the Working Classes Committee or a scheme for the improvement of a certain part of Bethnal-green. The following is the greater part of the report:—

"On July 19 last the Medical Officer of Health for Bethnal-green made an official representation to the Council under the Artisans and Labourers' Dwellings Improvement Act, 1875 (better known as Cross's Act), relating to an unhealthy area in that district, and on September 16 the Medical Officer for Shoreditch represented a small area in that parish immediately adjoining the Bethnal-green area. Since the representation relative to Bethnal-green was made, Cross's Act has been repealed, and your Committee have obtained a fresh representation under part I of the Housing of the Working Classes Act, 1890, which is practically identical with Cross's Act, except that some of the compensation clauses are a little improved. The representations were referred to the Medical Officer of the Council for report, and his report substantiates the statements as to the condition of the area contained in them. The representations from Bethnal-green and Shoreditch are dealt with as one in the report, as the officers of the Council advise that the reoccupancy and opening-up of the area in Bethnal-green are materially assisted by including the small neighbouring area in Shoreditch. Your Committee have at various times personally inspected the area, and were especially struck by the narrowness of the streets, the widest measuring only 28 ft. There is also a great difference of level between the streets and the floors of the houses, in some cases as much as 18 in., and the appearance of the inhabitants indicates to your Committee a low standard of vitality. In many cases there are no back-yards. The total area is about fifteen acres in extent, and is bounded on the north by Virginia-road and St. Leonard's churchyard, on the west by Boundary-street and High-street, on the south by Church-street, and on the east by Mount-street. The streets are twenty in number. The average population per room is about 2½, and 107 rooms have five or more inhabitants each. There are many small courts, of a very bad class. The area comprises 730 houses, of which 652 are occupied, wholly or partly, by persons of the labouring classes; the remaining 78 houses consist of 12 public-houses and beer-shops, 21 shops and factories, 2 registered lodging-houses (153 beds); and 43 empty houses. The population, exclusive of those in lodging-houses, is 5,966—viz., 3,370 adults and 2,596 children, who occupy 2,645 rooms subdivided as follows:—2,118 persons occupying 752 single-room tenements; 2,265 persons occupying 606 two-room tenements; 1,183 persons occupying 211 tenements of 3 or more rooms (781 rooms). Including those in the lodging-houses, the total number of persons of the labouring classes displaced will be 5,713. The above facts effectively remove any doubts as to the metropolitan importance of the scheme. The houses (mostly two-story dwellings) are generally small, old, and dilapidated. In many of them the ground-floor is situated below the level of the street pavement, which renders the lower rooms very damp. The floors themselves lie on the earth, and there are no damp courses. On the eastern side of the area are many ill-ventilated courts and narrow streets. The Medical Officer for Bethnal-green reports that 'a low condition of health prevails in the area, and that this is due to the bad condition of the houses, and bad arrangement of the streets and courts.' He further says that 'the lighting and ventilation of many of the houses are defective, and that a number of them are insufficiently provided with proper sanitary conveniences, inasmuch as the only access to the closet in the yard is through a dark, badly-ventilated cellar.' The opinion which has been formed by your Committee as to the condition of this area is fully borne out by the statistical evidence which has been adduced concerning it. The following striking figures are extracted from a report furnished by the medical officer of Bethnal-green. The deaths registered and relating to that part of the area situated in

Bethnal-green, being nineteen-twentieths of the total area, give the following rates of mortality. Those in Bethnal-green as a whole are also stated for the purposes of comparison:—

	Bethnal-green area (1886-88).	Represented area (1886-88).	Represented area (1889 only).
	Per 1,000.	Per 1,000.	Per 1,000.
General mortality	22.8	40.0	40.13
Deaths from zymotic diseases	3.7	7.9	10.71
Deaths from tubercular, &c. diseases	8.9	8.5	7.28

It is therefore evident that about twice as many persons die in this area each year as would die if the mortality were the same as in Bethnal-green as a whole. Your committee have made further inquiry as to the rate of infant mortality in the area as affording yet more precise evidence, and find that while in the four years 1886-89 in Bethnal-green as a whole an average of 159 deaths occurred annually among children under one year of age to every 1,000 births, in this particular part of Bethnal-green the average annual number of deaths of such children was during that period 252 to every 1,000 births. It will be seen that, whether judged by the general death-rate or by death-rates from those classes of diseases which are especially associated with unwholesome conditions, this area is pre-eminently one that demands a comprehensive scheme. The density of the population alone shows that some radical re-arrangement is necessary, in this area, consisting almost entirely of two-story houses, there are living 373 persons per acre, whereas over Bethnal-green generally, by the last census, the population is 168 per acre. The Valuer's estimate of the gross cost of the scheme is 371,000l., from which must be deducted the estimated recoupment of 106,000l. There must be added the Engineer's estimate of the cost of the new and widened streets, a sum of 35,000l., bringing the total estimated net cost of the scheme to 300,000l., which, reckoning on a loan for 60 years, becomes a burden to the ratepayers (including interest) of 14,000l. for the first year, a charge which will diminish each subsequent year. The great cost of the scheme has been carefully considered by your Committee, but they are of opinion that the large saving of life which may be expected as the result of the scheme more than compensates for the cost. Your Committee, in their report presented on April 22 last, dealt with the re-housing of people displaced under such a scheme as this, and expressed the opinion that they should, if possible, have some means of re-housing, however temporarily, some of those displaced. Your Committee have taken steps to ascertain what vacant land, if any, exists in the vicinity, and hope to embody the information obtained in a later report. It is not, however, the intention of the Committee, if the scheme is approved by the Council, to clear the whole area at once, but rather to deal with it in sections, and thus avoid the necessity of disturbing more than a limited number at a time. Your Committee draw the attention of the Council to the fact that October 28 is the latest day upon which the area can be dealt with under a scheme without a further delay, as Part I. of the Act of 1890 prescribes that advertisements must be published in three consecutive weeks in the month of November. Your Committee submit the following formal recommendations:—

(a) That, subject to the necessary estimate being submitted to the Council by the Finance Committee, as required by the statute, the necessary resolution under section 4 of the Housing of the Working Classes Act, 1890, be passed by the Council, and that the seal of the Council be affixed thereto.

(b) That the draft scheme submitted by the Committee for the improvement of the area referred to in the foregoing resolution, be approved, and that it be referred to the Committee to complete the scheme, and to take all the necessary steps for depositing and obtaining confirmation thereof."

Lord Compton, M.P. (Chairman of the Committee), in introducing the report, said that the scheme was the first big scheme brought before the Council by the Housing of the Working Classes Committee. The local authority had stated their distinct opinion that the whole area was unfit for habitation; and they had also informed the Council that in their opinion the area should not be dealt with except as a whole, that it was too large to be dealt with piecemeal, and that it should be considered a metropolitan and not a local improvement. The death-rate was very high, and in consequence of the insanitary condition of the whole area, two people had died, as compared with one who died in other parts of Bethnal-green. The Committee had very carefully inquired into the matter, and had come to a unanimous conclusion that the whole area was in a very insanitary condition; but as to the manner in which the area should be dealt with, there was a difference of opinion even on the Committee. The eastern part of the area was rather more insanitary than the western part; but the death-rate in the two parts was about the same. The matter could be dealt with under Cross's Act or Torrens's Act, or under both partly. A strong



opinion prevailed that the area should be dealt with as a whole under Part I of the Act, and as a Metropolitan improvement. They did not propose that the improvement should be carried out immediately by pulling down all the houses, for that would cause a great deal of misery; but that they should gradually put the whole area into a better state. With regard to the cost, he frankly admitted that 300,000*l.* was a large sum to ask for; but the matter was one of human life. He hoped the Council would act in no niggardly spirit. If they dealt with the area in small sections, they would be merely tinkering with the matter, and the scheme would have to be gone into at a subsequent date. An extraordinary amount of immorality also existed in this area, which was the inevitable result of its insanitary character. He concluded by asking that they might deal with the matter as a whole, and shed a little more purity into that part of London.

Mr. Watney moved as an amendment:—"That it be referred back to the Committee to report to the Council whether, under the Act of last session, the Council is not able to make the owners put their houses in a satisfactory condition without charge to the ratepayers." If the report was adopted, he said, the Council would be adopting a precedent which would involve them in great expenditure.

Mr. Maule seconded the amendment. If they agreed to the proposed expenditure, they could not complete the work throughout London under a cost of three hundred millions sterling.

Mr. Austin supported the recommendation of the Committee. The death-rate in the area referred to was 40 in the 1,000, or more than double the ordinary rate.

Mr. Beachcroft said he believed it was admitted on all hands that this was an unhealthy area. He thought that part of the area, the western, could be dealt with under Part 2., but not the whole.

Mr. Hutton, who opposed the scheme, said he thought the Council should set the local authorities in motion, and see that the buildings were put in a proper condition.

Dr. Longstaffe gave a number of statistics to show the terribly insanitary condition of the area.

Colonel Edis thought they should make the local authorities do their duty. The scheme offered a premium to those who kept unhealthy dwellings.

Lord Lingen said there were many points requiring consideration. He was entirely in favour of doing everything that was reasonable, prudent, and practicable in carrying forward the movement for the better housing of the working-classes. The amendment, however, for which he intended to vote, would give time to consider the proposals made by the Committee.

Mr. Boulnois, M.P., moved the adjournment of the debate.

Lord Compton opposed this.

On a division the adjournment was carried, and later on the Chairman said he had received a requisition to call a special meeting on Monday to consider the scheme.

**New Fire Brigade Station for Wandsworth.**—The Fire Brigade Committee recommended, and the Council agreed to accept, a tender of Messrs. Stimpson & Co. to erect, at a cost of 7,980*l.*, a new station at Wandsworth; and also that power be taken for the erection of a station on ground adjacent to Clapham Common.

The Council soon after adjourned.

**ARCHITECTURAL ASSOCIATION LYRIC CLUB.**—The opening concert of this club was held at the headquarters, Mona Hotel, Covent-garden, on Tuesday, October 23. A good programme was arranged by Mr. J. Douglas Scott, and conducted under the President, Mr. W. Burrell. The following members and friends contributed towards the entertainment:—Messrs. J. D. Scott, Pywell, Lidstone (violin), W. E. Johnson, S. B. Garcia, F. H. Collins, and C. D. Imhof (who again appears as accompanist). Any member of the Architectural Association wishing to join the club should write to the hon. sec., Messrs. W. Henry White and Theo. Moore.

**REMOVALS.**—We are asked to state that Messrs. C. S. Worsam & Co., wood-working machinery manufacturers, have decided to remove from Queen Victoria-street to the vicinity of their works, at 172, Burrage-road, Plumstead, S.E.—We are also asked to notify the removal of the City offices of Messrs. Colls & Sons, builders, from Moorgate-street to No. 5, Coleman-street.

## ARCHITECTURAL SOCIETIES.

**GLASGOW ARCHITECTURAL ASSOCIATION.**—The second lecture of the present session was given on the 21st ult. by Mr. Wm. Paton Buchan, on "The Ventilation of Buildings," in the Philosophical Society's Rooms, Bath-street, Glasgow, the President (Mr. Wm. J. Anderson) in the chair. Beginning with the chemical composition of air, and the quantity absolutely necessary for life and desirable for health, the lecturer compared these with tables of analyses made of the atmosphere found in theatres, churches, schools, and dwellings. Some experiments were made with a lighted candle to show the vitiation of air caused by our necessary illuminants. The lecturer then passed to a criticism of the practical methods that have been, and are, adopted to secure at once the admission of fresh and the extraction of foul air,—a problem that, simple as it may appear, was beset with difficulty if draught and the loss of all heat was to be avoided. Mechanical power was now more commonly employed than hitherto. For churches, however, automatic ventilation was, of course, much cheaper, and might be quite effectual. By diagrams the principal patent systems were illustrated, and their merits discussed. At the conclusion of the lecture a hearty vote of thanks was passed to Mr. Buchan.

## Correspondence.

To the Editor of THE BUILDER.

### CEMENT TESTS.

SIR,—I have frequently noticed in your valuable paper references to the Prussian standard rules on Portland cement (see p. 323, October 25, 1890), and as I have myself encountered great difficulty in finding out what these rules are, I have thought it might be of some interest to your readers to have a translation of them. The translation is made from an official copy supplied to me from Berlin. This copy gives at the same time instructions and explanations under each head, which I have not translated, so as to give the rules in a short and handy form, but if any of your readers should care to have them, I shall be glad to supply this information.

H. ALFRED ROECHLING.

23, Highfield-street, Leicester.  
October 24, 1890.

**Prussian Standard Rules for the Uniform Delivery and Testing of Portland Cement.**  
Circular of the 28th day of July, 1887.

**Definition of Portland Cement.**—Portland cement is a product obtained by burning an intimate admixture of substances containing, as chief ingredients, lime and clay, to clinkers, and afterwards grinding and pulverising the same.

1. **Packing and Weight.**—As a rule, Portland cement is to be packed in standard casks of 180 kilogrammes (= 354 cwt.) gross weight, and about 170 kilogrammes (= 354 cwt.) net weight, and also in half standard casks of 90 kilogrammes (= 177 cwt.) gross weight, and about 85 kilogrammes (= 186 cwt.) net weight. The gross weight is to be clearly marked on the outside of the casks.

If cement is packed in casks of different weight, or in bags, it is also necessary to show the gross weight in plain figures on the outside of the cask or bag.

Loss through leakage or differences in weight up to 2 per cent. cannot be claimed for. The barrels or bags must besides the weight bear on their outside, in plain letters, the name of the firm or the trade-mark.

2. **Time of Setting.**—Portland cement may be ordered either as slow or quick-setting, according to requirements. Cement that only sets in two hours or longer is to be called slow-setting cement.

3. **"Blowing" of Cement.**—Portland cement must not alter its volume, i.e., "blow." The following may be considered a decisive test. A cake of cement may be mixed on a plate of glass, and is to be protected from drying up whilst setting. It is then, after setting, to be submerged in water, and if, after twenty-four hours, it shows small beads on the edges, or cracks, it is to be considered a "blowing" cement.

4. **Fineness of Cement.**—Portland cement must be ground so finely that it leaves, when placed upon a sieve of 900 meshes per square centimetre (= 5,806 meshes per square inch, or 76 meshes per lineal inch), at the outside a residue of only 10 per cent. The thickness of the wire is to be equal to half the width of the meshes.

5. **Tests of Strength.**—The cohesive strength of Portland cement is to be tested in a mixture of cement and sand. The test, which must include both the tensile as well as the compressive strength,

is to be made in a uniform manner on specimens of equal shape and cross-section, and with machines of the same type.

It is advisable also to test the strength of neat cement.

The test for tensile strength is to be made on briquettes of a breaking area of 5 square centimetres (= 0.775 square inches), and those for compressive strength on cubes with sides of 50 square centimetres (= 7.75 square inches).

6. **Tensile for Compressive Strength.**—Slow-setting cement shall possess, when mixed in the proportion of three parts, by weight, of standard sand to one part, by weight, of cement, and after having been exposed to the air for one day, and placed under water for twenty-seven days, a tensile strength of at least 16 kilogrammes per square centimetre (= 227 lb. per square inch).

The compressive strength must at least be 160 kilogrammes per square centimetre (= 2,270 lb. per square inch).

In the case of quick-setting cement, the strength after twenty-eight days is, generally speaking, lower than that given above, and it is, therefore, necessary to state the time of setting as well as the strength.

## WHITEFIELD'S CHAPEL COMPETITION.

SIR,—Without wishing to enter into any discussion on the above, I shall be glad if you will kindly permit me to controvert Professor Smith's dictum, in his letter last week, that a domed ceiling is neither suitable nor safe where clear hearing and speaking are of the first importance. Really it is much to be regretted the Professor should give the weight of his name to a general statement of that kind. It depends entirely on the skill with which the dome is carried out, and no more beautiful or suitable covering for a large central area has ever been devised. Acoustically it has been successful over and over again. Let me instance only two examples in support of this,—the well-known St. Stephen's, Walbrook, and Union Chapel, Islington, the latter being practically a domed church. Both are about the size of that proposed in "Lux Mundi," and both are admirable for hearing and seeing. The question of cost has already been more than answered in Professor Smith's report, but I have always understood that,—within reasonable limits,—the great object is to produce good architecture, not cheap. The whole question is begged in this case by the limit of cost being unreasonable.

J. M. BRYDON.

5, Cambridge-place, Regent's Park, N.W.  
October 28, 1890.

SIR,—Professor Roger Smith's letter makes the result of the above more puzzling than ever. I therefore inquire—If Mr. Brydon's design was acoustically bad, and expensive that it could not be carried out within, or even very near, the limit of cost fixed, why was it awarded a premium?

JOHN JOHNSON.

## OBITUARY.

MR. J. MACLAREN.—The architectural profession has sustained a great loss by the death of Mr. James MacLaren, of 21, King William-street, which occurred on October 20. He will probably be chiefly remembered by his new work at the High School at Stirling. Among his recent works are a large hotel at Las Palmas, Santa Catalina, and a large number of works for Sir Donald Currie, for whom two houses are now being built from his designs at Palace-court, Kensington. Some "Additions to the Park, Ledbury," will be found illustrated in our issue of June 12, 1886; and a house and studio at Avonmore-road, October 13, 1889.

MR. R. A. LEDWARD.—The death is announced at the age of thirty-three, of the promising young sculptor, Mr. R. A. Ledward. During his three years' studentship at South Kensington he gained, amongst many awards, a gold medal for modelling, and was afterwards appointed a master of modelling in these schools. He had been an exhibitor at the Royal Academy for the last eight years.

A TALL TOWER FOR THE ISLE OF MAN.—The foundation-stone of the great tower to be erected at Douglas, Isle of Man, was laid on the 21st ult. by the Earl of Lathom. The tower is to comprise six floors, to be used severally as a theatre, dancing-saloon, concert-hall, bazaar, shops, and the top-most has an observatory. The tower will be as high as St. Paul's Cathedral, the estimated cost is about 80,000*l.*, and it is expected that it will be completed by the millennium of 1892. Mr. Floyd, of Westminster, is the engineer.

DEPARTMENT OF SCIENCE AND ART.—We are informed that the Government institution, now known as the Normal School of Science and Royal School of Mines, will in future be called the Royal College of Science, London.



## The Student's Column.

## HOT-WATER SUPPLY.—XVIII.

## IMPROVED AND OTHER SYSTEMS (continued).

**O**CASIONALLY advocates for carrying the primary flow-pipe direct from the boiler to the highest point in the house (constituting it both primary and secondary flow), and having the return pipes connected into the cylinder only, as fig. 43.

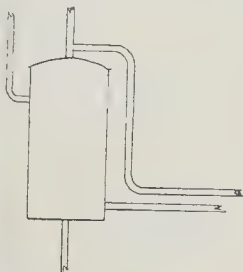


FIG. 43.

are to be met with. This is a practice that should only be resorted to on special occasions, as we have to bear in mind that the store of hot water in the cylinder has been all round, to except by the pipe which has been all round the house, and probably lost the major portion of its heat.

By this means, however, hot water is obtained at the taps very quickly, though it is a late hour before there is any in storage of a high temperature; but, as an instance of its successful application, might be mentioned the case of a large residence where trouble had always been experienced in obtaining hot water at the bath in the early morning, as the bath-room was situated a great distance from the kitchen (160 ft. run of pipe), and a considerable time was needed with an ordinary kitchen range boiler to get really hot water at this point, it having first to pass through the cylinder; a change was, therefore, effected, as fig. 43, and the trouble was at an end, as the hot water reached the bath-room in much less time, and, as the pipe was of great length, it held enough in itself for one bath without depending upon the reservoir; but this successful instance must not be construed into a recommendation of the method described.

Another arrangement of connecting-up the pipes to the cylinder and the boiler is as fig. 44, known as "Dyer's system." With this apparatus we must content ourselves with a description

with the secondary flow, as already explained. The cold supply is carried down and connected into the cylinder at the bottom, and is continued and connected into the boiler at the bottom also, and the secondary return is connected into the cold supply at a low point as shown.

A prevailing notion amongst the majority of hot-water fitters, particularly with some of the stubborn ones, who have been faithfully practising for years what they were taught in their boyhood, is that on no account must the flow-pipe descend anywhere in its course, nor must any circulating-pipe descend below the boiler; nor must, in fact, any pipe take a course that is irregular with the ascent of the flow-pipe and descent of the return which has become traditional, and from which a departure would be looked upon as an offence against all accepted principles.

In theory, several of the best authorities agree that under what we may term common circumstances a circulation can be effected about three-fourths the distance below the boiler that the circulation extends above it, as fig. 45, and the result is arrived at as follows:

—First, it is necessary to impress upon the mind that the circulation of water is brought about by the fact that cold water is heavier than hot, *not* that hot water is lighter than cold. This is a distinction with a considerable difference, so far as it affects this argument, for it can be seen plainly that heated water has no inclination to rise unless it is lifted or pushed, so to speak, by a superior force. If we take a vessel of warm water the contents will not rise out of it, but if we take an exactly equal quantity, by measure, of hot water and cold water, and place one in each pan of a pair of scales, we should then find that the pan of hot water would rise, for the simple reason that the superior gravity of the cold water caused it to do so. Now, in an apparatus as at fig. 45, when heat is applied to the boiler its contents become rarified, or lightened, and a circulation will set in as indicated by the arrows; if, in a short time, we apply the hand to the pipe, we shall find that, starting from the top of the boiler, the pipe is of a less and less temperature as we pass round it towards the bottom of the boiler (in the direction indicated by the arrows). The difference in temperature may be due to two causes, firstly, loss of heat by radiation from the pipes, which, of course, is greater the further we get from the starting-point, and, secondly, the boiler may not have had time to heat up the whole of the contents of the apparatus to boiling-point (for we cannot have a uniform heat everywhere in a circulating apparatus until this temperature is reached, which seldom happens), consequently this makes plain to us that the pipe which ascends from the bottom of the apparatus up into the boiler has the coldest and heaviest water in it, and this is the obstacle that more or less interferes with a good circulation being effected below a boiler. If the lower part of the apparatus extends a greater distance below the boiler than the upper part extends above it, we are given to understand that no circulation will take place, and although this is not strictly correct, it cannot be practically applied in hot water supply work, and, what is more, it is but very rarely required.

It very frequently happens that a fitter would find it very convenient if he could make a dip in his flow- (and return-) pipe, as fig. 46,

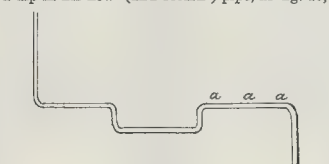


FIG. 46.

for instance; but, according to all accepted ideas, it would possibly ruin the apparatus, but this is not the case, although it might give a good deal of trouble. The trouble experienced in this instance is the difficulty in dislodging the air from the upper part of the service, *a a a*, for it will be found that in such a place the air will remain with the greatest persistency, and to remove it effectually an air-cock would have to be provided for periodical use, as, although we may allow the air to escape when first charg-

ing the apparatus, it does not wholly overcome the difficulty, as there is always a certain amount of air carried into the pipes with the water, and this will collect at any such point and require removing regularly, which we cannot expect servants to do. If it was not for the collection of air at this point, there would be no objection whatever to dipping the flow-pipe in the manner indicated, as it would be found that a dip of a few inches only would make no appreciable difference in the circulation.

## GENERAL BUILDING NEWS.

**ST. MARY'S CHURCH, SOMERS TOWN.**—This church was re-opened on Saturday, October 25, after being closed three months for repairs and improvements. The building was originally erected in 1826 by the brothers Inwood, the architects of the neighbouring church of St. Pancras, at a cost of 13,000*l.*, and, with the aid of immense galleries, was estimated to hold nearly 2,000 persons. That its extreme badness was recognised even by contemporaries is proved by a long notice in the *Gentleman's Magazine* for 1827, in which it is described as "the worst specimen of carpenter's Gothic yet erected in this country." The first attempt to bring about some improvement was made two years ago, when a ritual chancel was constructed by raising the floor, and a small apse thrown out, under the superintendence of Mr. Ewan Christian, F.S.A. In the present alterations the galleries have been entirely removed, the walls and roof painted, and to some extent decorated, and new systems of lighting and heating introduced. The long, two-light windows have been broken by the introduction of a band of stone tracery at the level of the old galleries, thus enabling the memorial windows to be worked into their old positions. A set-off under the galleries has been made to carry the line of this tracery band round three sides of the church by means of a moulding and cresting. The piers consisted of thin iron cores surrounded by four three-quarter shafts of wood, and crowned with hideous spreading capitals. An attempt has been made to improve their character by inserting a nail-head moulding between the shafts, and to substitute good Early English types for the "fungoid" caps of the original work. The limited funds at the disposal of the committee were seriously encroached upon by the necessity of removing and making good to the large quantity of bond timber built into the walls, and the whole work would have been greatly hampered had it not been for the generosity of an anonymous benefactor who made up the deficit. The architect is Mr. Reginald Colebrooke Reade, M.A., of Torquay.

**NEW CHURCH, CHAPELKNOWE, GUY'S GREEN.**—A new United Presbyterian church has just been opened by Principal Cairns at Chapelknowe. The new building is built of stone, accommodates over 200 persons, and has a lofty, open roof. The acoustic and ventilating properties are said to be excellent. Mr. Geo. Dale Oliver, of Carlisle, was the architect.

**A NEW BANK FOR LEEDS.**—A new branch bank about to be erected for the Birmingham and Midland Bank at Leeds will be situate in Kirkgate, on the south side, and immediately opposite to the Market. The façade will have a frontage of 41 ft. and an elevation 55 ft. in height, which will be executed in stone. The walls of the interior are to be lined with Italian marble; the floor will be paved with mosaic work; the ceiling of the bank richly panelled; and the whole of the counters, desks, and fittings will be of solid walnut. The safes and the voucher-rooms are to be placed in the basement and made fireproof with brick vaulting. The private office, lavatories, and the caretaker's rooms are to be placed on the first floor. The design has been prepared by Mr. William Bakewell, architect, of Leeds, and will be carried out under his superintendence. The work has been let to Messrs. Nicholson & Son, Heavyside, Barrand, Moore, and Bateman.

**ST. JOHN'S CHAPEL, CROOKES MOOR, SHEFFIELD.**—A new Wesleyan chapel in Crookes Moor-road, Sheffield, was opened on the 22nd ult. The chapel is in the Gothic style of architecture. The principal entrances are from the Crookes Moor-road, with a side entrance from Dam-road. In addition to the chapel, which has sittings for 800 persons, there are two large school-rooms, one over the other, and connected by a staircase, around which are clustered on the different levels vestries, classrooms, and committee-rooms, a large band-room, an infants' school, and a ladies' room. The work has been done by the following tradesmen:—Masonry, Mr. J. Fidler, Eokington; joinery, Messrs. W. Crookes & Son, Sheffield; slating, Mr. W. J. Tune; plastering, Messrs. Carter, Unwin, & Son; plumbing and gasfitting, Mr. J. B. Corrie; glazing, Mr. H. Sutton, Birmingham; painting, Mr. C. Chadwick; carving, Mr. F. Tery; warming apparatus, Messrs. J. C. & J. S. Ellis. The pulpit has been erected by Messrs. Johnson & Appleby, from the architect's designs. Mr. C. J. Innocent, of Sheffield, is the architect, and the clerk of works is Mr. George Malpas.

FIG. 44.

FIG. 45.

only, as it does not come within the province of these papers to discuss the merits or demerits of individual systems. It will be noticed that in this the primary flow has communication



**HOLBORN TOWN HALL.**—The London County Council having required additional exits to be provided at the Holborn Town Hall, a new staircase has been constructed at the eastern end, leading into a corridor on the ground-floor, opening into the Clerkenwell-road. New retiring-rooms for gentlemen have also been built on the ground-floor, and for ladies on the first floor, in connexion with the great hall. The principal staircase has been reconstructed in grey and white marble, by Messrs. Farmer & Brindley, of Westminster Bridge-road. An improved system of ventilation has been carried out by Mr. Papier, of Islington, in the great hall, the committee-room, and the residential portion of the building. The whole of the interior of the building has been redecorated by Mr. John Crossley, of Newark. It is proposed to establish an installation of electric lighting in the building. The structural works have been executed by Messrs. Kilby & Gayford, of Worship-street, Finsbury. The work has been carried out under the superintendence of the architects, Messrs. L. H. Isaacs & H. L. Florence.

**THE NEW FARRINGTON FRUIT MARKET.**—The first stone of the new fruit and vegetable market, in Farrington-road, was laid by the Lord Mayor on the 22nd ult. The building, which will be erected at the corner of Charterhouse-street and Farrington-road, is designed of iron and glass, and the site embraces an area of about 54,000 ft., with a frontage of 166 ft. to Charterhouse-street, and 184 ft. to Farrington-road. The main vehicular and footway entrance to the new building will be in the middle of the Charterhouse-street front, and will be 35 ft. wide. A further entrance, 14 ft. wide, for carriages and pedestrians, will be placed at the north end of the Farrington-road front. Two footway entrances are provided on the Charterhouse street front, and one on the Farrington-road front, all three affording access to gangways of similar width, traversing the market from south to north and west to east. The height of the building to the platform level will be 23 ft., and to the ridge 45 ft. The basements and the adjoining markets will be occupied by the Great Northern Railway Company. The area of these basements is about 100,000 ft. Large hydraulic lifts are designed to raise the produce to the market, and inclined railways for horse traffic are to be provided as means of access from the basement to the street level. The design is by Mr. Alexander Peebles, the City Architect. The contract for the substructure and basement works has been taken by Messrs. Rudd & Son, of Grantham, at 41, 97/3d. The estimated cost of the superstructure is 15,500/.

**NEW CHURCH, NORTHINGTON.**—The new church of St. John the Evangelist, situated on the slope of Northington Down, was consecrated by the Bishop of Guildford recently. The church, which is Late Gothic freely treated in detail, was designed by Mr. T. G. Jackson, M.A., and consists of nave, chancel, tower, and north aisle. It has been erected principally by the estate workmen, and under the superintendence of Mr. Thomas Potter. The walls are of Portland cement concrete, those of the tower being 4 ft. in thickness, faced externally with flint-work and Chilmark stone dressings, and Caen stone internally. The flintwork is laid in panels of various designs. The rapid fall of the ground allows of a vestry below the chancel, which takes the form of an octagonal chamber vaulting from the chancel, from which, with a central pillar, from which hang a series of stone ribs with panels of red-rubbed bricks and stone in bands, spring to the side walls. The chancel terminates in an apse, and contains six two-light windows which are filled with stained glass executed by Messrs. Powell, of Whitefriars. The windows are pointed, with stone mullions. Each of the twelve lights contains the figure of an Apostle. The seating throughout the church is of black American walnut; the nave seats have traceried ends, and carved panels containing heraldic and other devices. The chancel stalls have high backs and canopies and carved standard ends, in which are introduced figures of the four Evangelists. The wood work generally, including the organ case is of the same material, rich in tracery and carving, and overhangs the stalls on the north side. The pulpit is of Caen stone. The reredos is alabaster, with a panel representing the Last Supper, under a canopy with carved and pierced cresting. The chancel is paved with marble mosaic. The tower is principally of Chilmark stone with flint panel inlays. It consists of two stages, the upper of which is lighted on each face with two tracery-headed louvre windows, 24 ft. in height, a parapet of tracery work surmounting the whole. From each angle springs a pinnacle with crocketed spirelets. The wood work generally, including the nave seats, chancel stalls, and organ case, was made in the estate workshops by the estate workmen. Messrs. Farmer & Brindley executed the carving and pavement of the chancel, the reredos, and font. Messrs. Hart, Son, Peard & Co. made the lectern. Haden & Son's hot air arrangements. The total cost has amounted to nearly 15,000/; the seating accommodation, including choir, is for 500 persons. We gave a view of the church in the *Builder* for June 21, 1890.

**NEW MISSION CHURCH, ROMFORD.**—On the 23rd ult., the new Mission Church of St. Alban's, Rom-

ford, was dedicated by the Bishop of St. Alban's. The church occupies a site at the upper part of Victoria-road. The designs have not yet been entirely carried out, but when completed the church will consist of a nave, 43 ft. 6 in. by 27 ft., a chancel and sacristy, 25 ft. by 17 ft., a south porch, a clerestory and vestry on the north side, with a *châpelle* at the east end of the nave. The vestry, porch, and spire are the portions which remain to be added. The cost of the whole design is estimated at about 1,200/.

The architect is Mr. James Kennedy, of London, and the builders are Messrs. Dowling & Davis, of Romford.

**NEW HOSPITAL FOR BROMSGROVE, NEAR BIRMINGHAM.**—The foundation-stone of a Cottage Hospital, which is to be erected on the New-road, Bromsgrove, was laid on the 22nd ult. by Mr. John Corbett, M.P. The buildings will consist of a central block and two side wings connected by corridors. The wings will form the male and female wards respectively; they will be 35 ft. by 15 ft. 6 in. by 12 ft. 6 in. in height, and they will each have six beds. The material used will be red brick, with pressed bricks for certain portions, and stone will be used for the main entrance and certain of the windows. The gables will be finished in the half-timbered style, and the whole of the roofs will be covered with purple Staffordshire tiles. The floors of the ward and the corridors will be of wood, those of the wards being laid double. The central hall will be warmed with hot-water pipes, and special arrangements are to be made for ventilation and lighting. The builders are Messrs. J. Brazier & Son, of Bromsgrove. The architect is Mr. John Cotton, of Birmingham and Bromsgrove.

**NEW CHURCH, CANTERBURY-ROAD, S.E.**—The Bishop of Rochester, on the 22nd ult., the new Bible Christian Chapel, Miskin-street, Cathay, Cardiff, was opened on the 22nd ult. The building, which will seat about 600 persons, has cost over 2,000/.

The architect was Mr. J. F. Pawcner, of Newport, and the builder Mr. L. E. Purnell, while Mr. M. M. Blake acted as clerk of the works.

**NEW CHURCH, CANTERBURY-ROAD, S.E.**—The Bishop of Rochester, on the 22nd ult., the new Bible Christian Chapel, Miskin-street, Cathay, Cardiff, was opened on the 22nd ult. The building, which has been erected by Corpus Christi College (Cambridge) in connexion with their Mission at Camberwell. The building consists of two floors, having a large hall, &c., on the ground-floor and a church on the first-floor. The church is distinct from the other part, and is approached by two wide stone staircases with direct access to the street. The building has treproof floors, and has cost nearly 5,000/.

The architect is Mr. Richard J. Lovell, A.R.I.B.A.

**THE ENLARGEMENT OF STAMFORD-HILL SCHOOLS.**—We understand that the Tottenham School Board has instructed the architect, Mr. Bell, to prepare designs for the enlargement of the Stamford-hill Schools for 500 children.

**NEW SCHOOL FOR ABBEYDALE.**—A new school which has been erected by the Sheffield School Board, at Abbeydale, was opened on Monday last. The building is two stories high. Coursed wallstone is used on all sides of the school, with Caen stone dressings, and the roof is of slate. Pine is applied for all interior woodwork. Accommodation is provided on the ground floor for 420 boys, and on the upper floor for 420 girls, one class-room being fitted up for cookery instruction. Wood block flooring is laid, and the interior is well lighted, warmed, and ventilated. The contract for the building, including boundary walling, is 5,770/.

The contractors for the work are Messrs. Thomas Lowe & Sons, of Burton. The architect is Mr. C. J. Innocent, F.R.I.B.A., of Sheffield, and Mr. J. Laidler has acted as Clerk of the Works.

**CHURCH RESTORATION NEAR CARDIFF.**—We are informed that the restoration of Peterstone-up-Ey Church, for which a faculty has been granted, has been entrusted to Messrs. Kempson & Fowler, architects, of Llandaff. The work includes a new solid oak chancel, arch screen, and pulpit, new oak chancel seats, new two-light chancel window, the raising of the east window and filling both with painted glass, new mosaic floor in chancel, and the wall decoration of same, a new heating apparatus, and the restoration of the tower, &c. The painted glass is being executed by Messrs. A. Savell & Co., London, and the screen and pulpit by Mr. Wm. Clarke, of Llandaff. The old tower of Llanishan Church, near Cardiff, has also been restored under the superintendence of Messrs. Kempson & Fowler. The work has been carried out by Mr. G. Hartnell, builder, of Crews-road, Cardiff.

## SANITARY AND ENGINEERING NEWS.

**THE NEW ROYAL INFIRMARY, LIVERPOOL.**—The heating and ventilation, as well as the steam and hot-water service supplies for this building have been carried out by Mr. Wilson W. Philson, Mem. Inst. C.E., who was selected, in a limited competition, prior to the contract for the building being given out. By this means the architect, Mr. Alfred Waterhouse, R.A., was able to devote much time and attention to the subject, and to embody all details of the scheme in his plans. The heating is by low-pressure steam, the water of condensation being returned to the boiler-room after having passed through the several systems of heating mains

and radiators, being finally put into the boilers by means of a Worthington steam pump. Two 50-h.p. Galloway steam-boilers are provided for this and the other services. They are set on the Livet principle, and are fitted with all the latest improvements, in order to ensure an economical cost of annual maintenance. Six service-pipes are taken from the main connecting the two boilers, No. 1 being for heating, No. 2 for the kitchen and ventilating coils, Nos. 3 and 4 for the laundry, No. 5 for the pumping service, and No. 6 for the disinfecting apparatus. On each of them stop-valves are fixed, by which means all these services are under the control of the engineer in the boiler-room. The supply-main for heating, which is 4 in. in diameter, is carried in the pipe-tunnel constructed below the corridor of communication running east and west. At the intersection of this corridor by the several blocks, an outlet is led in the main, fitted with a stop-valve, and reducing pressure valve for the supply of steam to each block. By this means, while still retaining the boiler pressure in the main pipe, in order to overcome the loss of pressure caused by the great distance the steam has to travel, the supply for heating and in circulation over each ward is delivered through the reducing valve at any pressure required to meet the variation of the external temperature. By this arrangement, it is found that the steam in the most distant or west wards can be circulated through the radiators at a pressure of from 3 lb. to 5 lb. on the square inch. It will thus be understood that though all the blocks are connected to the one steam supply from the boilers, they are independent in their operation, and the main steam supply to the supply and return mains leave and re-enter the main tunnel above referred to. The mains are of the best quality of steam-pipe, faced flange-joints being used for all pipes over 2 in. in diameter, while right and left screw joints are used for pipes of 2 in. and under. In all cases due allowance is made for expansion at the joints, and the pipes are made for the frequent use of long and easy bends, and swinging the mains where necessary. By this practice the disadvantage of telescope or other forms of expansion joints is avoided. In order to estimate the extent of this apparatus, it may be mentioned that over 13,000 superficial feet of steam and hot-water mains have been coated with Messrs. Lacey & Co.'s non-conducting composition, and in addition to this there are 6,000 superficial feet of branches that are not coated, while the direct heating surfaces fixed throughout the building are estimated at 8,000 square feet. The heating of the building throughout is by means of steam radiators, now known by the name of "Sunbeam," and the main supply by Messrs. Langden & Co., of Sheffield. The advantage of these radiators is that the loops are connected to the base by a Whitworth screw joint, and all parts of them are interchangeable; therefore, should a loop be accidentally broken, no trouble is experienced in renewing the same while the radiator is in position. In the wards the radiators are circulated by means of a central position. The heating in all cases is from the centre, because it is found in practice that it causes less disturbance of the atmosphere in the wards than when the radiators are placed against the external walls. The heating from the central position causes a current of warm air down the side walls. To all the circular radiators the supply of steam is provided by the central position, and the heating is from a fixed upon has been calculated to ensure, in conjunction with the open fire-places, during the winter months a mean temperature of 61 deg. Fahr., with an amount of air admitted through the radiators and from other sources equal to the entire renewal of the atmosphere in the wards four times in the hour. The fireplaces in the wards are also central, and constructed to form the main up-cast shaft for the extraction of the vitiated air. The flues from the fireplaces are carried up in iron pipes, quadruple on plan, each stack serving for four fireplaces and the extracting shaft. By this means a simple system of extraction is obtained by utilising the waste heat from the fire, the area of the area of outlet for smaller wards being 6 square feet, and for the large wards, through two central fireplaces, 12 square feet. In each outlet the gratings fixed are provided with check valves. In the other departments of the building inlets and outlets are constructed, but in these rooms the up-cast shaft is not required. The air, where they are collected and conveyed by means of a main trunk into the general extract shaft situated over the central block. In this shaft steam coils are fixed so as to ensure in all seasons a powerful up-cast. The hot-water supply to baths, sinks, and lavatories is obtained by means of four steam heaters with cylinders attached, the horizontal coils being of 3 in. cast-iron galvanised pipe, with all rising mains and branches of steam galvanised pipe. Valves are fixed on all branches, so that, in case of repair to pipes, no interruption will take place in the general supply. In order to economise fuel, the condensed-water mains are passed through the heaters before being returned to the boiler-room. For the administration block a direct branch, with valve and reducing-pressure valve, is taken from the main steam supply, for heating, ventilation, and hot-water service supplies.



**THE SKIPTON WATER SUPPLY.**—A statutory meeting of the members of the Sipton Local Board was held on the 22nd ult. for the purpose of considering and deciding upon the expediency of promoting a bill in the next session of Parliament for an extended water supply. The Chairman read and explained the scheme as proposed by Mr. Hill, the Engineer, which provided for the construction of a reservoir at Skibden capable of holding 40,000 gallons of water, which, together with the purchase of land, &c., would cost not more than 40,000l. Resolutions were passed in favour of the scheme.

**WEYMOUTH HARBOUR.**—We briefly mentioned in our issue for the 18th ult. the ceremony of laying the final stone in connexion with the new quay. We omitted to state then in connexion with the improvements to this harbour that an amount of about 40,000l. had been expended under the directions of Mr. Barlow-Morgan, Civil Engineer.

#### STAINED GLASS AND DECORATION.

**NEW WINDOW, PRIORY CHURCH, CHRISTCHURCH, HANTS.**—The old Priory Church of Christchurch, Hants, which dates back to early Saxon times, has received another stained glass window, the gift of Mrs. Bush, the wife of the present vicar. The window consists of three lights with tracery above, and represents "St. John taking the Blessed Virgin home," "Mary at the feet of Jesus," and the calling of St. James and St. John. The work has been designed and executed by Messrs. Mayor & Co., of Munich and New Bond-street, London.

**NEW STAINED GLASS WINDOWS FOR MANCHESTER CATHEDRAL.**—On the 22nd ult. in the north aisle of the Manchester Cathedral, two stained glass windows were presented to the authorities of the Cathedral by Miss Pickup. They are the two last in the north aisle which remained plain. The easternmost is dedicated to the memory of George and Elizabeth Pickup, father and mother of the donor, and that next to the porch is in memory of Mr. James Pickup. The work has been carried out by Clayton & Bell, of London. There are small figures in the principal lights formed by the upper tracery, and the main portion of each window is divided by the mullions and transoms into eight lights, in each of which is a figure illustrating some Biblical or sacred subject.

#### FOREIGN AND COLONIAL.

**FRANCE.**—An international fine art exhibition is to be opened, on February 18, 1891, at the Place Bellecour at Lyons. The committee for the industrial exhibition at Lyons in 1892 have awarded MM. Bordeau, Mignan, & Maistrasse, architects, of Paris, the first premium in the competition for the extension building. Baron Alphonse de Rothschild has presented to the museum at Bordeaux an important series of medals executed by M. Ringel d'Ilzsch.—M. Guillaume, the architect to the Louvre, has discovered in the Pavillon de Flore, in the rooms formerly occupied by the Prefecture of the Seine, a number of medals, probably from some town in the South of France, but of which nothing certain is known. They had been sent before the war to the architect Lefuel.—A group of French capitalists have formed a scheme for opening next summer, at Buda Pesth, an industrial exhibition organised on the model of the French Exhibition of 1889. M. Adolphe Schneider, witness of Louis Schneider, the engineer, has left a sum of more than 100,000 francs to the Association of Painters, Sculptors, Architects, and Engravers.—The Société des Artistes Français has been authorised to accept the legacy left to it by Heilbuth, consisting of a house, 47, Rue Ampère, Paris, valued at about 250,000 francs.—The Municipality of Rouen proposes to celebrate next year the centenary of the birth of Géricault, the painter, who was born there on September 26, 1791.—The Municipal Council of Chambéry have opened a subscription for the erection in that town of a monument commemorating the annexation of Savoy to France in 1792.—At the little town of Aulnay a monument is to be erected to the memory of a brave woman, Marie Biard, who during the Franco-German war many times traversed the Prussian lines at the imminent risk of her life, in order to carry despatches to the French army. In the commune of Colombiers there are plans to be commenced shortly the works necessary for conducting the Paris sewage, by lifts established at Clisby, into the forest of St. Germain and the plain of Achères, where they are to be utilised for agricultural purposes. This operation, often spoken of, has now received the sanction of the Government, and public subscription has been opened for the erection at Carpentras of a statue to the celebrated chemist François Raspail, who was born in that town in 1794. The sculptor is not yet selected.—A new line of railway has been opened from Montauroux to Grasse (Alpes Maritimes) which is to unite Nice, for strategic purposes, with Grenoble, Toulon, and Marseille.—The French Government intends to erect at Navarino a monument in commemoration of the celebrated Naval victory gained there over the Turks, in 1827, by the combined fleets of England, France and Russia. The monument will stand by

the seashore, and will be nearly 40 metres in height.

**NORWAY.**—Seventeen designs have been received for the new Historical Museum to be built in Christiania.—The new theatre building in the capital is now approaching completion. It will seat about 1,000 persons.—A few years ago a Norwegian architect, who takes great interest in Norse architecture, purchased the Haaves church, in Sögu, on the west coast of Norway, and one of the oldest in the country, for the sum of 232. He has since expended some 500, and a great deal of labour in restoring the church, and furnishing it in accordance with its date.—The first venture in cement manufacture in Norway, to which we recently referred, seems likely to be a success. At some trials the other day in Christiania by a body of experts, the Norwegian material is said to have proved quite equal to English briquettes in quality.

**SWEDEN.**—It is proposed to obtain a State grant of 8,500l. towards sending Swedish architects and engineers to the forthcoming Chicago International Exhibition.—New barracks for the accommodation of the Swedish Life Guards are to be erected in Stockholm.—The designs have now been completed for the Museum of Northern Antiquities to be erected in Stockholm, and the work will be commenced next spring.—In the town of Helsingborg there has just been completed a Masonic hall at a cost of 13,000l.

**DENMARK.**—Work is now in full progress with the erection of the new great central electrical station in Copenhagen. It is estimated to cost about 75,000l.

**THE WATER SUPPLY IN EGYPT.**—It is stated that Mr. Cope Whitehouse has renewed his application for leave to carry out the Raiyan project. He offers to deliver water in sufficient quantity to double the available volume during low Nile for 700 per million cubic metres of water delivered at Cairo, with a right of purchase of the canal and reservoir by the Egyptian Government at one million pounds. He insists that the Egyptian Government has no legal right to prevent the execution of the proposed works as a private enterprise.

#### MISCELLANEOUS.

**DOVERIDGE HALL.**—On October 23 last, at the Mart, the Doveridge Hall estate was bought in at a bid of 170,000l. Owned by Lord Waterpark, this property extends over 2,000 acres, and includes East Lodge (a hunting-box occupied by Lord Waterpark), Cavendish Lodge, fourteen farms (chiefly dairy land), several cottages in the village, a water corn-mill, with several small holdings. The annual rental amounts to 5,750l. The mansion, now tenanted by Lord Hindlip, was built in 1763, in the Classical style, of red brick with stone dressings. The main front, between two low wings, has a rustic ground-floor, supporting a two-storied pediment with four pilasters, and two (central) columns partly engaged, in the Ionic order. The Hall is distant one mile and a half eastwards from Uttoxeter, whence the main road to Derby traverses the estate, which is bounded along its western side by the Dove. Nine miles northwards lies Ashborne, famed for its neighbouring beauties of Boreford Dale and Dovecote, and for its own parish church of St. Oswald. Samuel Johnson often visited Dr. Taylor when rector here; whilst the memories of Lord Walton, his friend Cotton, Rousseau, Congreve, and Tom Moore are associated with this locality. The church was dedicated in 1241 by Hugh de Pateshull, Bishop of Coventry. It contains several monuments and tombs of the Cockayne, Bradburne, and Boothby families and J. Banks' statue of Penelope, only child of Sir Brooke Boothby, Bart., who died aged five years, in 1791. The tower, with its lofty spire, was restored in 1873; the chancel, by the late Sir G. Gilbert Scott, four years later. The Cockaynes were settled at Ashborne Hall from the twelfth to the seventeenth century, when Sir Aston Cockayne sold it to the Boothbys, who, in two days, were dispossessed by Prince Charles Edward, with the Marquess of Tullibardine and James Drummond, Duke of Perth, on his advance and retreat through Derbyshire. This part of the county will be rendered more accessible by a proposed line of the London and North-Western Railway to pass from Ashborne and Hartington to Cromford, near to Matlock, and so on to Boxton.

**OPENING OF A NEW LONDON PARK.**—Maryon Park, Charlton, was formally handed over to the London County Council on the 25th ult. by the donor, Sir M. Maryon Wilson, Bart., Lord of the Manor of Charlton. The ground covers an area of about thirteen acres, and is of an undulating character, its special features being a high, abrupt and rugged hill, called Cox's Mount, a precipitous cliff on the opposite side revealing 60 ft. of geological strata, and a small plain between suitable for cricket and other games.

**ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.** The following gentlemen having satisfied the examiners at the examination held in London on the 3rd and 4th ult., they have been granted certificates of competency by the Council of the Association:—Messrs. C. F. Ball (Croydon), W. Dyach (Aberdeen), F. J. Edge (Neath), W. Hall (Ealing), J. Manley (Chacewater), and F. Sumner (Kilburn).

The next examination will be held in London in April, 1891.

**HEATING FEED-WATER.**—There is something very remarkable in the alowness with which steam users recognise the great saving they may make in their weekly coal bill by the use of feed-water heaters. In many places the gain, which might be secured at no very great outlay, would make all the difference between a dividend and no dividend. At a meeting of a paper manufacturing company a short time since, it was mentioned that this one firm used 250 tons of coal per week, and that the recent increase in the price of coal made an increase of 2,600l. per year in the fuel bill, which made a reduction of 4 per cent. in the dividend, or from 12 to 8 per cent. This is only one of many works whereal such large quantities of fuel are consumed, and it is well known to engineers that it is the exception rather than the rule to heat the feed-water on its way to the boilers. Yet by this means some firms are now making a saving which represents a large income. A moderate estimate of the value of a heater which raises the feed-water from a normal temperature to about 200 degrees is the saving of 10 per cent. of the fuel used. This, where coal costs 1l. per ton, and where, as in the above case, 250 tons per week are used, represents a saving of 1,250l. per year; or probably a dividend of 50 per cent. to 60 per cent. per year on the capital expended on the feed-water heaters.—*Engineer.*

**IS THERE COAL BENEATH LONDON?**—Professor T. G. Bonney gave a lecture on the 25th ult., at the Working Men's College, Great Ormond-street, on the above subject. Professor Bonney said borings had been made at Dover, and at a depth of 1,220 ft. (100 ft. below where coal had been struck in Calais) a seam of good burning coal had been struck 3 ft. in thickness, which showed that the coal measures must pass under the Channel, and if the beds were trending in the same way as in approaching Calais, it was obvious that they should pass very nearly through London itself. The difficulty, however, was to trace them. In his opinion there was no chance of striking coal measures north of Croydon, though they might underlie the ground at no great distance from south of Croydon. But he was of opinion that coal was not to be obtained underneath London. Even if, in the future, collieries did spoil the scenery of Kent and Sussex, they were not likely to much increase by their smoke the thickness of our London fogs.

**IMPROVEMENTS IN NAPLES.**—According to a recent report of the Acting British Consul at Naples, the sanitary reorganisation of the old parts of the city was commenced in May last year, and the works have been carried on with great activity ever since. The "Società di Risanamento" have contracted to complete the whole work of demolition and reconstruction in ten years. In the new buildings, 35,881 square yards are to be devoted to habitations for the poorer classes, and 95,683 square yards are to be built over with habitations of an economical type, consisting of dwellings having one, two, and three rooms, with the necessary offices. All the works are to be carried out under the inspection of a Special Municipal Commission appointed by the Communal Council. The new embankment at Santa Lucia proceeds rapidly. The new part near the "Castello dell'Ovo" and the new dwelling-houses for fishermen and stores for boat gear and fishing apparatus have been completed.

#### LEGAL.

##### BUILDING BEYOND THE LINE OF FRONTAGE.

At the Lambeth Police-court on Monday, two summonses were heard against the City and South London Railway Company for building stations at the corner of New-street, Kennington-park-road, and Harleyford-road, beyond the line of frontage, and without consent in writing of the London County Council, contrary to the Statute 25 & 26 Vict., cap. 102, and 45 Vict., cap. 14.—Mr. William Graham appeared in support of the complainants, the London County Council, and Mr. R. C. Glen for the Company.—From the opening statement of Mr. Graham and the evidence of several witnesses, it appeared that the company's stations, one at the corner of New-street, Kennington-park-road, and the second at the corner of Harleyford-road, had been built upon the old forecourts of houses, and brought out right to the garden rail, and beyond the original and proper line of frontage. A good deal of evidence was gone into as to the size and style of the stations, and the necessity of having them built in the way complained of. The County Council considered the Company had built such stations without sanction, and contrary to the Building Act. The defence was that the Company had powers under their own Act of Parliament to do as they had.—Mr. Mullins, clerk to Mr. Bannister Fletcher, District Surveyor, was called, and he stated that in May, when the station at New-cross was in course of erection, communications had been sent to the Company, and a caution was given them that such building was beyond the proper line of frontage, and that they might be proceeded against. The further hearing of the case was adjourned.



## COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITION.

Nature of Work	By whom Advertised	Premium.	Designs to be delivered.
*Designs and Estimates for Church, Exmouth	The Committee	150, and 50.	Jan 1

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Public Road Improvements	Beckenham Local Bd.	G. B. Carlton	Nov. 3
*Private Street Improvements	do.	do.	do.
Refectory House and other Buildings	Belfast Corporation	Official	Nov. 4
Metalling, Sewering, Paving, &c.	Windsor Local Board	Edwd. Garlick	do.
Cast-iron Water Main (6 miles)	Fylde Waterworks Co.	Official	do.
Boiler Tubes, in use, &c.	India Office	do.	do.
*Supply of Cast-iron Works	Com. of Sewers	do.	do.
*Paving, &c. Works	Waltham Holy Cross Local Board	C. W. Wicks	do.
*Supply of Timber	G. W. R. Co.	Official	do.
*Roadmaking and Paving Works	Hammersmith Vestry	N. M. Nunn	Nov. 6
*Sewerage Works	Hackney Union	Official	do.
*Pipes, Sewers, &c.	Bethnal Green Vestry	F. W. Barrett	Nov. 6
*Paving Works	do.	G. Hodson	do.
*Waterworks	Quorn Local Board	V. Brent Craig	do.
Presbyterian Church, Newtown	do.	Official	do.
*Turkish Pump and other Works	Rea R. Workman	do.	do.
*Works at St. Francis, Duffell, and Cline	Windsor Corporation	do.	do.
Metalling, Sewering, Paving, &c.	Midland Ry. Co.	do.	do.
Re-construction of Avenue	Harfield Local Board	Joseph Shields	Nov. 11
Iron Rods, &c.	S. W. Evans Ry. Co.	A. P. J. Gutteridge	Nov. 11
*Making of Roads and Pavement	Willesden Local Board	G. Claude Robins	do.
*Paving Works	B. J. de Grey	do.	do.
*Erection of Houses and Alterations, &c.	The Admiralty	do.	do.
*Paving Works	Recreation Ground	do.	do.
*Oak Fencing, New South, &c.	Recreation Ground	do.	do.
*Cookery Room and other Works	Falham Vestry	W. A. Langmore	do.
*Roadmaking and Paving Works	do.	W. Sykes	Nov. 12
*New Walls and Windows, &c.	Woolwich Union	J. O. Cook	do.
*House-escape Stairs, &c.	do.	do.	do.
*Supply of Stores for 1891	Midland Ry. Co.	Official	do.

Those marked with an Asterisk (\*) are advertised in this Number. Competition, p. iv. Contracts, pp. iv., vi., and viii. Public Appointments, p. xvi.

## CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Sewerage Works	Barking Town Loc. Bd.	C. J. Dawson	Nov. 13
*Erection of Church, Epsom, Bournemouth	Rev. C. H. Russell	Official	do.
*Beach Weir	The Admiralty	do.	do.
*Roadmaking and Paving Works	U.K.S.A.	W. F. Ault	Nov. 1
Erection of 12 Infirmary at Asylum, Morpeth	do.	Mr. Crosswell	Nov. 1
*Sewerage Works, Poplar	London County Council	Official	Nov. 1
*Sewerage Works, Hammersmith	do.	do.	do.
*Works and Repairs to Sewers and Drains	do.	do.	do.
Alterations, Additions, &c. of Coffee Tavern	Paddington Vestry	do.	do.
*New S. Looke, Tarpaving and Roadmaking	Hase Co. Lums	J. B. Wilson and G. Mathews	Nov. 1
*Stable, Cartshed, &c. Drimley, Leeds	Barking School Board	C. J. Dawson	Nov. 13
*Erection of Sewer, &c.	York Corporation	J. Mansergh	Nov. 24
*Sewerage Works, &c.	War Department	Official	No date
*Fair Dwelling Houses, Hoxley, Leeds	Mr. Swallow	C. F. Burdett	do.
Laying down and Fixing Machinery, &c.	do.	do.	do.
Twenty-five Cottages	do.	do.	do.
Works at River Lul	Pelton Colliery, Chester	Official	do.
Works at Latheshead, Tye	Louth Corporation	Official	do.
Six Thin Houses, Hunslet, Leeds	Staple Pipe	do.	do.
House at Litheridge, East Crumlin	Mr. Heron	do.	do.

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Clerk of Works	Manchester Corp.	£2 5s. per week	Nov. 8
*Rate Collector	Lord Local Bd.	1000	do.
*Inspector of Sewerage Works	London County Council	2 1/2	Nov. 11
*Inspector of Municipal Works	do.	2 1/2	do.
*Surveyor of Works	New Malden Loc. Bd.	1000	Nov. 15
*Sanitary Inspector	County of Perth	300	Nov. 20

## A SPECIAL RECEIPT FORM CASE.

At the Walsall County Court recently, before Judge Griffith, the case of Broadbent v. Lewis came on for the fourth time.—Mr. Toller was for the plaintiff, and Mr. A. Young for the defendant.—The plaintiff, a builder's merchant in Leicester, claimed 392, 2s. 3d. (less 5 per cent.) for goods sold and delivered, and the defendant, a builder in Walsall, pleaded that the money had already been paid to a man named Lane, formerly the plaintiff's traveller, but since dead. The payment to Lane was not denied, but it was contended that it was an invalid payment, the defendant having disregarded a notice printed on all bills and invoices, that no receipt would be valid unless given upon a special printed form, and having accepted a written receipt upon the account. When the case was first heard a verdict was given for the defendant. Then on an application to the High Court to set aside that verdict, a new trial was ordered, and the case was subsequently before the Walsall County Court on two occasions, on each of which the jury disagreed.—Mr. Toller, in opening the case on this occasion, said the real point at issue was whether the defendant had exercised such reasonable care as ought to be exercised by an ordinary business man.—Mr. Young, for the defence, contended that express notice ought to have been given to the defendant that Lane was not authorised to receive money.—The jury were unable to agree.—Mr. Toller asked that the case might be sent for trial in another Court.—Mr. Young objected, but suggested a reference to arbitration, but Mr. Toller declined to consent.

## PROFESSIONAL FEES.

DURMAN AND GIBBS V. DENN AND SONS.

In the Westminster County Court, on Monday, this case came before Judge Bayley. The plaintiffs, a firm of architects and surveyors, sought to recover 35l. for professional services rendered to the defendants, builders, of 31, Brewer-street, W. Mr. Elliott appeared for the plaintiffs, and Mr. Beaumont Maurice for the defendants.—The plaintiffs' case was that the defendants had a lease of the above-named premises, which would shortly fall in, and, being desirous of renewing it, they applied to the Commissioners of Woods and Forests for a new lease, and then the plaintiffs were introduced to the defendants, and were instructed to draw plans and submit them to the Crown Surveyor, for which they said it was necessary to make an extensive survey, and for that they were to be paid 10l. and 5 per cent. on the estimated cost of the work for drawing the plans. If the work was not done the commission should be 2 1/2 per cent. The work was never carried out, and the defendants had paid nothing for it, hence the present action.—The defence was that the 10l. paid into Court was more than sufficient to pay for the work done. The plaintiffs represented that they had interest with the Crown Surveyors, and that the plans they drew were absolutely necessary, when they were not. The plaintiffs had agreed to do what was done for seven guineas.—His Honour held that the plaintiffs led the defendants to believe that extensive plans were necessary and that they had influence with the Crown Surveyor. He thought the amount paid into Court was sufficient, and gave judgment for the defendants, with costs.

## MEETINGS.

SATURDAY, NOVEMBER 1.

Association of Public Sanitary Inspectors.—Inaugural Address by the President, Dr. B. W. Richardson, F.R.S., entitled, "A Pioneer of Sanitary Science." 6 p.m.

MONDAY, NOVEMBER 3.

Royal Institute of British Architects.—Opening address of the Session by the President, Mr. Alfred Waterhouse, R.A. 8 p.m.

Society of Engineers.—Mr. Percy Griffith on "The Treatment and Utilisation of Exhaust Steam." 7.30 p.m.

Clerks of Works' Association (Carpenters' Hall).—Paper by Mr. T. Edmond. 8 p.m.

Royal Institution.—General monthly meeting. 5 p.m.

Liverpool Architectural Society.—Paper by Mr. J. H. Woodhouse entitled "A Few Recent Notes in Holland and Belgium." 7 p.m.

TUESDAY, NOVEMBER 4.

National Association for the Advancement of Art and its Application to Industry.—Annual Congress, Birmingham.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. E. J. Sykes on "General Powers and Duties of Inspectors of Nuisances." 8 p.m.

Society of Biblical Archaeology.—8 p.m.

Glasgow Architectural Association.—Mr. R. J. Gildard on "Greek Architecture: Late Period." 8 p.m.

WEDNESDAY, NOVEMBER 5.

National Association for the Advancement of Art and its Application to Industry.—Annual Congress, Birmingham (continued).

London Society for the Extension of University Teaching (Chelsea Centre).—Mr. Walter Leaf on "Heroic Fortresses and Architecture." 5.15 p.m.

THURSDAY, NOVEMBER 6.

National Association for the Advancement of Art and its Application to Industry.—Annual Congress, Birmingham (continued).

Royal Academy of Arts.—Professor A. H. Church, M.A., F.R.S., on "The Chemistry of Painting." Grounds. 4 p.m.

FRIDAY, NOVEMBER 7.

National Association for the Advancement of Art and its Application to Industry.—Annual Congress, Birmingham (continued).

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. E. J. Sykes on "Objects and Methods of Inspection." 8 p.m.

SATURDAY, NOVEMBER 8.

National Association for the Advancement of Art and its Application to Industry.—Annual Congress, Birmingham (concluded).

## RECENT PATENTS:

## ABSTRACTS OF SPECIFICATIONS.

16,380.—DOOR CLOSERS: E. C. Urry and another.—This invention consists of a door acting with a shoe, like many other patterns, but with a special arrangement of arms and levers acted upon by springs and guided by friction-rollers, which, while lessening the friction, give ease and efficiency in work.

17,758.—NEW BUILDING MATERIAL: H. A. Bassett.—This patent is for a new composition for use in the manufacture of building materials, serving to produce the binding and hardening of the substances forming the bulk of the material. The composition is made with glue, oil, and water, and is then mixed with

plaster and borax, to be used as wished, for ceilings, walls, or enrichments, or for artificial stone.

17,792.—VENTILATING DRAINS: A. Young.—According to this invention, two bell-shaped receivers or chambers are used, and these chambers are heated by gas and by coils and with asbestos packing. The sewerage passing up is drawn through these chambers and burnt, the smoke escaping by the outlet provided—say, the ordinary street-lamp.

8,402.—WATER-CLOSET FITTINGS: R. Frame and A. C. 207.—This invention relates to the construction of water-closets, &c., holding water at a fixed level, the permanent overflow point to be discharged on additional water entering the bowl by siphonic action, and consists of a new and improved device for this and also a device for reducing the noise made in such closets by the breaking of the siphon when it takes air at the mouth of the receiving limb when the closet is discharged of its contents.

11,444.—STAIRS: W. Thompson.—Metallic sections, according to this patent, are adapted to be combined to build up a complete spiral stairway and to form, if desired, a double spiral stairway from a common centre. The rise and tread have an eye or socket and groove which fits them together round a common centre.

12,398.—DETECTING LEAKAGES IN SOIL-PIPES: R. T. Crane.—This invention has for its object a means for detecting leaks in soil-pipes. A detective fluid with pungent scent is introduced in a phial through a perfectly sealed receptacle and then broken in the pipe so that wherever the colour is detected a leak is certain and there is no uncertainty from the odour hanging about without coming through the pipe.

## NEW APPLICATIONS FOR LETTERS PATENT.

October 13.—16,231, P. Cream, Kiln for Burning Bricks, &c.—16,232, J. Stones and G. Gutter, Gutter and Ridge for Ridge and Furrow Roofs.—16,234, T. Edwards, Use of Concrete, Cement, Artificial Stone, &c., for Building of Houses.

October 14.—16,230, T. Pollard, Chimney Pots or Flues.—16,205, A. Ross, Water Cisterns.—16,328, H. Green, Spirit Levels.

October 15.—16,372, S. Meggitt, Automatic Window Fastener.—16,373, J. Little, Prevention of Steam or Moisture on Windows, Walls, &c.—16,394, F. Ham and R. Preston, Siphon Cisterns.

October 16.—16,473, E. Blount, Door Checks.—16,479, J. Jones, Cows or Ventilators.—16,485, S. Bouchier, Window Sash-fasteners.

October 17.—16,610, J. Wood, Preventing the Escape of Smoke from Chimneys.—16,654, S. Bouchier, Window Sash-fastener.—16,601, A. Middle, Sash-fasteners.—16,609, W. Horn, Mitre Cutting Machine.—16,622, W. Drayson and T. Bright, Basins for Lavatories, Urinals, &c.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

9,321, Don Pastor de la Sala, Joinery.—14,162, J. Bott, Circular Saws.—14,181, J. Sears, Ventilators.—14,328, E. Bouchier, Refractory and Non-Conducting Bricks, &c.—14,766, R. Haddon, Windows and Window Fasteners.—14,823, J. Sears, Ventilators.—15,393, W. Wall, Combined Door Bolt and Indicator.—15,828, E. Thomson, Ascertaining immediately whether exit doors or entrances of theatres and other buildings are unfastened or not.—15,441, W. Kimberley, Combined Plane and Old Stone.—15,622, R. Parker and A. Barker, Cows.—15,654, C. Cox and J. Robinson, Switches for Walls or Ceilings for Electric Light.—15,782, J. and A. Chiversall, Polishing and Enamelling Imitation Stones, &c.

## COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

16,301, S. Hill, Door-closing Springs and Checks.—20,207, E. Painter, Raising and Lowering Windows.—20,406, H. Lake, Apparatus for Cutting Veneer.—1,908, E. Wilford, Screw Fastening for Windows.—3,353, W. Chinnery, Chimney Tops for Smoky Chimneys.—12,837, J. Costello, Sewer Traps.—14,427, K. McKenzie and G. Anderson, Chimney Tops.



## ESTATE EXCHANGE REPORT.

## ESTATE EXCHANGE REPORT.

[illegible]

CARDIFF.—For additions and alterations to Canton Police station, Cardiff, for the Cardiff Corporation. Mr. Wm. Harpur.

TIMBER.	£.	s.	d.	£.	s.	d.
1000	10	0	0	10	0	0
2000	20	0	0	20	0	0
3000	30	0	0	30	0	0
4000	40	0	0	40	0	0
5000	50	0	0	50	0	0
6000	60	0	0	60	0	0
7000	70	0	0	70	0	0
8000	80	0	0	80	0	0
9000	90	0	0	90	0	0
10000	100	0	0	100	0	0

METALS.

OLLS

## TENDERS

CARDIFF.—For additions and alterations to Canton Police-station, Cardiff, for the Cardiff Corporation. Mr. Wm. Harpur, 1st C.E., Borough Engineer, Cardiff:—  
F. Griffiths ..... £510 | Hy. Davies, Cardiff (accepted) £423

LONDON.—For marble mosaic paving of vestibule and hall Mount-street Chambers, W. Mr. A. J. Bolton, architect.



LONDON.—For the erection of a Citadel at South Tottenham, N., for General Booth. Quantities not supplied. Mr. W. Gilbee Scott, architect.  
 Percival Hart..... £2,100 0  
 E. Jarvis..... 1,800 0  
 H. Knight & Son..... 1,800 0

LONDON.—For alterations at the Grosvenor Gallery, E. 8th street, W., for Sir Coutts Lindsay, Bart. Mr. J. W. J. 1890, C.E., architect.  
 Bywater..... £2,218 10  
 Patman & Petheringham..... 2,736 0  
 Styles & Son..... 2,684 0  
 Lapworth Bros. & Harrison..... 2,588 0

LONDON.—For the construction of sewers (section 2) at E. 4th Ham, E., for the Local Board. Mr. W. H. Savage, Surveyor to the Board, Local Board Office, East Ham, E.  
 B. Cooke & Co..... £4,180 0  
 John Jackson, Broadway, E. 4th Ham, E..... 1,800 0

LONDON.—For the design of a villa residence, Crayke-road, Mr. H. A. Lewis, architect.  
 Davis Bros..... £2,400 0  
 J. H. Jones..... 1,500 0

LONDON.—For redecoration, &c., at 44, Hyde-park-square, for Mr. A. Black, Mr. A. Lett, architect.  
 W. D. Palmer, Henshall (accepted)..... £2,000 0

NEWCASTLE.—For building new Industrial Schools, Newcastle-on-Tyne, for the Committee. Messrs. Plummer & Burrell, architects.  
 W. H. B. 1890..... £1,000 0  
 J. H. B. 1890..... 1,000 0

NEWCASTLE.—For building a new school, W. 1890, C.E., architect.  
 J. H. B. 1890..... £2,000 0  
 J. H. B. 1890..... 1,000 0

RYE.—For the erection of a new school, Rye, for the Rye School Board. Mr. H. A. Lewis, architect.  
 J. H. B. 1890..... £1,000 0  
 J. H. B. 1890..... 1,000 0

STAFFORD.—For the erection of a new school, Stafford, for Messrs. J. F. & H. 1890, C.E., architect.  
 J. H. B. 1890..... £1,000 0  
 J. H. B. 1890..... 1,000 0

SOUTH MINNIS (near Barnet).—For erecting houses at South Minnis. Mr. Arthur S. Frimrose, architect and surveyor.  
 J. H. B. 1890..... £1,000 0  
 J. H. B. 1890..... 1,000 0

STREATHAM.—For the erection of a new school, Streatham, for Mr. J. L. Stanley. Mr. E. B. 1890, C.E., architect.  
 W. D. Palmer, Henshall (accepted)..... £1,000 0

TUAM.—For the erection of a new school, Tuam, for the Tuam Board. Mr. C. W. 1890, C.E., architect.  
 J. H. B. 1890..... £1,000 0  
 J. H. B. 1890..... 1,000 0

For the erection of a new school, Streatham, for Mr. J. L. Stanley. Mr. E. B. 1890, C.E., architect.  
 W. D. Palmer, Henshall (accepted)..... £1,000 0

Attention to the "London Press" Publichouse.—We are asked to state that the amount of the tender for the above work, which appeared in our issue of 19th Oct., should have been £250, not £200. The mistake was not ours.

SUBSCRIBERS IN LONDON and the SUBURBS, by prepaying at the Publishing Office, 15s. per annum (or 4s. 9d. per quarter), can ensure receiving "The Builder" by Friday Morning's post.

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#### TO CORRESPONDENTS.

A. W. & Co.—W. G. F. & C. (thanks, but hardly suitable. Please send address.)—J. L. (shall have attention)—P. E. P.

All statements of facts, lists of tenders, &c. must be accompanied by the names and addresses of the sender, not necessarily for publication. We are compelled to decline publishing cut books and giving addresses. Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

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Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY, but those intended for the front Page should be in by TWELVE noon on WEDNESDAY.

SPECIAL ADVERTISEMENTS IN STANDING ADVERTISEMENTS OR ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY morning.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

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 READING CASES, 1/9 NINEPENCE EACH.  
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25, 26, 27, BERNERS STREET, W., MANUFACTURERS AND CONTRACTORS

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BOX GROUND. COMBE DOWN.

WESTWOOD GROUND. STROKE GROUND.

THE BATH STONE FIRMS, Limited.

HEAD OFFICES: BATH.

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The stone from these quarries is known as the "Wash Beds," and is of a crystalline nature, and of a durability for the most durable stones in England.

Is of the same crystalline nature as the Cheltenham Stone, but finer in texture, and more suitable for fine moulded work.

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The New "Dresden Bank," Berlin.—Herr L. Heim, Architect	Double-Page Photo-Gravure.
Competition Design for Completion of Holy Trinity Church, Cork.—Mr. Thomas Drew, R.H.A., Architect	Double-Page Photo-Litho.
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North Transept, Norwich Cathedral.—From a Drawing by Mr. A. D. Smith	Single-Page Ink-Photo.
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### A Few Norman Stones.

**T**WELVE years ago, *i.e.*, on Feb. 15, 1878, a circular was issued from Versailles by the Minister of Public Works to the members of a Committee (which was then appointed) to examine and report on the various kinds of stone in use or capable of being used on the roads in France. This Committee, composed of eight officers of superior rank in the department of the "Ponts et Chaussées," under the presidency of M. Graeff, an Inspector-General in that department, presented their report in 1880; and, as no great change in the relative value or condition of the varieties of stone then reported on can have occurred in the comparatively short period of ten years, we believe that a brief glance at that exhaustive compilation will be an appropriate preface to the further consideration of such varieties as might possibly be utilised with advantage in this country. The engineers employed on the roads of the different departments and arrondissements were directed to send samples to the Committee, with reports of their relative value, prepared on such a basis that uniformity was ensured in the computation of those values. The total number of samples so received amounted to no less than 2,414, but as this number appeared to be in excess of that which was really necessary, the Committee decided to select seven or eight varieties from each department, and they actually tested 637 samples, representing seventy varieties of stone.

We have prepared from the elaborate tables appended to that report, a list of the most important varieties, arranged according to their ascertained value for work, irrespective of price, into which we need not at present enter. Besides those now tabulated, there were a great many rounded gravels and pebbles brought under test, but the results recorded by the Deval machine ought not in fairness to have been brought into computation, as the loss by weight was, in consequence of the previous removal of all angles, naturally very slight in such stones.

The experiments carried out by this Committee were conducted with such scrupulous care that it forms the most valuable record possible to obtain of the actual value of such

stones. The table below gives the averages and the aggregate of those averages for many samples; but, of course, in most classes a very great variation occurred between those which gave the best results and those which gave the worst. It will, however, be noticed that though flints and millstones head the list in column 5 (resistance to crushing), they only occupy the seventh and eighth places in order of merit, and that those stones which are reported as the best by the engineers who have used them, are also first in the order of merit in the combined laboratory tests. Quartz, porphyry, eurite, and the basalts, have all practically the same value, and are well behind quartzite. Grès, which is a variety of quartzite, closely follows basalt, and the granites are only better than the limestones. It may be mentioned also that the ninety-one different samples of pebbles and gravels which were tested only averaged 9.6 in column 6 (reports of the road engineers).

TABLE A.

1	2	3	4	5	6	7
Order of Merit.	Class of Stone.	Average number of cubic feet tested.	Condition of work by pressure of 100 lbs. per sq. inch, but not less than 100 lbs. per sq. inch.	Condition of work by pressure of 100 lbs. per sq. inch, but not less than 100 lbs. per sq. inch.	Condition of work by pressure of 100 lbs. per sq. inch, but not less than 100 lbs. per sq. inch.	Aggregate Value.
1	Quartzites.	25	16.6	14.2	14.0	44.8
2	Quartz.	53	14.3	14.3	14.2	42.8
3	Porphyries.	29	16.0	12.8	13.9	42.7
4	Eurite.	9	16.0	13.4	13.0	42.4
5	Basalts, Traps, and Diorites.	41	15.0	12.8	14.3	42.1
6	Grès (metamorphic sand-stone).	43	15.4	13.2	12.5	41.2
7	Flints.	77	11.1	16.6	11.3	39.0
8	Millstones.	19	11.1	15.2	11.1	37.4
9	Schists.	13	13.4	12.2	11.6	37.2
10	Gneiss.	14	14.3	12.0	10.2	36.5
11	Granites and Syenites.	55	13.6	10.2	10.5	34.3
12	Limestones.	137	10.2	9.9	8.0	28.1

When the Report which we have had under our consideration was prepared, an additional method for testing relative value had not then been brought into use. This method is by means of a machine invented by a M. Dorry, and has already been briefly alluded to in our columns in connexion with the Paris Exhibition last year.\* It is a frictional

machine, and has further demonstrated (as indicated in the table below) the superiority of resistance to constant wear of quartzites over any other kind of stone on which experiments have recently been conducted.

TABLE B.

Results of Tests of different Road Materials made at the Laboratory of the Ponts et Chaussées, in Paris, in 1880, with the "Dorry" Machine.

N.B.—The annexed numbers give in decimals of an inch the thickness of stone removed by friction from the lower side of a prism loaded with a constant pressure of 511 lbs. on the square foot, the grinder (64.5 in. circumference) revolving 4,000 turns at a speed of 2½ miles per hour:—

1. Quartzite of Cherbourg (Manche)	11
2. Quartzite of Domfront (Orne)	15
3. Quartzite of Vitré (Mayenne)	16
4. Quartzite of Croixille, near Harcourt (Calvados)	18
5. Grès de St. Sauveur le Vicomte (Manche)	21
6. Grès d'Erquy (Cotes du Nord)	22
7. Grès d'Épernon (Eure et Loire)	24
8. Porphyry of Lessines (Belgium)	24
9. Granite from Norway	24
10. Grès de St. Cheron (Seine et Oise)	24
11. Porphyritic granite of Clefay (Vosges)	25
12. Granite of Saos (Mayenne)	26
13. Porphyry of Quenast (Belgium)	27
14. Granite of Flamanville (Manche)	27
15. Granite of Iles Chaussey	29
16. Granite of Arkoze	29
17. Granite of St. Brieu (Cotes du Nord)	30
18. Granite of Rostellée (Finistère)	33
19. Granite of Breil (Finistère)	39

And many others with greater loss by friction. It will be noticed that the relative aggregate wear of the different varieties of stone here given is approximately as follows:—

Quartzite	1
Grès	1½
Porphyry	1½
Granite	2

That is to say, granite would wear out twice as fast as quartzite, an approximation to the results arrived at by the preceding tests.

If we examine the geological maps of the north-west of France, it will at once be seen that the volcanic and metamorphic rocks are almost entirely absent from Picardy and the eastern portion of Normandy, and it is consequently the case that, though in the interior of those provinces local stone has to "be made the best of," large quantities are imported from many parts; for instance, the porphyry of Lessines and Quenast finds its way to Arras from Belgium, and the quartzite of Cherbourg is used to a great extent in the towns along the coast, such as Havre, Dieppe, Boulogne, and Calais. Starting from the north-west corner of the horn of the Depart-

\* The Builder, June 15, 1889, p. 440.



ment of Manche, viz., Cape de la Hague, great beds of metamorphic rocks stretch down in a south-easterly direction through Manche, Calvados, and Orne, having their northern limit a little to the south of Caen, and their southern down in Brittany and the northern portion of Touraine. Through this vast mass of excellent road material, granite and other volcanic rocks of many kinds protrude here and there as usual, and Normandy is rich indeed in the stones it possesses.

In the hilly district inland from Avranches, a capital white quartzite is found in the hill-side above the very picturesque town of Mortain; it is used generally throughout that district, but the price at Granville (the nearest port)—viz., 8s. 8d. per ton for 2½ in. stone—is too high to enable it to be available for export in competition with other places, as, however good a stone may be, it is generally useless for export unless it lies near a good port. Proceeding round to Cherbourg, we find the two requisites,—the port and the stone,—close together; for, immediately at the back of the town lies the so-called mountain of Roule, the top of which is about 400 ft. above sea-level. The northern portion of this hill, which faces the harbour, is a solid mass of quartzite, in beds of from 2 ft. to 7 ft. in thickness, which have, as a rule, no intervening strata of rubbish or inferior rock. The dip to the north and north-east varies from about 50° at the west end of the hill (which is precipitous and cut off by the little stream of the Divette), to vertical in the centre, with a reverse slope to the south towards its east end. Starting from the west end, which is nearest to the docks, the first quarries are those which belong to the Department of Marine, from which, together with others, the great Digue, or breakwater, has been constructed. No machines are employed in either of these quarries, and but few men; but the quality of the stone is very good. Next to these is the quarry of the *Société Anonyme Française*, which is one of greater importance. M. Menut, who is the manager of this Company, employs a considerable number of workmen, and has recently erected a crushing mill of some size, supplied by a French firm of engineers. There is no apparent difference in the quality of the material here from that in the above-mentioned quarries.

Proceeding eastward we arrive at the extensive quarries of MM. Fonty et Cie, who employ about 300 workmen, 150 of whom break stone by hand, the remainder being employed in quarrying and dressing setts, and at the crushing-mills, of which they possess two. The first, which was provided about a year and a-half ago by Mason, of Leicester, is of the usual type, having a riddle 12 ft. long and 3 ft. 6 in. in diameter, divided into three sections, pierced with 1, 2, and 2½ in. holes respectively. It is set at an angle of about 20 deg. to the horizontal. The 45-horse power engine which works it also works a grinding-mill and a small, very fine riddle, set up expressly for producing the sand of crushed quartzite, which is used almost, if not quite, exclusively now at the Government and other laboratories in Paris and in the cement factories in France for testing the quality of cement. The variety of processes through which the stone passes before it is converted into sand, passing the requisite tests of the Government, runs up its cost to a somewhat high figure, viz., 8s. per ton. But this is not a matter of any great significance, for the quantity required is never very great; it, however, furnishes us with an admirable example of the extreme care taken by the French Government to obtain the most reliable data from the tests to which they subject materials. They recognise that the results obtained by an admixture of cement with sands of various textures, and whose grains are of various forms, are unreliable. For instance, sand with, in the one case, sharp-angled grains, and, in the other case, round grains (such as sea-sand), would produce the same difference in tests for strength as those in concrete in which broken stone and round pebbles had been severally used.

The other crushing mill, which has been in use for about four months, has been supplied by Marsden, of Leeds, and is in many respects so different to those in general use that it will be instructive to give a more detailed account of it. The rough blocks of stone (from the size of a man's foot to that of his head, or a little larger) are shovelled or thrown at required intervals from the railway trolleys (mètre gauge), each of which holds about five cubic yards, into the hopper connected with the crushing jaws, from which the broken stone is carried by a shoot into buckets attached to an endless chain; this is set at an angle of about 60 deg., and empties the contents of the buckets into a hopper, which feeds the lowest of two riddles. This riddle is set horizontally, and with a diameter of 3 ft. 6 in. at the end next the hopper, increasing to 6 ft. at the outlet, is consequently in the form of a truncated cone. Its length is 12 ft., which is divided into four sections, pierced with circular holes 1½, 2, 2½, and 1½ in. respectively, the smallest holes being next the feeding hopper. This riddle revolves, and the larger stones gradually work towards the other end, passing in their progress onwards with the smaller particles. That which remains falls into a shoot, which feeds another series of buckets on an endless chain, set at an angle of 50 deg. by means of which the bulk of the stone, now partly screened, is raised to an upper level and discharged into a hopper which feeds a second riddle. The spindle of this upper riddle lies about 6 ft. above, and the same lateral distance from the spindle of the lower riddle. This is also set horizontally, and is also in the shape of a truncated cone, being 3 ft. 6 in. in diameter at the inlet, and 5 ft. diameter at the outlet. It is 10 ft. 6 in. in length, divided into three sections pierced with holes of 1½, 1½, and 2 in. respectively. All stone which fails to pass through the holes in the last section passes out at the end to a shoot, which sends it back automatically to the crushing jaws. Beneath each section of each riddle is a container, from which the trucks below can be filled by means of sliding trap-doors, capable of being opened and closed by cranked arms. Consequently, two lines of narrow gauge (half mètre) rail can be placed under the mill, carrying trucks, each of which contain half a cube metre of broken stone, and the various sizes of metal and material for concrete are readily sorted and run to heap. The arrangements of this very compact mill, which is worked by a 35 h.p. engine, are stated to have been designed by M. Fonty (one of the members and Managing Director of the Société) and are undoubtedly most complete and creditable.

With these first-class machines, a very small proportion of flaky stone and a very large proportion of well cubed stone is produced; so much so, that the difference between this and hand-broken metal is, even to a well-practised eye, scarcely apparent, and, practically, the value of each for road work is the same.

Taking one week with another, the 150 hand-breakers, from one cause or another, do not turn out more than about 700 tons of metal, whilst the two mills will produce more than double that quantity per week.

The quarries are, as usual, sub-let to gangs of from six to twenty men each, who find their own tools, or they can be supplied and kept in order for them by the Société at fair prices. They also find their own blasting-powder, which (as is usual in similar quarries elsewhere) is preferred to any other nitrogenous compound, and the quarrymen and stone-dressers are paid solely for the setts they produce, the whole of the remainder of the quarried stone, which is afterwards broken up generally into road metal, being the property of the lessees of the quarry, and supplied free of cost to the hand-breakers and to the mills. The cliffs or exposed faces of these quarries are in some cases of considerable height, even up to about 200 ft., and, as is frequently the case elsewhere, the heart stone is distinctly better than that near the surface. A small proportion of the stone is

of a very light grey colour—almost white. This is comparatively easy to work, both for setts and for metal, and can be supplied at slightly lower price than the pale blue-grey which is the most durable, and the characteristic stone of Cherbourg. There is also a little slightly tinged with iron, which is probably as durable, but not, of course, so desirable where colour is deemed important. The durability of this stone is well exemplified by the fact that at the approaches to the dock bridge at Cherbourg, where the traffic is very considerable, the wear on the quartzite setts is much less than that on some granite racer blocks which have been once renewed, the two being laid side by side with each other.

It is usual in France to pave with setts of a much greater width than those which are commonly used for English streets, and it is believed by the Cherbourg stone-cutters that narrow setts could not be made from their stone without an enormous waste of material. That might be so, but it could be tried. They, however, maintain that there is no real advantage to be gained by the narrow setts which only make more joints, and add as much to the cost of the paving, considering that the security of foothold does not, on should not, depend particularly on the joints in the pavement, but in the irregularities on the surface of the stone, a view supported (as far as that point is in question) by Mr. Dunscombe, the late eminent engineer to the Corporation of Liverpool and the County Council of London. But the bevelling of the sides of these large setts seems unnecessary and erroneous in every way. The size of metal-ling most frequently demanded is about 2 in., and a large trade is being done with the coast-ports of France, and (more recently) with some few places in England, viz., Southampton, Sheerness, Erith, &c. It appears to be an excellent material and deserving of confidence, more especially as it can be supplied to any places where good durable stone is scarce at very moderate prices, i.e., from 10s. to 11s. a ton for 2 in. metal. It would probably pay the proprietors well to make a railway to the dock in place of transporting it in the unwieldy carts which are invariably used in that part of France, and are sometimes loaded up with as much as six tons of stone, the usual allowance of horses being one per ton of stone. This gives a gross weight of nearly three-quarters of a ton per inch of tire, which necessitates stout roads.

The laboratory reports on this quartzite of Cherbourg are very satisfactory, and are as follows, computed on the same principles as in Table A:—

Co-efficient for resistance to crushing			20.4
Do.	do.	to shock	21.7
Do.	do.	for actual wear on roads	18.5
Total			59.4

which is far beyond the average of 44.8, the highest on the list in Table A.

The chemical analysis of the sand is also very remarkable, giving 99.45 of silica, which does not leave much room for anything else.

The next, and last, place which we need consider in connexion with this branch of the subject is Caen. About eight miles south of that town lie the celebrated quarries of grès stone near the village of May. Those close to the village and running from it down a huge artificially-cloven gully to the bank of the river Orne are M. Caval's, and those lying to the north of M. Caval's and running in two lines parallel to the above-mentioned gully are M. Barrier's, a gentleman who also owns the quarries of white grès at Perrières (between Mezidon and Falaise), a stone which is used for similar purposes to those at May, and is, in the opinion of some of the engineers, even its superior in quality. This grès is a very compact metamorphic rock of moderately fine grains of sand solidified by a cement of extraordinary tenacity. As has been frequently remarked, it is very difficult to determine the distinction between grès and quartzite; nevertheless, the stone of May and the stone of Cherbourg are in appearance very dissimilar, the latter being a



pale bluish-grey, and the former varying from a deep copper colour to a buff-grey, and is not infrequently grey, mottled with copper. The power of this stone to resist abrasion has already been noted in our columns in connexion with an article on "The Paying-stones in the Paris Exhibition," and it is very extensively used throughout all that part of Normandy. The strike is W.N.W. and E.S.E., and the dip about 45 deg. to the north. In these quarries a good deal of poor rock (especially in the quarries of M. Barrier) intervenes between the main strata, which vary very much in thickness, some being very thin and in much demand for flagging and foot-path work generally.

There are also quarries of grès on the west side of the river Orne, opposite to those at May, and nearer to the station of Fougueroles. These are little more than superficial scratchings, but many thousand tons of broken metal are piled in little heaps all over a large area, which belongs to a M. Thomasse, who, for some reason or other, has allowed most of it to remain there for a considerable period. It does not appear to be quite the equal in quality to that on the opposite side of the river. The setts and squares from May find their way to Paris and many other towns. There does not appear to be any difference in quality between the copper-coloured grès and that of other colours: and, though some may fancy that the red is the best, no difference is apparent in the wear of the little squares which pave most of the footpaths in that part of France, whatever their colour may be; but the more crystallised outwears the duller portion of the rock.

The prices of this stone, free on board at Caen, are as follows:—

Setts, from 11s. 6d. to 18s. 6d. per ton, covering from 2½ to 2¾ yards super. They are from 6 to 7 in. in depth, and are 5 to 6½ in. by 7 in. in area.

Squares, from 22s. to 36s. per ton, covering from 7½ to 10½ yards super. They are from 1½ to 3 in. in depth, and from 5 in. by 5 in. to 6½ in. by 6½ in. in area.

2 to 2½ in. stone broken, 5s. 6d. per ton. Unbroken stone in blocks, 4s. per ton.

The stone from May is transported chiefly by cart, if intended for export, and put straight on board at Caen, which saves the double shift into the railway-trucks at Fougueroles, and out again at Caen Station, notwithstanding the proximity of the former station to the quarries. The canalisation of this part of the Orne would not be an expensive or a difficult matter, and would considerably reduce the cost of transport of this stone. Below Caen the river is tidal.

Through many miles of this red grès the line of railway passes on its way from Caen to Fiers, and as the river Orne winds through it, leaving steep wood-clad bluffs of some 200 ft. in height, first on one bank and then on the other, we become aware that beautiful scenery is obtainable in Normandy, of a character not dissimilar to that of the finest parts of Derbyshire, and therein lie the homes of the road stones.

#### NOTES.

**T**HE Art Congress at Birmingham has been in one sense more successful than either of the previous ones, owing to the alteration in the grouping of the meetings, by which in the mornings there has been a collection of all the members at one meeting only, and in the afternoons there have only been two meetings in progress simultaneously, the subjects connected with various sections being more or less grouped together. This is a much better arrangement for promoting the interest and spirit of the meetings than dividing the proceedings up into five sections meeting simultaneously in five different rooms, which leads to the splitting up of the audiences into a number of small groups, or the entire desertion of one or two sections in favour of one particular one which happens to be popular. This led to some of the best and most

useful papers at both the two previous Congresses being read to audiences of half-a-dozen people. The new arrangement is certainly advantageous to the cause of Architecture, which is always the unpopular section with the majority of the subscribers, as the subject they know least about. Under the new arrangement they can be got together into one room by something they care about, and can then be caught and taught about architecture. There was a fair attendance at the Wednesday morning meeting, which was a specially architectural one, when Mr. T. G. Jackson read his address as President of the Architectural Section, which was an admirable and very moderately-worded protest in favour of the purely artistic view of the architect's function, as that of an artist, and not a surveyor. A short and very spirited paper by Mr. R. T. Blomfield, which was evidently much enjoyed by the audience, followed very aptly as a protest in the same direction, but in a lighter and less serious vein. In next week's issue, when the whole of the papers will have been read and can be considered and compared, we may be able to give something like a summary and critical estimate of the general results of the teachings of the third Art Congress.

**A**S will be seen by our report of the meeting of the London County Council, that body, after about four hours' further discussion, on Tuesday last adopted by a large majority the extensive scheme, propounded and recommended by the Housing of the Working Classes Committee, for the clearing away of a large slum in Bethnal Green. The proposals of the Committee were fully detailed in their report, presented to the Council last week, and printed by us nearly *in extenso* at the time. The opponents of the scheme did not deny the wretched and insanitary condition of the hovels which cover the fifteen acres of area in question; they merely differed from the majority as to the best means of procedure, and they very rightly urged that it would be desirable to proceed with great caution in the promotion of such schemes if they did not wish to put a premium on "the cultivation of slums for the improvement market." They also urged, and with much justice, that the local authorities should be far more sharply kept to their obligations, in such matters as paving and scavenging, than they have been hitherto. From a personal inspection of the area in question made on Wednesday last, we must testify to the apparently utter absence of scavenging, the streets being strewn with garbage of all kinds. The paving, in places, notably in front of the house No. 1 Sherwood-place, at the corner of Christopher-street, is in a disgracefully broken and dangerous condition, full of holes admitting of the passage of surface water, more or less foul, to the sub-soil of the houses. Some of the houses on the area scheduled are very dilapidated and old. In the side of the house at the corner of Mount-street and Church-street is an ornamental tablet with a rose in the centre, and inscribed "Rose-street, 1725." We trust that in carrying out the scheme care will be taken to avoid wholesale evictions, which can only lead to overcrowding in other parts of the neighbourhood. There are on the area scheduled several vacant sites, or sites only cumbered by condemned houses, which might be made available for the commencement of the work of erecting new and sanitary dwellings to receive the inmates of the adjoining hovels.

**T**HE country fire season has now commenced. A serious fire, for example, occurred not long ago at Sir George Dasent's house at Ascot. Of course, the first thing is for occupiers to do their utmost to prevent fires by seeing that the structure of the building is in proper condition, and that due care is taken with lamps and candles. But it is a matter of doubt whether, generally speaking, England is not behindhand in regard to appliances for extinguishing fires. It has

been stated more than once, on good authority, that the London Fire Brigade is undermanned, but in many provincial districts there can scarcely be said to be proper appliances for putting out fires at all. In some instances there is a Volunteer Fire Brigade, with an engine which is often very weak, or not in good order. The Towns Police Clauses Act, 1847, is incorporated with the Public Health Act, and contains a clause giving power to Commissioners to obtain proper appliances. But what seems to be required is some general system. There should be fire brigades in every town of a strength in proportion to the size and population of the town, and in the country there should be engines and escapes at certain defined centres, and the cost should be defrayed from the rates. Until this is done property can never be as safe from injury by fire as it might be, and the rates of insurance for buildings cannot be safely lowered.

**W**E have received from Messrs. Flockton & Gibbs, of Sheffield, the specification of the patent which they have taken out for their improved plan for the arrangement of public buildings, as illustrated in their plans sent in competition for the Sheffield Municipal Buildings. The complete specification lays down the main point thus—

"The plan for which we claim novelty is the placing of the rooms of each department in a separate wing or compartment of the building, arranging the rooms within it as if each wing or compartment were a separate building with entrance for the public to each department through or by an inquiry or general office, and with no other entrance for the public to the private offices; and combining the several departments into one building by grouping the wings or compartments around a central public hall or passage, through which alone the public can gain admittance to the inquiry or general offices of the several departments."

This is a clear and definite statement of what is claimed by the patentees as an invention for protection, and it will no doubt be a matter of considerable interest for the architectural profession to have the question, whether there can be a patent-right in a special plan of building, discussed and definitely settled. Messrs. Flockton & Gibbs ask us to draw attention to the fact that notice of opposition to the patent can be given within two months after the date of advertisement (October 29), "on the grounds stated in section 11 of the Patents Act of 1883. The subsequent procedure is set forth in sections 12 and 13 of the same Act, and in Nos. 34 to 44 of the Rules under the Act."

**I**T is satisfactory to learn that the principle of arbitration has been upheld by the decision of the Board of Conciliation which took the Tyneside shipbuilders' dispute in hand. It will be recollected that this Board was formed on the recommendation of the Mayor of Newcastle, and was composed of representatives of the various crafts connected with shipbuilding, with full power to settle the dispute. They considered,—as, indeed, did all parties except the disaffected joiners,—that all those concerned were bound to comply with their written agreement to adhere to Mr. Burt's award; and the strikers were accordingly ordered to resume work this week. Certain minor points connected with the apportionment of work between the carpenters and joiners have yet to be decided upon. Disputes arising from "division of labour" have been rather numerous of late, especially in the shipbuilding trades, though few, fortunately, have resulted, as this affair has done, in a strike extending over a period of three months. For instance, there exists at the present time a considerable amount of dissatisfaction amongst the ships' plumbers, &c., arising from similar causes, which also threatens a cessation of work. These are matters which the men take very largely into their own hands, and whatever the merits of the case may be, and whichever section of the men is really aggrieved, the employer is bound to suffer in the event of a strike,—although he may be on the best of terms with



each department concerned. Nor is it to be charged against him that it was in his province to have apportioned the work satisfactorily at the outset, and thus have left no room for complaint. For gradual but revolutionary changes in the style and build of vessels, and in the methods of constructing them, has by degrees effected a disarrangement of the original apportionment of the labour. This, at least, appears to be one of the principal features of this very irritating, among the many causes of strikes,—and one with which Conciliation Boards would seem to be best able to deal.

**A**N apparently inspired article in a recent issue of the *Times* again refers, and at some length, to the so-called Grand Junction Railway—that is, to the amalgamation of the Manchester, Sheffield, and Lincolnshire Railway Company with the Metropolitan Railway. Some kind of scheme for joining these two lines appears to be in the air, but as two blacks do not make a white, so two poor companies joined together do not make one rich and flourishing company. It was stated in the article to which we allude that a terminal station will be constructed near Lord's Cricket Ground for the purposes of the distant traffic, and that Baker-street will continue to be the terminus for local traffic. A terminus in such a northerly part of the metropolis as St. John's Wood is not one which is likely to increase main line traffic to the North, and for purposes of public convenience, and for the future prosperity of the new system, we have little doubt that Baker-street is the proper place for a terminus. But, as we have more than once pointed out, it would be necessary to double the existing St. John's Wood line and spend an enormous sum of money in the purchase of land at Baker-street. The fact is that the main line of the Metropolitan is being constructed before a terminus has been found, and if one is built at St. John's Wood it will be rather that of the Sheffield Company than of the Metropolitan.

**T**HE Exhibition of the Institute of Painters in Oil Colours, which opened this week, is strongest in landscape, and contains some fine works of this class. Among these are Mr. Hughes-Stanton's "A peep of the Arun" (43), Mr. David Murray's "Hallowed Ground" (87), a scene in the churchyard of a village, very fine both in sentiment and colour; Mr. Wimperis's "A Fresh Day" (92), a heath scene with great piles of clouds travelling on the wind—a fine example of the old school of water-colour painting; Mr. Parton's "Summer days at Wargrave" (162), and Mr. Johnson's "Richmond Bridge" (636), Mr. Hope McLachlan's two landscapes, "A Pastoral" and "On Askham Common" (234, 244), are remarkable little works of their kind, but rather landscape *fantasies* than transcripts from nature. Among figure pictures Mr. J. H. Bacon's "A Song of Long Ago" (111) has real feeling and artistic power. Mr. Joseph Clark sends a picture entitled "Familiarity Breeds Contempt" (384) in which the figure of the boy seated on the left should be noticed as one of the best things in the Gallery; as a whole the picture is not as interesting as many of his. Mr. John Burr's "Better is a Dry Morsel and Quietness Therewith" (377) is a very interesting little work, and Mr. Hugh Carter, in "A Dutch Cobbler" (586) has achieved a remarkably good imitation of Israel. Mr. T. B. Kennington, who is never commonplace or uninteresting, sends two or three works, among a rather large one, "His Daughter's Balm" (237), representing an old man and his grandchild seated together, which is quite above the average level of the work at this exhibition, not only in execution but in the refinement and character shown in the two thin and sad faces. Mr. John R. Reid's various works give one in another sense rather a melancholy feeling—the work of a gifted artist who is going astray in search of an original style; he may be said to have found it, but it is a style

essentially false and sensational, in spite of a certain power of colour. Mr. Pullylove has a couple of little views of Ely Cathedral; Miss Maud Crutwell's cleverly-painted little works, "Students" (345) and "Egyptian Still Life" (376) show remarkable talent in their way; Mr. T. Farquharson has made a realistic study of "The Banks of the Nile" (561); and Mr. F. D. Millet has one of his interiors with a figure under the title "Michaelmas Daisies" (319) which, besides the general merit belonging to his careful and refined but rather inexpressive work, is remarkable for the brilliant colour effect produced from the jar of bright flowers which forms the central "accessory" of the scene. The Exhibition suffers, like most of its predecessors, from being too large and including too much work which can be of no value or interest except to cover the walls; it would be far better to hang fewer works and keep the standard higher. There are some (figure pictures especially), which we do not care to particularise, the admission of which into anything pretending to be a high class exhibition is absurd, and most detrimental to the reputation of the Institute.

**T**WO collections of works have been exhibited simultaneously this week at Messrs. Dowdeswell's Galleries in New Bond-street: a collection of pastels of Hampstead Heath views, by Mr. H. Muhrman, and a set of paintings of Highland cattle by Mr. T. Denovan Adam, an Associate of the Scottish Academy. Mr. Muhrman's pastels are marked by what we should deem an affectation of roughness of execution, and are certainly not suggestive of open air and daylight; and in some cases the worship of smudginess is carried to such an extent that it is difficult to tell what is intended at all. Mr. Adam's cattle-paintings, which are the result, we are told, of many years' study of the Highland cattle in their native scenes, are also somewhat rough in execution, painted with a certain defiant vigour which seems indifferent to superficial finish, but they are many of them very powerful works, and show the rough, shaggy, and almost truculent physiognomy of the animals with every appearance of truth. Some of the scenes are very fine in colour also, and there are some among the smaller paintings that remind one of Troyon.

**T**HE Pastel studies of wild animals by Mr. Nettlehip, now on view at Mr. Dunthorne's pretty little gallery in Vigo-street, are of unusual interest. In the note prefixed to the catalogue we are told that each of these studies is a direct record from Nature, the attitude and action being in every case drawn from the animal itself as actually seen at a given moment of action or repose. They produce the impression of truthfulness which this system would seem to promise, and many of them are remarkable examples of drawing. Among the best are the "Tiger stretching" and the "Tiger walking" (20 and 21), "The Bison" (22), the "Head of a Lion" (26), the "Polar Bear" (53) emerging from the water, and the "Young Lion" (62). Most of them, we believe, are studied from the animals at Regent's Park. The drawing of the "Wapiti Stag" (56) seems to fail in giving the true character of the head, which appears too heavy and blunt in shape. But in general these are very fine studies, and the author is not one of those who regards Pastel as a medium that affords an excuse for roughness of execution; the sketches are nearly as fine and delicate in finish as sketches can or should be.

**F**ROM a statement prepared by the Burgh Assessor of Edinburgh, it appears that the rental of the City for the year 1890-91, exceeds that of the previous year by the sum of 41,270*l.* The first valuation after the passing of the Act, for the year 1855-56, was 761,963*l.* 9*s.* 1*d.* That for the current year is 2,106,395*l.* 1*s.* 4*d.*, showing a total increase for the last thirty-five years of 1,344,531*l.* 12*s.* 3*d.* As Edinburgh is not a

manufacturing town, this increase is owing to its attractions as a place of residence. It is, therefore, incumbent upon the citizens to keep a sharp outlook upon any attempt to decrease the amenity of the city.

**T**HE final closing, as a Chapel Royal, of the Banqueting House, Whitehall, puts the period to the last stage in the history of the building. What the next will be remains to be seen. Inigo Jones's original plans are still preserved, we understand, at Worcester College, Oxford, to which foundation they were bequeathed by J. Oliver City Surveyor, who died, 1736. They would have covered an area of about twenty-four acres, consisting of seven courts, with frontages of 874 ft. to the river and St. James's-park, and return frontages of 1,200 ft. towards Charing Cross and Westminster. Three sets of them, differing in certain particulars, have been published, one in Campbell's "Vitruvius Britannicus," 1717, of which set the authenticity has been questioned; another, being four large prints, by Lord Burlington, 1748-9; and another, several plates, by Kent, 1727. A series may also be seen in the Crowle Pennant, at the British Museum; and there is a large collection of views and drawings in the Guildhall Library. When made three designs for additions to the Banqueting House for King Charles II., and after the fire of 1697, for King William III. Portland stone is said to have been used for the first time in its construction.\* Inigo Jones was paid 8*s.* 4*d.* a day, as surveyor, with 46*l.* a year for house-rent, clerk, and expenses. Nicholas Stone, his master-mason, received 4*s.* 10*d.* *per diem*. For the painted ceiling Rubens was paid 3,000*l.* The modern annexe, a sad disfigurement, by J. Wyatt, on the northern side, replaces a building which is shown in one of Hollar's set of views, that of the western front and Holbein's gate, which was deposited in the Pepsian Library, at Magdalene College, Cambridge. In a privately-printed chronicle of the Palace for the period 1514-1876, drawn up by Mr. Richard Massey who was organist to the chapel during the interval 1837-77, we read that the organ was the first built (1662) by Father Schmidt in this country. The carved oak case, and some of the original pipes, are preserved in the present instrument, which was altered in 1814 by Elliott & Hill; and again in 1844, under Massey's directions, by Messrs. Hill, when a swell organ and a solo organ on a fourth row of keys, with additional stops, were added. Purcell was a choir-boy here, and afterwards organist. In the Loan Collection at the Church Congress, Derby, 1882, was exhibited by the late Mr. A. J. B. Beresford-Hope, a picture of the interior of West Minster, showing the marble altar-piece, erected in 1705, by Wren's advice, which had been made "for a chapel [the old chapel marked in Vertue's plan] at Whitehall." This was replaced, *circa* 1820, with a compo. restoration of the old reredos, and that again by Sir G. Gilbert Scott's alabaster restoration of the same. The Banqueting House was converted into a Chapel Royal in 1715; and there, over the altar, were placed from 1811-29, some eagles and standards captured from the French armies. Sir Robert Smirke restored and refitted the interior, 1837.

**T**HE public recreation-ground, Maryon Park, to which we adverted last week, forms part of the original manor which King James I. gave to Sir Adam Newton, his son Henry's tutor. Newton employed Inigo Jones, a resident of Cherry Orchard, in Charlton parish, to build the existing house (1607-12), for which were planned a saloon and gallery, a chapel, state dining-room, and

\* The exterior was largely repaired, 1829-30, by Sir John Soane. See *s. n.* Soane, in "The Dictionary of Architecture."

† Inigo Jones was also the architect of Norton Court, near to Faversham; the Queen's House, Greenwich; and the front (centre) of Cobham Hall. Also, in this same county, are attributed to him Chatham Castle (portions), Judd's House, Depringe; Broom Hall; Chevening House; and Lees Court (front).



great hall. The west front was added by Sir Henry Kneivitt. The parish church of St. Luke, rebuilt 1630, is said to have been the second erected in England for Protestant worship. About twenty-five years ago the Dutch almshouses in Moorfields, under care of the Consistory of the Dutch Church, Austinfriars, were acquired by the London and North-Western Railway, and the charity was transferred to Old Charlton. The new Almshouses and Convalescent Home—see the *Builder* of May 14, 1887—designed by Messrs. E. P. Anson & Son, were opened by the Countess Charles van Dylant, wife to the Netherlands Minister. The cost of the extension works, about 7,000*l.*, was defrayed by the Consistory trustees. In the immediate neighbourhood Sir John Morden, Bart., founded, towards the close of the seventeenth century, the Morden College, which he endowed after his wife's decease with his whole estate and Old Court, of about 1,300*l.* a year, for decayed merchants.

THE School Board for London have just drawn up their annual schedule of sites and premises which they propose to acquire for purposes of school supply in the course of next year. These consist, in many cases, of additions to their existing schools. Allowing for two alternative sites in the Hackney Division, and for two others in the East Lambeth Division, the total number of new or enlarged schools is twenty-three (37),\* distributed in the Divisions as follows:—City: Swan-street, Minories, one. Chelsea: Marlborough-road and Droop-street Schools, two. Finsbury: Wellington-road and Blackstock-road Schools and Hildrop-crescent, all in St. Mary's, Islington, three. Hackney: Culford-road or Enfield-road, St. John's, one. Marylebone: Lydford-road, Paddington; Fleet-road School, St. John's, Hampstead; Stanhope-street School, St. Pancras; and Nightingale-street School, St. Marylebone, four. Tower Hamlets: "Ben Jonson" School, Mile End, one. Greenwich: Whitbread-road, Lewisham; Elizabeth-street, Woolwich; and Parrett-road School, Plumstead, three. East Lambeth: Grove-vale or Lyett-croft-grove, Southampton-street and Bird-in-Bush-road Schools, all in St. Giles Cumberwell, three. West Lambeth: Tooting Graveney (Broadway) School, one. Southwark: Albion-street and Midway-place Schools, Rotherhithe; West-square School, St. George-the-Martyr; and Alma School, Bermondsey, four. These represent an aggregate of 39,724 (78,622) square yards, or nearly 8½ (16½) acres.

WE have received a copy of Dr. R. Bruce Low's Report to the Local Government Board, on an outbreak of diphtheria in the parish of Brinkworth, in the Rural Sanitary District of Malmesbury, Wilts. The following are some of the facts given under the heading "Sanitary Circumstances," but which one would think ought rather to have read "Insanitary Circumstances":—

"There is no proper sewerage in the parish, sometimes slop-water is conveyed into the highway drains. The excrement disposal is by means of privy pits, which are emptied at irregular and often long intervals. The ashpits are not covered; their contents are from time to time removed by the scavengers, and are utilised on land. The water supply is from open ponds, locally called 'pits,' dug in the clay near to dwellings, the same pit sometimes serving several houses. In one instance six houses, containing nineteen persons, get their supply from a single pit. Occasionally the pit abuts on a pasture land, and in that case cattle and horses drink direct from it. These pits vary in size from about 4 ft. to 16 ft. square, according to the number of houses using them. The depth varies from 2 ft. to 5 ft. The water in most of these 'mud holes' (as some local medical men term them) is generally turbid, and the surface at the time of my visit was covered with a thick green scum. It was stated that in summer the water stinks, and even in spring time it smells unpleasantly. Most people have to boil it, as it is unfit for use when drawn from the pit. This green, stagnant, stinking water is merely collected rain-water on the clay soil, and contains quantities washed from the surface of the gardens and backyards. The pits mostly swarm with newts and other forms of animal life."

\* The figures in brackets are the corresponding figures for last year.

At the conclusion of the report Dr. Bruce Low recommends that the Rural Sanitary Authority should at once seek skilled advice and assistance with a view to obtain a better supply of drinking-water for the inhabitants of Brinkworth village, and that the present system of privy-pits should be abolished, and tub or pail closets substituted, arrangements being made for their frequent and systematic emptying. It is to be hoped these recommendations will be acted upon without delay; a moral duty, if it cannot be made a legal one.

THE opening of the Staffordshire Technical Art and Industrial Museum at Hanley, (Messrs. W. Sugden & Son, architects) was announced to take place on Thursday this week, Lord Dartmouth and Sir Henry Roscoe taking the honours of the occasion. In commemoration of the opening, Mr. W. L. Sugden one of the architects, has collected in a square pamphlet\* with a tastefully-designed cover a number of mottoes from eminent writers bearing upon art and industry. The cue for this seems to have been given by the painting of a certain number of mottoes on the frieze of the building by order of the Committee, and these are distinguished by being printed in capitals, the rest are Mr. Sugden's selection. The selection does honour to the good taste and judgment both of the Committee and the compiler, and forms a very interesting collection of noble and suggestive thoughts, in some cases from writers not much read or known at present. Mr. Sugden takes for his general motto, as a heading to the whole collection, the following sentence from Sir Joshua Reynolds:

"An Institution like this has often been recommended upon considerations merely mercantile; but an Academy, founded on such principles, can never effect even its own narrow purposes. If it has an origin no higher, no taste can ever be formed in manufactures; but if the higher arts of Design flourish, these inferior ends will be answered of course."

The first of the Committee's chosen mottoes for decorative purposes is the sentence from Isaiah—"To give unto them beauty for ashes, the oil of joy for mourning." Nothing could be more expressive and suitable. Among those selected by Mr. Sugden we may mention two, one a serious one, from Sir Matthew Hale—"Idleness is the nursery of vain and sinful thoughts"; the other a happy satirical adoption of the Archbishop's adieu to Gil Blas—"I wish you all manner of prosperity with a little more taste"; a wish that might be appropriately addressed to many a manufacturing town in England.

#### THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

##### THE PRESIDENT'S ADDRESS.

THE opening meeting of this Institute was held on Monday evening last at 9, Conduit-street, when the President, Mr. Alfred Waterhouse, R.A., delivered the following address:—

Gentlemen and Colleagues,—Since I last had the pleasure of addressing you at the opening of a new session you have conferred on me a great honour in electing me your President for a third year. I can assure you that I am deeply sensible of this proof of your confidence and esteem, and I take this opportunity of expressing my heartfelt acknowledgments, not only for the honour itself, but also for the kindness and forbearance you are ever so ready to extend to me.

I have to congratulate you on possessing premises much the better for the additions made to them by our Honorary Secretary during the recess. The room in which we are now assembled is certainly better lighted than it ever was before, and I hope we shall find from experience that it is better ventilated. It is now a convenient room in which to study and consult books. The original and restricted library and the old for the storage of the volumes forming our ever-increasing and most valuable collection, will make excellent committee-rooms; while the arrangements for the permanent staff and Council downstairs could

\* London: W. Reeves; Leek: T. Mark.

hardly be much improved so long as the Institute occupies hired premises.

It is gratifying to record that the direct representation of architecture upon the General Council of the Imperial Institute—a matter to which, in common with my lamented predecessor in this chair, I referred in a previous address, has been cordially conceded; the Councils of the Royal Academy of Arts and of the Royal Institute of British Architects will in due course send one representative apiece to the governing body of the Imperial Institute.

A communication made to the Council to-day will also be received by you with interest and satisfaction. You are aware that a sister of the late Owen Jones presented a sum of money to the Institute for the purpose of endowing a travelling studentship, worth annually 50*l.*, in memory of her distinguished brother. Miss Jones died in September last, and by her will the residue of her estate, amounting to about 2,000*l.*, is bequeathed to the Institute as an addition to the original endowment (applause).

##### The Examinations.

Since the commencement of last session the new system of progressive examination has come into operation. Two preliminary examinations for candidates qualifying as "Probationers" have been held in various centres, 169 students presenting themselves; of these, 62 have been declared exempt, and 77 have passed the examination, making a total of 139 who are qualified in due time to come up for the intermediate examination, which, as sufficient candidates have presented themselves, will be held for the first time this month. In addition, 54 gentlemen have passed the qualifying examination in architecture, entitling them to become candidates for associateship.

Every student intending to prepare himself for these progressive examinations should read the clear and complete account of them given by Mr. Cates in the *R.I.B.A. Journal* of January 23, 1890; and if a man is to take a creditable position as an architect in the future, he must begin by passing these examinations. It seems to me as essential at the present day to have passed them as it was in former years to have spent a certain period in an architect's office as a pupil. I do not say that both courses are not still desirable, even necessary; but I think it will soon be found that the passing of these examinations is a *sine quâ non*.

In this connection I would draw attention to a memorial from our colleagues in Edinburgh, supported by many distinguished names, to H.M. Commissioners for the Scottish Universities, recommending the establishment of a curriculum in architecture at the University of Edinburgh, and the institution of a degree or other University distinction for those who have successfully pursued it. The memorialists suggest what would be a proper course of study to lead to such a degree, and point out the advantages likely to accrue if effect be given to their proposals. They make appreciative mention of the Institute examinations, and it must be a cause of gratification to those who have architectural education at heart to find our Edinburgh brethren so anxious to continue what the Institute has begun, and even to go beyond it.

##### Bills of Quantities.

In my last address I animadverted on the impropriety of expecting builders, competing for the execution of contracts, to verify the correctness of the quantities on which they tender,—a practice, I believe, adhered to by H.M. Office of Works after it had been discontinued by London architects generally. This led to your Council addressing the Commissioners of Works on the subject, and brought, I am happy to say, a speedy reply to the effect that the practice would be discontinued. It is to be hoped that the high example thus set will be followed by those bodies in the provinces who may still adhere to what we cannot but consider an objectionable practice, not justified by equity, and calculated to bring the functions of the quantity surveyor into disrepute.

##### Deputations from the Building Trades.

We have received two deputations from several of the building trades, inviting us to use our influence for the insertion of certain clauses into our heads of builder's contract:—1st, to prevent the subletting of any portion of the work; 2ndly, that all labour employed by the contractor should be of the best quality; and 3rdly, that the contractor should not pay



less than the recognised or trades-union rate of wages, and should observe all recognised rules or customs as to working hours. The proposals of the deputation met with the consideration which they merited, without the Council seeing its way to take any collective action in the matter. Mr. E. T. Hall has communicated his views in an article contributed to the July number of the *R.I.B.A. Journal*, going fully into the subject, and showing in what trades subletting is practised in London and to what extent. He takes the view that, when subletting is allowed in the interests of one's clients, as, for instance, when stone is wrought in or near the quarries, instead of in London, and the general contractor, knowing that such a permission will be granted, reduces his tender accordingly, it may be our duty to allow it, especially when, though it may deprive the London masons of some work, it will give it to others probably equally deserving in the country. Few will, I think, disagree with him there.

#### Building Legislation.

Among the subjects which have engaged our earnest attention during the past session, none is of more importance, in my opinion, than the revision of the Acts which affect building operations in the metropolis. The general public may view the subject with apathy, as not understanding how vitally it affects its comfort, health, and well-being; in fact, the very magistrate on whom devolves the administration of the said Acts in cases of dispute is said to hate the sight of the District Surveyor when he brings his unfathomable technicalities into court. When, therefore, apathy, or disinclination to unravel the threads of a complicated and perplexing subject, is so general,—though the subject itself is so essential to the well-being of the community,—it is the duty of men, whose education and experience fit them above all others for the task, to help those engaged in the framing of such Acts with their advice and assistance. Now, this is precisely what the Institute has been doing.

A paper on "Building Legislation," read in this room by Mr. John Slater, in February last, was the theme of, and prelude to, two very interesting and important discussions, and to correspondence conducted by those who may be called specialists in this matter. Those who took part in them seem to be agreed almost unanimously that the time has at length arrived for the codification and thorough amendment and simplification of the some fifteen or twenty Acts and amendments of the same which now regulate building operations in the metropolis. A warning voice, however, that of Professor Aitchison, was raised against our striving after perfection,—by making the cost of houses too great for those who are to live in them. Others objected to building regulations being too definite, so as in some cases to become tyrannical and absurd; but it seems to me that because an existing definition may be found to work in this way in practice,—as, for instance, the clause in the Act which limits the sum of the openings in a wall to half its total area,—it is a reason for the amendment of the clause rather than for its exclusion. The fault, in my opinion, lies not with being too definite, but with the definition not being broad enough to meet with varying contingencies. The Act of 1855 having been framed chiefly for preventing the spread of fire from one combustible wooden-floored building to another is out of touch with improved fireproof construction, which ought, when properly applied, to allow of an increase in the cubic contents of buildings beyond the area now prescribed, at least, where the building does not contain goods of an inflammable description. The Act does not allow for the increased amount of glass called for by the ever-increasing pollution of our atmosphere; and, on the other hand, does not make due provision against the danger from fire incident to the use of lifts. It does not realise our greatly extended requirements in the present day; nor our extended building knowledge—our knowledge, for instance, of the treacherous nature of stone and iron in case of fire. The Act does not deal with important questions affecting the rights and obligations of adjoining owners; it does not concern itself, except by implication, with the underpinning of party-walls and of adjoining structures in cases where the new structure, going below the old one, affects the safety of the latter, and involves such a procedure. It ignores sanitation; and does not trouble itself

about the formation of new building estates, where, of course, the evils we have most to deplore in our streets and thoroughfares can be most readily prevented. Mr. Slater urges, with reason, the necessity either of making our Building Acts of the future sufficiently expansive to meet such cases, or of giving our district surveyors a discretionary power to enable them to deal with special cases in a practical way, and probably his first alternative would present, in practice, the fewest difficulties.

The meeting in this room, when this subject was so fully debated, did not feel itself justified in sending Mr. Slater's valuable paper and the report of the discussion to the London County Council, but it is to be hoped that your Council will see its way very shortly to take decided further action in the matter; the urgency of this subject has been pressed upon us lately by the London Council (General Powers) Bill, which appearing at first as if it chiefly related to a bridge at Barking Creek and the acquisition of a new park for South London, was in reality of much more widespread interest. It proposed, in fact, important amendments in the metropolitan building regulations, some of which could not be looked upon with favour. Action was thereupon speedily taken by your Council, and a memorial addressed to the London County Council on the subject. We pointed out that many of the changes proposed were of temporary expediency, and many wanted further consideration, as, for instance, those clauses affecting sites at the corner of two streets, in one of which the line of frontage had to be set back, where the owner of the corner site would have had to set back also without compensation, and to set back the heights of new buildings. We further pointed out the desirability when an application was refused, so as to enable the applicant to amend his designs to meet such objection. We also respectfully remonstrated against this indirect mode of introducing legislation affecting seriously private rights and questions of principle; and urged the advantage of promoting a thorough amendment and consolidation of the metropolitan building regulations. Some of these recommendations were accepted by the London County Council and their Bill was amended accordingly.

One of the most important provisions of this new Act is the establishment of a Court of Appeal in questions of lines of frontage, &c. The Court is to consist of three members: one appointed by the London County Council, one by your Council, and another by that of the Surveyors' Institution. The County Council deserves praise for its initiation of this reform—or rather this revival, under fresh conditions, of a tribunal established by the Act of 1844, but which from its peculiar constitution became a dead letter; and I sincerely hope it will work so well in practice as to show the propriety of giving to such Courts greatly extended powers in the future. The Act also fixes for the first time in London a limit to the height of new buildings not being the rebuilding of existing structures of a greater height. Ninety feet is the limit, exclusive of two storeys in the roof, and of exceptional features, such as ornamental towers or turrets and dormers. This should satisfy even the most aspiring among us; if it does not, there is still the right of appeal to the tribunal before referred to. It is with pleasure that I allude to the part taken by this Institute in criticising, amending, and, I may add, ultimately aiding the passing of this Bill. As an entirely disinterested body, and yet one most fully able to appreciate the tendency for good or evil likely to result from any change in building regulations, it is only proper that its voice should be heard and well considered at such a juncture; and it is gratifying to reflect that in this case the Institute was represented by Mr. Cates, who—the *locus standi* of the Institute having been admitted—claimed and successfully sustained the right to be heard personally on behalf of your Council, and to adduce evidence in support of our petition, without the costly intervention of counsel. His observations and the evidence given by Mr. E. T. Hall, on behalf of the Institute, were received with marked consideration by the Lords' Committee to whom the Bill was referred; and I am glad to state that both these gentlemen have received the special thanks of the Council for their very efficient services in connexion with its passing.

I cannot but feel, however, that even were we to get the most perfect Building Act for the

regulation of our practice, it should be the function of some one,—or rather of some collective body,—to take a broader artistic view of that immense chaos called London, and, as opportunities arise, to point out in what way it can be improved as a work of art. The masons composing such a body must be, I admit, men of business as well as artists; or their recommendations would soon cease to have any practical value. In laying down the line of a new street, it would be their duty to see that its extremities either ended in some existing building worthy of closing the vista,—as, for instance, the Strand, in the Church of St. Mary; or, that a site was reserved for some future erection with that object in view. It would be their duty to see that the best sites along its course were reserved for buildings of a character becoming their position, and that a flagrant want of harmony was not suffered in contiguous elevations; and, while always dealing indulgently with such as were modest and refined, the tribunal would be resolute in refusing the acceptance of designs of vulgar ostentation,—creations of the nightmare school, of which, unhappily, we have examples already thrust upon us. Indeed, we may have more of these erections,—the worst form of inflated advertisement,—the worst because it involves the prostitution of a noble art, and when once erected, is not easily got rid of. I am not forgetful of Professor Kerr's pathetic inquiry, "if Heaven has made us Philistines, how can we help it?" But this, as it seems to me, is hardly a question of a man's right to do what he will with his own, provided he does not injure his neighbour. A street is public property, made not only for the use, but for the enjoyment, of the public, and it cannot be an enjoyment so long as it is vulgar or monotonous and ugly. I plead for the creation of some responsible body of men, by position, education and cultivated taste, specially fitted for the task, whose main duty should consist in advising upon and controlling, from an artistic point of view, those works on which the future of London so much depends. I repeat the words I used in my address of last year, that a member of the Architectural Council, to be appointed by the Government, and to be partly composed of professional men, is wanted in London. It is most difficult for those who have had no technical training to judge correctly of the probable effect of a contemplated building from an inspection of the drawings prepared for its erection. I plead, moreover, for the public exhibition of the plans of all metropolitan improvements prior to any final decision being taken upon them. Such a course would tend to create an intelligent interest in improvements which at present does not exist in London, and it would enable those who have to pay for them to consider in time if the proposals be good, practically and aesthetically, or otherwise.

We have obtained a tribunal before which certain building cases defined in the "London Council (General Powers) Act" will be tried, and if success attend the labours of this tribunal, other and perhaps more important matters relating to building may be referred to its judgment. So far so good. But more wanted—namely, an Architectural Council of National Works, which should also be entrusted with the consideration of proposed improvements, and of all those questions, I repeat, on which the future of London so much depends.

#### Students' Work.

The system recently inaugurated of publishing criticisms on the work of students competing for the various scholarships and prizes offered by the Institute itself, or by other bodies under its administration and direction, is to be regarded as one of great value. It shows an unsolicited student wherein he has failed, and so guides him to a better chance of success in the future, pointing out even to the winner how to attain greater excellence, if willing to listen to the friendly advice of experience. It would again venture to remark, with reference to the work of those to whom Travelling Studentships are awarded, that what we should like to see is not mere evidence of their industry,—that is seldom or never wanting,—but a greater desire to make quality, apart from draughtsmanship, and not mere quantity their aim. The student, nowadays, sometimes possesses of the restless restlessness of the locomotive engine:—stays, it may be, but a day in a place, that day, to be sure, he does a marvel.



amount of sketching, and he contrives to visit in the time which he has to devote to his studentship an astonishing number of interesting buildings, the most salient features of which he transfers to paper. I do not see, however, as often as I should like, that the student has sat down before a building to lay siege to it with the determination before he has done with it to make it his own,—to enter into the spirit of its builders, and to seek to discover their way of arriving at the ends they had in view. There should, in my opinion, be among our students a little more of the thoroughness which characterises the work of the French students, whose magnificent studies displayed in the Galerie Rapp, in last year's Exposition, so much impressed those of us who had the opportunity of examining them. I say "a little more," because in France, perhaps, this work is carried out with too great elaboration. Still, I would have our students make themselves so conversant with any work they analyse as to be able to pass an examination on its construction and features; and I think it would be well if the knowledge thus previously acquired by the candidate in the study and delineation of some ancient example were put to the test in our examinations more strictly than appears to be the case. Those who read for their amusement, or for their fancied instruction, do not generally read half so carefully as those who know they are going to be examined on what they read. And so I believe it is in objective drawing. If the painter-student knew he were going to be judged, not by his actual study from the life, but by what he could put of it on paper from memory afterwards, would not his attention be quickened to every subtlety of curve and proportion? Would he not become by such practice the reader artist? If the architect-student knew that it was not by the mere number and beauty of his sketches, and by the accuracy of the measured drawings of old edifices, that he would satisfy those who had sent him forth on his travels, but by the proofs he was able to afford that he had absorbed and digested what he had seen, I believe our student-work would sometimes be more thorough, and the men themselves in some cases would be the more ready designers after having had such preparation. Having got the ancient examples into their heads, instead of merely into their sketch-books, they would learn to lean not on illustrations and other extraneous help, but on what had become a part of themselves, and so prove not mere copyists, but self-reliant and original designers. Of course, if such careful analysis of a single example of architecture is recommended to the student, it is highly important that he should know beforehand what buildings will best repay the time thus devoted to them; and it would be a work of very great interest and utility if those best qualified for the task were to catalogue such buildings, giving at the same time their date and most noteworthy features and characteristics, not disdaining to mention also their distance from the nearest railway station, and the existence and name of the neighbouring inn, if any. There is abundance of such information in a scattered form in our professional journals, and in the fascinating papers read by the rambling architect; and I do not forget the more substantial work which the Architectural Association some time ago undertook and carried out for certain localities. Still, a complete and concise list would be of inestimable service to every one of us, and if divided into counties, each with a short introduction as to the county's leading architectural characteristics, and with a good index to the whole, would be of easy reference. It would be of special value to the student, who should, of course, be encouraged to go where he could study good architecture rather than redundant and often misapplied elaboration.

The President of the Royal Academy, in his recent discourse on Spanish art, devoted much of his attention to Spanish architecture, a difficult subject, but treated by him with perspicuity and breadth of view. The interest which his address awoke in me led me to visit Spain a month or two later, and to notice the justness of the conclusions arrived at by our distinguished honorary member, who has shown therein his grasp of the intricacies of our art. Spain is a country which all architects ought to see, though the difficulties of locomotion and hostility are still such that few can hope for more than a partial acquaintance with its architectural wonders. For the reasons pointed out by Sir Frederic Leighton, the visit ought to be postponed until the student's views are

formed, or he may be led away by much that is as pernicious as it is alluring.

#### Architectural Training.

A question is often asked as to the best mode of training a youth intended for the profession of architecture. How should the early days of one who intends to study architecture be a calling be spent to the best advantage? To such I reply: He should have received in his schooldays some preliminary training of a scientific as well as of an artistic character. He should learn early to understand and appreciate the beauties of a fine building,—of the civic and domestic edifices, the grand cathedrals and churches, the noble streets and open spaces, with which many a city in this country is endowed. He should be taken to museums of "comparative sculpture," such as the initiative of Viollet-le-Duc created in the Trocadero; and, in default of similarly arranged educational institutions at home, to the sculpture galleries of the British and the South Kensington Museums. In fine, he should, in his early pliable days, be shown the works,—or casts or drawings of the works,—of the great architects of various countries, and thereby acquire an insight into the magnitude, the nobility of the career upon which he is about to enter. At the same time his ordinary education,—the ordinary education of an English gentleman,—should not be neglected. He must pass the matriculation examination of a university, or the local examination conducted under the authority of a university; or he must obtain some testimonials of proficiency granted by well-known educational bodies. Then, armed with such letters of introduction, he should come to the Royal Institute of British Architects, where I know that he will be cordially received; and thereupon, after the necessary inquiries as to his certificates and after examination of his powers of draughtsmanship, he will be admitted a Probationer. His name will be entered on the Register of the Institute as one intending to qualify for admission to the Class of Students, and afterwards to the Class of Associates, of the Institute.

His next proceeding is to be attested, say, for three years, to some practising architect on the conditions suggested in the form of articles which has recently been published,—a most important item of which states:—

"That, with the object of enabling the pupil to qualify himself for passing the examinations for studentship and associateship of the Royal Institute of British Architects, he, the Principal, shall and will allow the pupil such absence as he, the Principal, shall deem reasonable for the purpose of attending lectures, classes of instruction, and the said examinations."

During the term of his articles the pupil, or rather the probationer, to whom I am alluding, will have to prepare the "testimonies of study" (described in the *R.I.B.A. Calendar*), which he has to submit to the Board of Examiners before he can be admitted to the intermediate examination; and to assist him in the preparation of these "testimonies" in London he will, if properly advised, become a member of the Architectural Association, attend its classes, periodical visits to buildings, &c., and thus mix with others engaged in a similar course of study. During all this period, the reference library of the Institute is open to him, and he can borrow books not only from the lending library of the Association, but also from that of the Institute. At the end of his articles he passes the intermediate examination, is qualified as a student of the Royal Institute of British Architects, and his name and address are inserted in the Register of Members of the Institute, and published in our *Kalendar*. He afterwards competes for the prizes offered by the Association, and then for those offered by the Institute. He gains a prize, perhaps a studentship, which enables him to travel in France or Italy, or even as far as Greece. He returns to England, enters an office as assistant, prepares his probationary work for the final examination to qualify for candidature as Associate; he is admitted, he passes the examination, is registered Associate, and instead of being a mere stranger to those whom he will hereafter call his professional brethren, he is known to many of his elders, and counts among his contemporaries numerous friends. I confess, gentlemen, that this record of the younger days of an architectural student seems to me a fairly complete one. No President of this Institute, forty or even twenty years ago, could have told a similar tale. I remember nothing in my early

days as a pupil which approached the facile and systematic training of the course now laid down by us for admission to our ranks—ranks which I think must ultimately include the entire profession of architecture in the United Kingdom.

I have endeavoured to describe what the education of the young architect should be upon existing lines. Possibly, in a not distant future, we may find it better to use a course of instruction somewhat analogous, let us say, to that pursued by Professor Ware\* in New York, as a preparation for entering an architect's office, than that theoretical instruction of the sort just indicated should go on *pari passu* with pupillage. For a pupil to reap the full benefit of his time in an office, he should be as soon as possible find himself set to practical work, and work of this sort in a busy age can hardly wait for one who spends a considerable portion of his time in abstract study. After his class work is once completed his powers will be so strengthened thereby as to allow of his entering upon office work with an intelligence unknown to the ordinary pupil of the present day, and his term of pupillage might be greatly shortened were it to follow rather than be contemporaneous with theoretic training.

#### The Architectural Association (London).

For many years the professional education of our pupils has been assisted by the well-directed efforts of the Architectural Association, which received a flattering encomium from Viollet-le-Duc in 1872, at a time when, numerically, it was not much more than half as strong a body as it is to-day. Its method consists in the members helping themselves and each other; and no better can be devised. The particulars of its *modus operandi* are all well known to you; but I must not omit to mention that the General Committee of the Association recently formulated a systematic course of instruction to meet the requirements of the Institute examinations, the programme of which course was to include the study of the principles of design and construction on the drawing-board in class,—a practice pursued in the Royal Academy schools with success. I hear, however, that this more complete system of instruction was not adopted by the general body of members of the Association, and that the inauguration of the scheme has been postponed.

I reiterate what I said last year from this chair, that the Institute should, if the way be made clear, give substantial aid to those who, during a long and prosperous period, have shown an earnest determination to help themselves. But how or in what manner this helping hand should be offered to the junior body—how it would be received, or whether it would be taken at all—are points which do not appear to have received due consideration from those most concerned. Are we to indirectly support the Architectural Association, when it has made up its mind as to what it would like to accomplish in the way of teaching, and when it asks the Institute for aid? Or are we to set on foot some corporate machinery of our own for the systematic instruction of those members of the Association and others who are studying to pass the progressive examinations of the Institute? These are vital questions, gentlemen, which demand our most serious attention; and I will attempt, with your permission, to lay before you a short statement of facts relating to them.

At the present moment the educational work done by the Association does not appear, from the statistics with which I am furnished, to afford any great material assistance to the Institute. The Association numbers 1,129 members, of whom 276 are also members of the Institute, and 40 more are probationers of the Institute. The total number of our probationers is already 164, and, as I have just said, of these only 40 are members of the Architectural Association. Again, the number of applicants admitted to the preliminary examinations to be held this month in Bristol, Glasgow, London, and Manchester, is 73, of whom only 10 are members of the Association; while not one of the 8 probationers admitted to the first intermediate examination in London is a member of the Association. One thing therefore is certain: the relative positions of the junior and senior bodies of our profession in the matter of recruits has undergone,

\* I commend Professor Ware's Paper on "Instruction in Architecture," read before the Alumni Association of Columbia College, June, 1888, to those interested in the subject.



or at least is undergoing, a great and sensible change. The Institute has emerged from the state of a dilettante society into one of an eminently business-like kind, with recognised functions of a public as well as professional character. The Architectural Association, on its own showing, does not appear to possess at present the means to adequately fulfil the functions of a teaching body. In former days the architectural student first joined the Association, and then, in the course of years, the Institute. The position of affairs may now be said to be reversed. The aspirant's first thought is to qualify for registration as a probationer of the Institute; his next, perhaps, if he live in London, is to join the Association for the purpose of qualifying for the studentship, and afterwards for the associateship, of the Institute. Such being the case, it behoves us to look the new aspect of our relative positions in the face in a business-like way.

The General Committee and the subordinate Committees of the Architectural Association are largely, if not mainly, composed of members of the Institute; and the instructors in most of the classes are members of the Institute. The Association holds its general meetings in the Institute rooms; when its honorary secretaries apply for the use of a room in which to hold a class, the Institute lends one. Every member of the Association under twenty-three years of age has the use of both the reference and the lending libraries of the Institute; and any member over that age, if he ask permission, is allowed the use of the Institute library, which, as a matter of fact, is open all the year round to every architectural student properly recommended. The presidential addresses, and many of the papers delivered to the Association, are published in the *Institute Journal*, and the pages of our *Journal* are open to members of the Association on almost the same conditions as to members of the Institute. The President or a representative of the Association has a seat at the Council table of the Institute; in fact, it has the right, under our by-laws, to be there represented. The actual connexion between the junior and senior bodies is much closer, much more intimate, than the majority of those who talk about the subject are aware; and the Institute has never seen cause to regret the closeness of that connexion. It sees with interest and approval that the Association is asking itself the pertinent question whether the facilities it affords to students desirous of working in its classes are sufficient for the requirements of the time, and whether several things which involve considerable outlay of Association funds might not with advantage be abandoned with a view to augmenting the sum available for teaching purposes. At the present moment, in spite of the close connexion which exists between the Institute and the Association, in spite of the fact that we both inhabit the same building, the two bodies maintain two distinct libraries and two distinct registers of architects' assistants; the two bodies publish two distinct *Kalendars* and two distinct *Journals*. Now, though fully alive to the advantages of healthy competition, especially to the young and aspiring, I question the utility of this doubling our labours if not our expenses; and from a business point of view alone, I venture to urge upon the members of the Association the desirability of considering, in conjunction with the Institute, the present duplication of our expenditure and consequent division or diminution of our forces.

If I may be allowed to make a personal suggestion, and one in which I have had as yet no opportunity of consulting the Council of the Institute, I should say, let us join, not divide, our forces, and in such a manner that, while maintaining the autonomy of each body, the Association might devote its funds more exclusively to teaching purposes. We already house the Association for its general meetings; why should we not house its library, leaving the administration of the same to its honorary officers? Why should we not combine the two registers of assistants in one, to be kept in the office of the Institute by a clerk, who should also answer the many and often unheeded applications that I understand are made on the subject of the Association's membership, its classes, &c.? Why should we not include the *A.A. Brown Book* in our Annual *Kalendar*? Why should we not devote a definite portion of our journal to the able pens of the Association? Here, at least, are points which a joint Committee of the two bodies might well consider, and in suggesting them I have only to

repeat that I do so on my own personal responsibility; and, further, that I have no thought or wish to see the two bodies, senior and junior, welded into one. On the contrary, any such amalgamation is impossible under the present constitution of the Institute; and, even were it possible, it is not, in my opinion, desirable in the interests of either the Institute or the Association.

I have been much struck with the excellence of the lectures which the Association obtains from its members and others. There was a paper read last session by Mr. Frank T. Baggey on "Angles and Terminal Features," which was a well-considered essay on an important element of design. There was also one by Mr. Reginald T. Blomfield on "Drawing," which took a broad and masterly view of the art. The power of draughtsmanship exhibited of late by many a young architect is of such excellence that it ill becomes an old fogey to criticise it, and yet I would venture to emphasise what Mr. Blomfield advocated: that it would be well to consider before beginning a drawing what the qualities and impressions are we wish to perpetuate and convey to paper, never to draw a stroke which has not a definite purpose in view, and to avoid not only conscious tricks and mannerisms. I would not discourage the delineation of cast shadows and reflected lights, for in them much of what is most delightful in the aspect of an architectural work depends; but the shadows should be as flat as possible, and the reflected lights as tender. The scratchy, unrefined style adopted by some who are otherwise masters of pen and pencil delineation, is in my opinion much to be deprecated, and a return to the brush would be desirable if such blemishes cannot otherwise be avoided. It would be well, also, if our students spent some of their energies in studying cloud forms and vegetable growth, as many an excellent architectural drawing is ruined by the introduction of clouds and trees which often mar otherwise attractive work.

#### Arts and Crafts.

The "Arts and Crafts" are still holding their annual exhibitions in the New Gallery, and doing the work which I cannot but think ought to have been done, and still would be done, by the Royal Academy of Arts, if it took a wider view of its mission, and gave itself to the hearty encouragement of all branches of art, instead of mainly to painting in oils, with scanty patronage of water-colour art, sculpture, and architecture, so far as the last can be illustrated by the pencil and brush. Its winter exhibitions of old masters have been hitherto of great value, but the supply of masterpieces belonging to those generous enough to lend them must in time become exhausted. I am, therefore, personally not without some hope that the future may find the Royal Academy inclined to look with favour on a winter exhibition which will embrace Art in all its forms, and which will do more for national art progress generally than a mere exhibition of pictures is likely to do. Meanwhile, let the younger members of our profession whose time and talents may not be fully occupied in the pursuit of architecture proper, devote themselves to the design of such things as are to be found in the Arts and Crafts Exhibitions, which, to be successful, must be designed on sound principles for the observance of which the architect's training renders him peculiarly apt. The exhibitions in question are undoubtedly of great interest, but not as yet of such surpassing excellence in all their departments as to discourage earnest attempts to make them better. I feel persuaded that no body of men can apply themselves to such a task with better chance of success than architects, no work could be more useful in raising the art tone of the community, and in this way elevating the public appreciation of architecture itself.

The President and Council of the Arts and Crafts Society have been good enough to invite the Institute to visit their exhibition at the New Gallery, on the evening of Tuesday, the 11th inst., and the invitation has been cordially accepted. I hope to meet a large gathering of our members there, that we may discuss with the craftsmen whose works are there exhibited points of mutual interest and importance.

#### The Library.

It should be borne in mind that the prosperity of the Institute as a corporate body is not exclusively dependent upon the exertions of its

members alone; it cannot afford to "dispense with the goodwill of outsiders indirectly connected with the objects for which the Institute was founded. The list of donations made to our library in the course of the past session suffices to show that we possess many friends and supporters whose names are not included in our register of subscribing members, but who are, nevertheless, helpers in the good cause, and in the good work we have at heart. Monsieur Edmond Bonaffé, of Paris, has presented his admirable work on the "French Furniture of the Sixteenth Century"; Monsieur Lucien Magne, the son of an architect distinguished for the works executed in Paris from his designs during the rebuilding of that capital under the Second Empire, has presented two folio works of his own on French architecture, recently published; Monsieur Planat, regularly sends his "Encyclopædia of Architecture and Construction"; Herr Stier, of Stuttgart, has given us a magnificent folio of illustrations of buildings recently erected in Germany; Mr. William Scott, who duly passed the Voluntary Examination, but who now works in Venice, has given us some excellent views of that city, etched by himself; and Mr. J. Drayton Wyatt, who is well-known to most of us, is a determined contributor of rare and useful works and of valuable pamphlets. The late John Turner, a member of the Architectural Society, which in 1834 was absorbed in the Institute, but who never joined us, bequeathed some beautiful drawings and a most interesting MS. work of John Goldicutt, the first Hon. Secretary, with Professor Donaldson, of our body. Some conspicuous presents have also been received from members, notably, a large collection of Daniel's original drawings of Hindoostan, the gift of Mr. John D. Crace, which formed the subject of an interesting notice by Mr. William Simpson in our *Journal*; and a large illustrated folio work by Mr. Frederic Chancellor, of Chelmsford and London, on the "Sepulchral Monuments of Essex."

#### A French Architect on English Work.

One of the donors I have mentioned, Monsieur Lucien Magne, has recently written a criticism of the British architectural drawings exhibited last year in Paris. He thinks that our works are distinguished by their quality of picturesque composition, but they lack, he says, that original note which is the result of the proper appropriation of details and profiles to the desired effects of light and shade. Modern English architecture is of particular interest to our French confrère, in that it does not appear to be the expression of conventional teaching; but, on the contrary, a manifestation of particular wants. In the irregularity of plan, in the determination to give to each part of the façade a form resulting from the destination of each room within, Monsieur Magne sees a reminiscence of the traditions of our art in the Middle Ages and the early Renaissance. He then goes on to compare the design for the Imperial Institute with the majority of the compositions of the *Pensionnaires-de-Rome*, and says that in it Mr. Colcutt displays a liberty and boldness in his disposition of masses, an elegance in treating the silhouette of his building, which are not often to be found in the contemporary work of French architects. Such praise, coming from such a pen, is, of course, very gratifying to us; but it contains also a note of warning against the dangers attendant on the established teaching of architecture, not as a science but as an art. I hope we may carefully lay to heart the true lesson which our French confrère in so many generous words would instil, not to lose our freedom and liberty in design by receiving the formulae of an architectural education conducted everywhere on the same lines. I do not think there is at present any danger of this. The exercise of our liberty grows with what it feeds on; indeed, it seems to tend in many cases to licence, and there are modern buildings in this country which display in their details a recklessness of what thoughtful men, with ordinary reasoning powers, consider appropriate.

#### Contemporary Works.

One of the dangers to be dreaded in alluding to contemporary work is that it may not have been my good fortune to have seen some of the best and most characteristic specimens of it, and that, therefore, mention of them may be unintentionally omitted. Speaking generally, I cannot help noticing a curious tendency in the work of some of the most esteemed of my con-



temporaries; the introduction in the same building of parts avowedly made to look as if designed by different people in different ages. We rightly appreciate the charm which is given to old buildings by the work of successive generations. The craze for the destruction of everything not of the original period of a building's history in its restoration has now happily passed away, and we are zealous to preserve the history written in the stones of our buildings as we find it, if there is no imperative reason for its removal. But surely that is a different thing from constructing fictitious history. If we cannot help being eclectic in some sort, ought we not at least to try to produce a harmony in our work, and leave it for others who shall come after us to introduce other styles and modes of detail? I feel it the more incumbent on me to say so, as having myself spontaneously sinned in this respect in my youth, and once or twice lately at the instance of clients, who frequently, without due consideration to harmony and fitness, insist on the repetition of forms and details which have pleased them elsewhere.

The tendency of our work in this country at present is unquestionably towards smallness of parts: we strive for the picturesque rather than for grandeur, and lose much thereby. As an instance of a reaction against this tendency, I would venture to speak of Mr. Sedding's Sloane-street Church, with its two fine campanili, its magnificent windows, and its nave wider than that of St. Paul's Cathedral.—In fact, to the unusual aspect of breadth and space which he has imparted to the structural parts of this fine work.

Another instance of the dignity begotten of a broad and simple treatment, in the hands of a master like Mr. Norman Shaw, is the new central home of the Metropolitan Police. It is a building which forces itself on the attention, and gives pleasure in no ordinary way, however much the critics among us may think they could improve it in a detail here and there.

Mr. Pearson is to be congratulated on the magnificent effect of his new front to the north transept of Westminster Abbey. I am told it is nearly line for line what was there before, and yet the impression produced is very different. This difference arises not merely from the newness of the stone, but from a certain artistic fluency and thirteenth-century flavour about it which the poor pared-down and sadly mutilated old skin certainly did not possess.

#### *Westminster Abbey.*

The Royal Commission on Westminster Abbey, convened to consider the building's capacity for further interments and monuments to the most illustrious of Her Majesty's subjects, has not yet reported progress; but I may here mention, as the inquiry has been a public one, that though there is room in the Abbey for some eighty more interments, there seems to be no more space for monuments without doing still further injury to it in the future than has been done so ruthlessly in the past. The objection to the removal or rearrangement of any of the monuments, however destructive to the general appearance of the interior of the Abbey, or revolting to the taste of the day, seems insuperable in the present state of public opinion, and under these circumstances various schemes for erecting a memorial chapel within the precincts of the Abbey have been laid before the Commission, and duly considered. They will shortly be reported upon. Unanimity, however, on such a subject is not to be expected; all that can be hoped for is to lay before Parliament and the public some scheme which will secure a fitting place of sepulture and memorial for the most illustrious of our fellow-countrymen, of sufficient space and dignity for the proper display of sculptured monuments, and at the same time so intimately connected with the Abbey itself as to partake of its prestige and worthily continue its traditions as the last resting-place of those amongst us held most in honour.

#### *British Art Gallery.*

It must be a matter of congratulation to every art-loving Englishman that, through the generosity of Mr. Tate, in presenting his splendid collection of pictures by our countrymen, under certain conditions, to the nation, we are at length to have the nucleus of a gallery devoted exclusively to the British school of painters and sculptors. It is true that these works will be at present poorly housed architecturally, though those best fitted to judge consider the galleries at South Kensington

excellent as to light. It is to be hoped that in the near future some other munificent benefactor may arise, and by building them a fitting shrine associate his name with that of Mr. Tate and the masterpieces of British art, as the name of Mr. Alexander will be for ever associated with our National Portrait Gallery by what he is so generously doing for the nation under the able guidance of Mr. Christian.

#### *St. Paul's Cathedral.*

I have been invited, as your President, to say something about the painted decoration of St. Paul's. If I have hesitated to do this, it is chiefly because I do not know enough about the intentions of those who have charge of the work. The painting of the stonework near the reredos is at present obviously incomplete, and so it is impossible to judge of its ultimate effect; but few have shown themselves better fitted, by what they have done elsewhere, than Messrs. Bodley & Garner to advise in such a question.

It is certain that Sir Christopher Wren painted in oil paint the walls of the nave and nave-aisles, and therefore some may say we have his authority for painting them again. It will hardly be questioned, however, that one of his motives for doing so was to avoid a worse evil: the disintegration of some of the stonework of the interior from damp. This, at any rate, seems to have been the case at the west end of the church; in the choir, I have been informed, distemper was used, which seems to indicate that, paint having been resorted to in part of the church, it was found necessary to bring the rest of the fabric into harmony with the painted part. When the cathedral was warmed with hot water, the coating of paint was no longer necessary as a preservative, and so it was removed and the colour wash removed with it. The stone has now a charming variety of tone, heightened in places by the white mortar in its pointing, and I think it a very grave question whether we shall ever get any painted decoration as satisfying as, or approaching in dignity and solemnity to, what we have now in the warm and varied tones of the masonry, smoke-begrimed and dingy though they undoubtedly are. Whatever may be thought of its sculpture, mounted on a red marble background, and relieved by partial gilding, the reredos appears to me in its architectural portions to be a work worthy of its surroundings; but I confess I am very jealous of its being treated as the keynote for the whole cathedral in point of colour, and should be inclined to question the advisability of any scheme of decoration which, in order to secure harmony throughout the whole building, would involve the repainting of the walls generally. If such renovation be determined upon, where is it to stop? Can it stop short of the western doorways? I am bound to admit, however, that the great architect of the building suggested such a treatment by what he himself did in its eastern extremity; though he, perhaps, here allowed himself, in the obscurity of the apse, a strength and contrast of colour which he may have felt would destroy the unity of the interior if carried down the choir and nave. On the other hand, were the plasterer's work in the vaulting relieved with gilding, the effect might be very charming, and without injury to the harmony of the interior. On leaving this subject, I repeat that I feel it a delicate task to criticise what very likely I do not understand in all its bearings; but I am very sure of this: that we as architects do not look upon the work going on in St. Paul's with apathy, but are, on the contrary, keenly alive to its importance, and are most anxious that nothing should be done to destroy the dignity and unity of what is perhaps the grandest Renaissance monument in Christendom.

#### *The Use of Faience.*

The increasing attention paid to the use of faience for internal decoration is a matter of much importance in our unfortunately dirty atmosphere. It enables the architect to insure that his more important apartments shall remain as he designed them. Most of us who have had long experience as practising architects must have been occasionally disconcerted in discovering that some interior which depended greatly on its harmony of colour, and which we may have thought more or less a success when it left our hands, had been handed over when in need of repainting to the tender mercies of some decorator, who,

failing to appreciate the delicate scheme of colour upon which we had prided ourselves, or perhaps wishing to make his speciality more pronounced at the expense of the architecture of the room, had sown discord and vulgarity broadcast over our creation. Now, the use of faience would put a stop to all this. If well applied,—the forms specially designed, the colours, too, carefully studied, and violent contrasts avoided,—faience offers to the architect a new and most interesting field for permanent decoration. It seems almost impossible to be too careful in the juxtaposition of varied tints, as they look, of course, so much more violent in the building than when put side by side in the workshop. As an instance of the successful treatment of a ceiling in this material, I may be permitted to instance that of the Union Discount Company in Cornhill, just completed from the designs of our colleague, Mr. Macvicar Anderson.

#### *Architects not Members of the Institute.*

It is a matter of sincere regret that a few of our most distinguished brother-architects who are not members of our body look upon the Institute with apparent indifference and distrust. That certain names are not to be found among our list of members is a grief to me. I cannot, of course, say that they would confer any benefits upon themselves by joining us, except the benefit that all must derive from united action for a good and worthy object. We of the Institute are bound together by certain ties; but they are only such as make our practice respected by ourselves and by the public. We have no unworthy aims, and we do not want to shackle any man's right of liberty of action. None of the architects whose absence from our body I deplore would dream of doing anything which our by-laws forbid us to do. It is not, therefore, the dread of losing the complete liberty of action we all hold so highly which prevents their joining us. I trust we shall never give up the hope of seeing them within our ranks, never let them feel that their presence here would be anything but most welcome, and an encouragement to us to persevere in our endeavours to make the Institute the worthy upholder of our art. The Institute has already done good work, and we want them among us to enable it to do better. We want the haven of their thoughts, and the help of their personal influence and example. Though they do not at present see their way to give it to us, let us at least ask ourselves what it is on our part to which they take exception. I confess I long to see the time when the Institute shall have so broadened its lines, if they want broadening, that all men who have any pretension to the name of architect, and who are willing to conform to the rules and obligations that are deemed essential to uphold the honour and dignity of our noble profession, will feel it incumbent upon them to join us, and help us to become better artists, more scientific constructors, more thorough men of business. The advancement of our art is not best attained, as it seems to me, by every man working in isolated retirement, and there can be no doubt about it that the occasional sight of each other in meetings such as these is productive of the kindly generous feeling with which we should all regard one another.

The dignity, the greatness of our profession arises from its responsibilities; and in this it differs from all other artistic vocations. The painter has only to please himself in the subject, the inception, and execution of his work. If, when finished, it is thoroughly successful work, in all likelihood it will find a purchaser. The architect, on the other hand, can find nothing to do, can give no satisfactory proof of his capacity until somebody comes to him who is willing to trust him. Consider what that trust is. Not only is he entrusted with the expenditure of large sums of money, but of money expended in such a way as to affect the comfort, the happiness, often the whole tone of the existence, of those who employ him. The client who employs a worthless and incompetent architect not merely throws his money away; he has to endure a far heavier misfortune. He has to live the rest of his days in a house, or worship in a church, or conduct his business in an office or a bank, which he would willingly crase from the face of the earth if he saw his way to such a termination to his disappointment. Put practically his annoyance cannot so be put an end to. If the building he has commissioned be ugly, ill-contrived, and badly executed, so it



must remain,—a constant source of trouble to himself, of derision to his friends and the public. We have, therefore, to show ourselves worthy in every way to be trusted. We have to be sympathetic, putting ourselves, so far as we can, into the circumstances of our clients,—not leading them into unexpected expenditure, not, on the other hand, following their whims if our greater knowledge and experience tell us plainly that such a course will lead to disappointment: for what would be thought of the doctor who suffered his patient to dictate the nature and strength of the remedies to be prescribed? The architect, therefore, has to be not only an artist and a skilled constructor, but he must learn to appreciate the value of other people's money; he must be considerate, honest, patient, firm; and, above all, he must learn in imagination to put himself in the place of his clients, so as to understand their desires. If he were all this, I believe we should hear little of complaint against the profession. I believe we should be respected as we respect ourselves, each other, and our art, which ought to be to us the first consideration, entirely irrespective of material reward.

It is because this Institute is doing all that such a corporate body can do to elevate our profession and to give a higher tone to its practice, that I believe in its continued success. Its advance of late years has been very marked. It has not only grown in numbers, but it has fostered a higher standard of professional probity; and that alone is well worth all the trouble which many have taken in its affairs. Its efforts in the cause of architectural education have been already crowned with success, and we are only now on the threshold of that success; its continued prosperity will depend upon the exertions and the conduct of each of its members. May we all remember this, and do all that in us lies to further the increasing usefulness as well as the corporate interests of the Royal Institute of British Architects.

Professor Kerr rose at the conclusion of the address to propose a vote of thanks to the President. They would all agree, he said, that the address was one which deserved their special thanks for its peculiarly practical tone, going as it did to their hearts as men of business, and as artists and scientific men, in a way which, without any undue comparison, they had seldom experienced. The President occupied so exceedingly dignified a position in the profession, before the eyes of Europe, that every word he had addressed to them would be perused with interest all over the Continent, as well as in this country. At the same time, his discourse had been so peculiarly discursive, that it was quite impossible to make remarks upon it, even with a desire of assisting the good work which the address itself was calculated to effect. It was not the custom in that Institute to criticise the speech of the President, and he hoped it never would be the custom. But even were it customary to criticise the address, he did not know what one could find in it for criticism. He was not one of the school of critics with whom fault-finding was the essence of criticism. And if, on the other hand, he endeavoured to take the opposite course of supporting what had been so well said, it was difficult to see where one could find a subject to which the President had alluded which required support. With regard to the public action of the Institute, he was sure every member would agree that the Institute did not do enough before the public. The President had quoted a haphazard expression of his (the speaker's), which he was quite ready to defend, to the effect that "if Heaven made us Philistines, how can we help it?" He did not mean to say that Heaven had made the Royal Institute of British Architects Philistines. If Philistinism, as they all knew it, was not merely a bad habit, but really an inherent and constitutional taint in the character of the English people, all the greater was the need for those who were selected, who selected themselves, or who selected each other, for the purpose of dealing with this great industrial art, of historical eminence and importance, to do their duty towards the public whom they represented, and to endeavour to improve and ameliorate the Philistinism which was inborn in the land. The Government, unfortunately, was always a particularly Philistine institution. The reason for that it was not the time and place to enter upon, but many of them knew what the reason was, and it was not likely within any reasonable period of time that

the habit of looking at everything as a matter of pounds, shillings, and pence, and nothing else, would be dropped at Whitehall. At the same time, tendency of the public mind, at the present moment, was unquestionably in the direction of improving the artistic feeling of the country. The old-fashioned systems of thought were gradually disappearing. Some of them were old enough to distinctly recollect how very differently every artistic matter was treated a good many years ago. Many of those present, however, were at that happy age that they did not remember those things, and they would scarcely believe him if he were to relate what happened fifty years ago. But those who were young and had to look forward to what he hoped would be a prosperous and happy life would be astonished, perhaps, when they reached old age to find what a difference would have been accomplished between the thoughts of men at the present moment and the thoughts of men then. This country was destined to be a distinctly artistic country. There were evidences of that abroad in all directions. These evidences were distinctly to be seen in other lines than in their own and by themselves, and he believed there were those present who were destined to hold prominent places in the advancement of the new school of art and artistic criticism, which would be a credit to the land in which they lived. He had, therefore, much pleasure in proposing a most cordial vote of thanks to their distinguished President for the discourse to which they had listened with so much pleasure that evening. Mr. W. White, F.S.A., seconded the vote of thanks, which, on being put to the meeting, was carried by acclamation.

The President, in replying, said he hoped from his heart that Professor Kerr's prophecy would be fulfilled.

The proceedings then terminated.

#### THE ART CONGRESS AT BIRMINGHAM:

##### PRESIDENTIAL ADDRESS IN THE SECTION OF ARCHITECTURE.

THE Birmingham Congress of the National Association for the Advancement of Art, and its Application to Industry, commenced on Tuesday, under the Presidency of Mr. J. E. Hodgson, R.A.

On Wednesday, in the Section of Architecture, Mr. T. G. Jackson, M.A., F.S.A., the President of the Section, delivered the following address:

In these days, when more is said and written about art than at any other time in the world's history; when art has become fashionable, which, be it remembered, is a very different thing from becoming popular; when, instead of sitting like Cinderella in the ashes, she walks, as John Bunyan says of fashionable religion, "in her silver slippers"; and when, amid all the loose talk and easy cant which flows so abundantly from the lips of every disciple of culture, artists begin to wonder when society will let them and their craft alone, and instead of talking and theorising about the art of the day, sit down and simply try to enjoy it; it was a happy thought of the Council of this National Art Congress to bind us down to one particular branch of the subject instead of leaving us to range at will over the whole of it.

Our attention this year is directed to education,—artistic education,—and that, it may be assumed, not only of the artists themselves, but of the public at large. In that particular branch of art about which I am asked to address you, we are invited to inquire whether we are going the right way to form good architects; whether anything can be done to teach people generally how to appreciate good architecture and to know it from bad; and, further, how we are to arouse their interest in the subject, so as to make them discontented unless they can surround themselves with architecture really worthy of the name.

That things are not as they should be in either respect may be taken as granted on all sides, for otherwise there would be no sense in our being here to-day to discuss the matter. It is, unhappily, beyond dispute that most people are ignorant of the true canons of architectural taste, and perfectly content with the most deplorable architecture, provided the building be showy and comfortable. A walk through the streets of London or any of our great cities, or even along our country lanes and meadows, is enough to convince us that to

the average Englishman or Englishwoman good architecture and bad are as one. Unless the public taste were satisfied, such architectural horrors as abound on all sides would not be endured. And, again, on the other hand, they would not have been there to offend us unless the majority of architects, so-called, were ignorant of their craft, or, in other words, unless their education were defective and misdirected.

Let us, then, first take the case of the artists, and trace the career of a young man who wishes to become an architect, in order to find out what is wanting in it, and how the present way of training him may be bettered. This education is a matter about which there is no lack of literature, for it has, of late, formed the principal topic of the architectural societies and the theme of leading articles in the architectural papers. One lecturer is at the pains to trace the studies of the young aspirant almost from the cradle, and sees him at his spelling-book and dictation,—we need not go back so far. A theological professor once began a course of lectures with the words, "We will assume the doctrine of the fall of man;" we will take a similar liberty, and assume the student to have had the ordinary education of his class. He now wants the technical teaching necessary to our craft, and to that end, in accordance with the usual practice, he enters an architect's office as an articled pupil or apprentice. There he stays for three years or more, and at the end of his time he is supposed to be able and qualified, and in favourable cases really is so, to undertake such simple work as his friends may have the courage to entrust to him.

Now the good he will have got as a pupil obviously depends on two things,—his own industry and the choice he has made of a master. Pupils sometimes go through their time without learning anything. I remember one case where the pupil of a well-known architect began by tracing drawings, and, being an easy-going youth, devoid of ambition, went on tracing drawings all his time, and left off as ignorant as he began. I remember another case where a young man went into an office where there was little or no work going on, so that, though he had no lack of industry and was anxious to learn, he came away knowing no more than when he went. Such cases of what one can only call gross dishonesty are, I fear, by no means uncommon, and it is unnecessary for me to characterise them further. But in cases where the pupil is eager to learn, and enters an office where there is plenty of work going on of a high character, I can imagine no better way of teaching him how the designing and construction of a building is carried through, and of qualifying him to do it when his own turn comes. He gets there what he could get nowhere else. Draughtsmanship and the principles of building construction may be learned in a science and art school, but there is all the difference in the world between drawing out plans of buildings that will exist only on paper, in which blunders will do no harm, and making drawings which are to be put into the hands of workmen to be really carried out, and which must be right, or else disaster will follow. There is no comparison between the educational value of the two; the difference is as great as that between a review and a battle. It is only in an architect's office that the student can learn how a building is carried out from beginning to end, what drawings and specifications are required to explain the design to workmen, how to meet and overcome unexpected difficulties of arrangement and construction, how to economise materials and labour, and, lastly, what is of no little importance, he there sees something of the professional side of an architect's work, and learns how a business is managed, and work superintended from a distance. Still more important is the opportunity he enjoys of cultivating his taste by seeing good work done, and taking part in the doing of it, if he has chosen wisely and put himself under one who is a master of his craft. Above all, perhaps, when I look back to my own time of pupillage, I should be disposed to rank the benefit of associating with the fellow-students and draughtsmen whom he finds there, among whom debate and criticism run furiously high; opinions are freely expressed, none the less confidently for being immature, artistic reputations are madly exalted to heroic heights or ruthlessly pulled down to unmerited degradation, and designs of all but the idol of the hour are mercilessly



picked to pieces, those of the master himself by no means escaping unscathed. In the keen fire of these ardent little societies the pupil finds the same opportunity of shaping, tempering, and sharpening his views of art which exists in the larger societies of a foreign atelier; but he has the inestimable advantage, on which I have already touched, that he is engaged on real work and not on paper exercises.

But highly as I am disposed to rate this system of apprenticeship, which is, in fact, the way in which all the sculptors, architects, and painters of the past learned their crafts in the palmy days of art, it is clear that the pupil will not find in it all that he wants. He will see in his master's office only the kind of work that happens to be going on, and will have to supplement it by private study. He must read books on construction, drainage, and what, for want of a sensible name, is called sanitation, ventilation, heating, and other practical building works, which are not architecture, but nevertheless underlie all architecture, and for which, if they are neglected, no architectural excellence will compensate. That an architect must be master of these practical matters goes without saying. They are elements of good building, and good building must precede good architecture, and form the foundation of it; for history teaches us that it was by honestly meeting the necessities and suggestions of building construction that the different styles of architecture in the past were shaped into what we see them, and there is no doubt that if any new style should arise in the future it will owe its existence, and its peculiar character, to a similar reason.

But to these practical studies the architect must add that which is to make him an artist, and to that end he has to take into consideration not only the current art of the day, but that of the past. Art under its present conditions has its literary and historical side, and he will have to study this independently of the work of the office, by reading and by visiting ancient buildings. Sketching must always form a principal part of an architect's education; and living, as we do, in an age with no vernacular style of its own, we naturally look to the work of former ages, which were happier in this respect. It is generally, and rightly, thought essential that the student should travel widely and sketch largely from old buildings, measuring and studying them in detail, and so forming his taste and adding to his resources. The great builders of bygone times are still our masters; we are bound to acquaint ourselves to a greater or less extent with all the styles of the past, and, as I think, for purposes of practical utility, to study in particular those of mediæval and modern Europe which are nearest to us historically, ethnically, and socially, and which, therefore, most concern us. Above all, as Englishmen, it must be ours to know best the native styles of our own country, styles that will safely bear comparison with those of any other land, and in which, if anywhere, lies dormant the germ of that future living national architecture which is so long in coming to the birth.

But sketching has its snares and pit-falls. In his anxiety to acquire a happy touch with the pencil or brush, and to fill as many sketch-books as his companions, the student will often forget the reason why he should sketch at all, and will make the production of drawings his object instead of the knowledge of his craft to which they should be instrumental. His business should be to study a beautiful building when he finds it, by analysing it carefully, dissecting it, and finding out why it pleases him. This means a good deal more than simply sitting down and sketching it. I do not say he should not sketch pictorially as well; on the contrary, I would have every architect able to produce sketches that would not only be useful as records of facts, but also beautiful as drawings. But remember this, that making pretty drawings will never teach you to be an architect; so far as that is concerned you may as well burn them as fast as you do them. In after days when, in want of an idea, one turns over a sketch-book or portfolio of finished drawings, how rarely does one get a suggestion to help one out of one's difficulty? It is from the brief analytical notes made never to meet the eye of another, rough dimensions of proportions, of mass, of the scale of details, and memoranda of modes of construction that one gets the hint one wants. Only let whatever you draw, however slight, be drawn well and truly; let it be right as far as it goes, and

artistically expressed within its own limits. And yet after all the great value of sketching is not the sketch but the doing it. Its main use is educational. It is by drawing beautiful things, or parts of them, that one learns to understand them. So studied, they are never forgotten, and though the sketches may be thrown aside and never looked at again, which will in most cases be their fate, their good remains behind stored in the treasure-house of the memory.

And now to turn from artistic or freehand drawing to mechanical drawing, which forms so large a part of an architect's work that many seem to think it begins and ends there. Neat geometrical draughtsmanship up to a certain point has its use, but very often a great deal too much stress is laid upon it. It is easily acquired, being purely a mechanical art; and as it makes no demand on the artistic sense, any dillard can excel in it. The highly-finished look of elaborate geometrical drawings takes in the vulgar, with whom they pass muster as beautiful works of art. But what is the real beautiful,—that is nothing to the point; they are merely diagrams made for use, in order to explain to workmen and others how things are to be made. They have no other use or object than that. It is clear they can have no artistic value, because they are absolutely unnatural. Regarded as true pictures of what they stand for they are barbarous and absurd; whatever else the future building will look like, we know that it will not look like that. As drawings they have no value, and cannot fairly be criticised at all from that point of view. They have but one standard of merit—that of accuracy. They need not, and should not, be slovenly; but, so long as they are accurate and clear, and, above all, intelligible, so that the workman may be able to follow them without blundering, that is all that should be expected of them, and any further elaboration is perfectly idle and absurd. It is appalling to think of the labour thrown away in our offices in smartening up plans and elevations. An immense amount of mischief is done in art schools throughout the country by encouraging students to think that highly-finished and shaded geometrical drawing is an accomplishment worth years of study, and by making proficiency in the manufacture of such drawings the ground on which the national prizes in the Department of Science and Art are awarded. The architectural drawings sent up to South Kensington from the various art schools throughout the land, and still more those produced by architectural students in France and Austria and other Continental countries, where this sort of finish is valued even more highly than with us, are often miracles of misdirected dexterity; the elevations are elaborately shaded, the columns carefully rounded, cast shadows are logically projected at an angle of 45 degrees, breaking correctly round every projection, reflected lights are carefully observed, and all the tricks of mechanical draughtsmanship exhausted, while the only thing forgotten is the architecture itself, all this labour being frequently bestowed on a design which is beneath contempt. The worst of it is that the student learns to think these geometrical exercises, which, as I have said, must from their very nature be mere mechanical performances, are really works of art, and that by learning to produce them he is really learning architecture. If the schools of art think that by training lads in this way they are qualifying them to be useful assistants in an architect's office, it is high time they were undeceived. A lad would be of far more use to us who had spent his time in learning building construction, and had been taught that the only use of geometrical drawing is to explain the construction of a building to the workmen, so that they may measure it with rule and compass, and cut their stone and wood and lay their bricks accordingly. Let the pupils be reminded that, as no one will build the shadows they so ingeniously project, there is no use in projecting them. Let them be told "the mason will not make his columns any the rounder because you stipple them up with light shade, dark shade, and reflected light; and one sectional line drawn across your elevation will be of more service to the workman than all the shading in the world, and for that reason will be more proper, however much in vulgar estimation it might be thought to disfigure your drawing." After all, it is the public who are to blame for the false value attached to this kind

of drawing: architects would not get up their drawings with this expensive and unnecessary elaboration unless they found that, with most unprofessional critics, the execution of the drawings carried more weight than the merit of the design; and it is quite certain that in a competition, no design, however good, would have a chance of success unless the drawings were finished with all the tricks of the mechanical draughtsman, far beyond what was necessary to make the design intelligible.

Let us, then, suppose the would-be architect to have acquired a fair knowledge of practical construction, and of the mode of making drawings for workmen to work from, and also some skill in freehand drawing, so as to be able to sketch with facility, and express his ideas readily on paper, both for his own use, and to convey his meaning to others. He has, we will suppose, done a great many sketches of old buildings, and acquainted himself tolerably well with the history of architecture, and the succession of styles. Is he now furnished for his flight, and ready to take wing as a full-fledged architect? So, no doubt, many people would think, and unhappily this is, often enough, all the education he gets. But to those who understand what architecture has been, and may be again if proper measures are taken, this will seem but the beginning of a real art education,—the mere familiarising oneself with the tools with which the real work is to be done. Of all arts, architecture is the most practical; it can never be mastered from books and drawings. The lore thus stored up must be digested and assimilated, or it will never nourish our artistic nature. Our knowledge of ancient styles will result in mere antiquarianism, unless we apply it to the conditions of modern life. As artists, our business is not to study, but to create; not to admire and reproduce the work of other days, but to produce work of our own for others to admire and profit by in their turn. We shall never do this by sitting at our drawing tables and scattering our designs thence among the workmen through the penny post. An architect's work is the direction of a variety of handicrafts, to none of which he has himself been trained. All the more necessary, therefore, is it for him to know enough about them to be able, in the first place, to design his work so that it can be made at all; and next, so that it can be made without needless trouble and expense. This knowledge he can only acquire in the workshop, and on the building; books will never teach it; and the student cannot begin too soon to frequent the masons' sheds and the carpenters' shops. I would have every young man during his pupillage, or at the end of it, pass a few months under a clerk of works at some building, best of all on one for which he has been making drawings in the office, so that he may see how his work on paper looks when realised in stone or wood. This is an education that never ends; as necessary for the architect as for the pupil; for it is by watching our own work, and that of our brother artists, that we learn how to improve our style; and so, if we are good for anything at all, we go on learning something fresh, and gaining fresh power of design to our dying day.

It is in this *rapprochement* of architecture to the handicrafts,—of the architect to the craftsman,—that I see the only opening by which we are likely to make any sensible progress. The need of it is the more obvious when we consider the extent of what an architect is now required to do. Happily, the day has gone by when his work was supposed to begin and end with the bricklaying, the carpentry, and the drains. No architect who respects himself and pretends to the character of an artist, will now resign the decoration of his building to other hands. Architecture pure and simple, robbed of her attributes, is not enough to satisfy him; he will never be content to let others finish what he has roughed out; he will conceive his building as a whole, harmonious and consistent in all its parts, in the smallest details as well as in the general mass; and we have only to turn to experience to see that this is the right view for him to take. The only modern buildings which command the respect of competent judges are those that have been carried out on this principle. Whatever may have been the case in former days, there is now, under the present condition of art, no other road to excellence. When every man works in a way of his own, and there is no such thing as a vernacular style in which every artist naturally expresses himself, the architect is the only element of unity in the building; and



unless his handiwork can be traced throughout it will be no better than a museum of odds and ends, and a collection of jarring discords. The architect of to-day, therefore, is expected to be able to design everything, from the building itself down to its furniture, and to work in all kinds of materials, from marble to stone, from stone to wood, and from wood to iron. He must understand colour as well as form, and be able to design not only the carving on his walls, but the needlework of the hangings, the wrought-ironwork of the gates and screens and railings, and all the metalwork down to the hinges, locks, handles, and finger-plates of his doors. But in order to design successfully in so many handicrafts, it is necessary that he should understand the technical difficulties and the possibilities of everyone of them. If he fails to do this, his design will either result in complete failure, or in unnecessary and extravagant expense; he will either set the workmen to do impossibilities, or, at the best, waste their labour by giving them difficulties to get over which anyone who understood the technique of the craft in question would never have put in their way. Let me, by way of illustration, give you a blunder of my own. I had designed a rather delicate ironwork grille, with interlacing rods threaded through one another in a way well-known in old German and Italian examples. To make this, the smith has to weld some of the rods at short distances between the eyes through which they are threaded, also to open some of the eyes and weld, or "shut," them down again. This grille was made successfully. Some time after, when designing another piece of ironwork in which the same feature of interlacing rods occurred, I thought the effect would be better if the mesh of the interlaced part were smaller, and therefore reduced each square opening about  $\frac{1}{2}$  in. After the smith had had the work in his hands a little time, it occurred to me to go and watch him at work in order to see exactly how he did it, and then I found that this  $\frac{1}{2}$  in. reduction had simply made a possible task impossible, by leaving him no room to make his weld, so that only about half the eyes could be welded, and the rest had to be merely closed down. Now, the British workman never likes to be beaten, and if you give him an impossibility he will manage to get over it somehow or other, and very likely you will never hear anything about it. But this makes it no better—it should be the architect's business to design in such a way that no unnecessary difficulties occur, and that everything may be done by the natural and usual processes of the craft in question; and this he can only do by mastering the technical methods of work in each instance, by seeing the thing made, and consulting the workpeople who have to make it.

There is another way in which closer contact with the handicrafts and handicraftsmen will be of use to the architect; nothing perhaps will do more to cure him of that tendency to antiquarianism, which is one of our besetting sins. The care and repair of ancient buildings, the study of the vast literature of which they form the subject, the habit of looking to them for examples of style, and taking them for our models, and the amount of antiquarian knowledge which is indispensable to us in the exercise of our calling, all tend to blind us to the real use of ancient example, and to make us think that our goal is the revival of ancient architecture, and not that of architecture itself. No mistake can be more fatal to the progress of art than this. Without denying the beauty of some of the best modern work which professedly imitates, and indeed imitates only too well, the work of the Middle Ages, it is, I think, evident that it is unfruitful and can lead to nothing further. Old work should be studied, not because it is old, but because it is good. The glamour of historic association must be ignored, and ancient architecture should be analysed and criticised as freely as if it were modern, and nothing will do more to encourage this modern way of looking at art than familiarity with actual handicraft. It is in seeing a thing done, or, better still, doing it oneself, that new ways of doing it suggest themselves, and so a step onward is gained. It is in the workshop that the art-student, be he architect or what else, will find the readiest stimulus to his fancy and the best antidote for a slavish adherence to precedent. It is essential that he should be able to handle the modelling clay, if he wishes to get his carving done to his mind; and if he could wield the hammer and forge an iron scroll, so

much the better. I can testify from personal experience that something may be learned even by so humble an exercise as building a brick wall. The day has gone by when architecture was believed to be produced with compasses and T-square. The cry of the day among artists, and the theme of most of the speakers at the two preceding National Art Congresses, is the solidarity of art, the kinship of architecture, painting, and sculpture, as three modes of saying the same thing, three vehicles of artistic expression that ought never to have been forced asunder, and cannot thrive apart. It is the healthiest sign of the day that this intercommunion of the arts and artists is gaining ground, and that the number of men is increasing who can design not only the building but also its decoration, and not only the decoration, but also the building itself. Let the architectural student lose no chance of associating himself with art students of all kinds, not only his fellow-architects, for discussion and interchange of ideas. Why should not a large town like Birmingham have something like the Art Workers' Guild in London, a club of artists of every kind, painters, sculptors, architects, painters on glass, furniture-makers, bookbinders, engravers, and half-a-dozen other varieties, who meet together once a fortnight to hear papers on each craft in turn from its own craftsmen, accompanied, when possible, by practical demonstrations, and followed by a general discussion in which men of all branches of art freely engage? And why should not the industries of Birmingham result in a local exhibition like that of the Arts and Crafts now open in London, when artists of all kinds meet on the common ground of design, and when the individuality of the craftsman is not hidden behind the name of the firm that employs him? This, then, is the education by which I would have our young architects trained for their work; not one that begins and ends on the office stool on which he perches as a pupil, and with mastering the principles of construction as explained in books and drawings, but one supplemented by reading, by sketching, by thinking, by following his work into the workshop or to the building, by constant communion with other artists, and last, though not least, by learning to model, and above all to draw the figure from casts and from life, as the root and key of all decorative design and the centre of all art education.\*

#### COMPETITIONS.

**THE PROPOSED BATTERSEA POLYTECHNIC.**—The Committee of the South London Polytechnic Institutes have, with the advice and assistance of their Consulting Architect, Mr. Rowland Plimbe, F.R.I.B.A., just selected six sets of drawings from the fifteen sent them in the preliminary competition for a design for the proposed Battersea Polytechnic. The authors of the six selected designs have been invited to take part in a final competition in which the drawings will be made to an enlarged scale, viz.,  $\frac{1}{4}$  in. scale to a foot in lieu of  $\frac{1}{8}$  in. to a foot scale in the preliminary competition. The six successful competitors are Mr. John Belcher, F.R.I.B.A., Messrs. Henman & Harrison, Mr. E. W. Mountford, Messrs. Roger Smith, Son, & Gale, Mr. J. Osborne Smith, and Mr. Sidney R. Smith. The proposed Polytechnic is to cost a sum of 40,000*l.*, and will be erected on a site of about two acres facing the Battersea Park-road. In order to complete the committee's scheme, and fit up the Institute when built, a sum of nearly 10,000*l.* is still required. The date for sending in drawings in the final competition is (as at present fixed) January 21 next.

**PUBLIC BATHS AT CAMBERWELL.**—We hear that the professional referee in this competition, Mr. Charles Barry, F.S.A., has recommended the design of Messrs. Spalding & Cross for the public baths on the Camberwell-green site, and that it has been adopted by the Camberwell Baths Commissioners. The estimated cost of the building is about 24,000*l.*

**WESLEYAN CHAPEL AND SUNDAY SCHOOL, MILLER, NEAR BLACKBURN.**—We are informed that in a limited competition for the above chapel and school, the design of Mr. Walter Barrow, of Preston, has been accepted.

\* We will print the remainder of Mr. Jackson's address, and other proceedings of the Congress, in our next. Another paper read before the Architectural Section of the Congress, by Mr. H. H. Statham, appears on pp. 367-69.

#### Illustrations.

##### THE NEW "DRESDENER BANK" BUILDING, BERLIN.

**T**HE new building of the "Dresdener Bank," situated most advantageously on a corner site, with main front looking on to the Opera Place, has been erected for the purpose of furnishing ample and dignified office room for carrying on the lately much enlarged business, in which a staff of upwards of 300 persons is employed.

The new building as it now stands has a ground floor and a first floor devoted entirely to public despatch business, offices, and board; a basement, in which the strong rooms and the vaults of the "safe deposit" are situated; and a second floor, containing some of the head officials' residences, each part independent in itself. The main feature of the interior is a central hall, on three sides of which the counters of the general cashier, the security and coupon departments, have been placed, these being backed by their respective offices, and at the same time being in close connexion with the Stock Exchange department on the one side and with the otherwise quite independent exchange-office and deposit department on the other. On the first floor, looking towards the front, easily attainable by main and side staircases, have been placed the board-room, together with the reception-rooms, and private offices of the managers; and in close connexion with this administrative department, situated on the same floor, extensive accommodation for the secretaries, corresponding clerks, and book-keepers has been planned. The strong room of the bank proper, having its position in the basement below the central hall, is constructed entirely of steel plates, and resembles an enormous double box, the room between the sides of which is used as a patrol way for the night watchmen; it is so placed that it can only be entered after passing through the security vaults, situated on the same level, and these again only by means of a special staircase from the security department.

The façades are of a Saxon freestone with a Bavarian granite base, and the style of design is a very typical example of the modern Berlin architecture; monumental but somewhat cold and formal. The frieze, showing the motif "work," from the ideal as well as practical point of view, and the central sculpture illustrating "The Justice of Fortune," were executed by Herr Geiger. The architect is Herr L. Heim.

##### DESIGN FOR COMPLETION OF HOLY TRINITY CHURCH, CORK.

This design for a tower to Holy Trinity Church, Cork, was submitted in competition by Mr. Thos. Dwyer, of the Royal Hibernian Academy, the object of the competition being a memorial to Father Mathew.

The design was unsuccessful in the competition, but we are glad to publish it as the work of a well-known and talented architect of the sister island (if one is still to be allowed to call Ireland so).

##### DECORATION FOR A RECEPTION-ROOM.

This design was made along with others for the decoration of a house in Buenos Ayres, and has been carried out in rosewood inlaid with box, with silk panels above and a painted frieze. The artist is Mr. Roland Hill, of London.

##### NORWICH CATHEDRAL: INTERIOR VIEW FROM THE NORTH TRANSEPT.

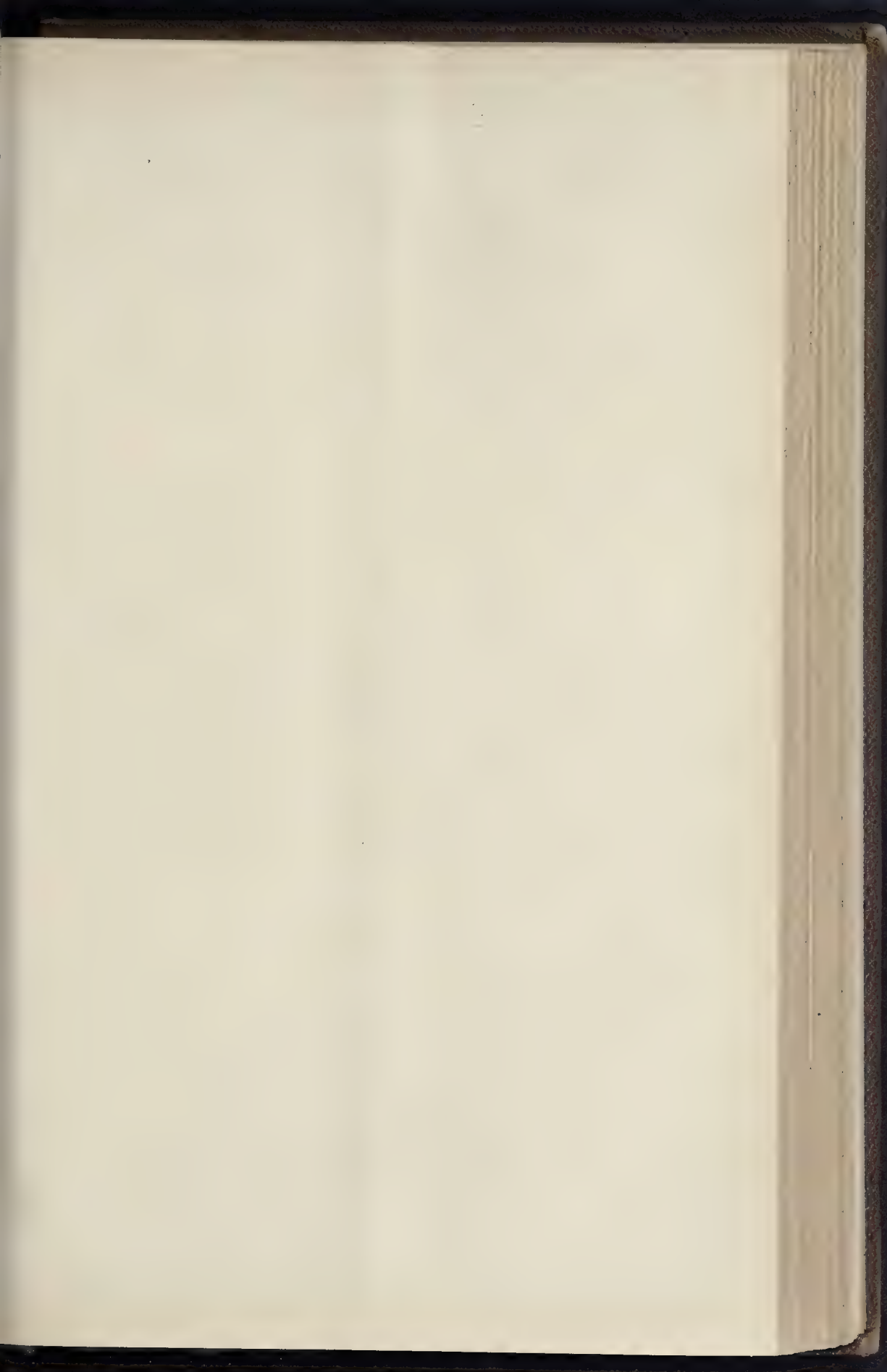
This is a view taken nearly under the north arch of the crossing at Norwich, showing one of the transitional piers and the triforium arcade beyond, with the late clearstory and vaulting above.

The original drawing, by Mr. A. D. Smith, was exhibited in the Royal Academy this year.

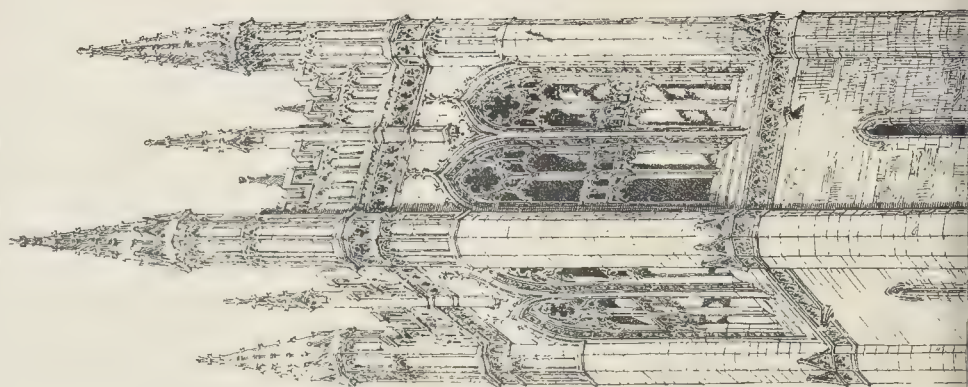
##### TUTWOOD LODGE, CATERHAM, SURREY.

A small residence formerly occupied there, and this has been incorporated in the new building, but the old structure is not left visible externally. The walls are of red brick, with half-timbered work for the upper stories, and the roof is covered with Broseley tiles.

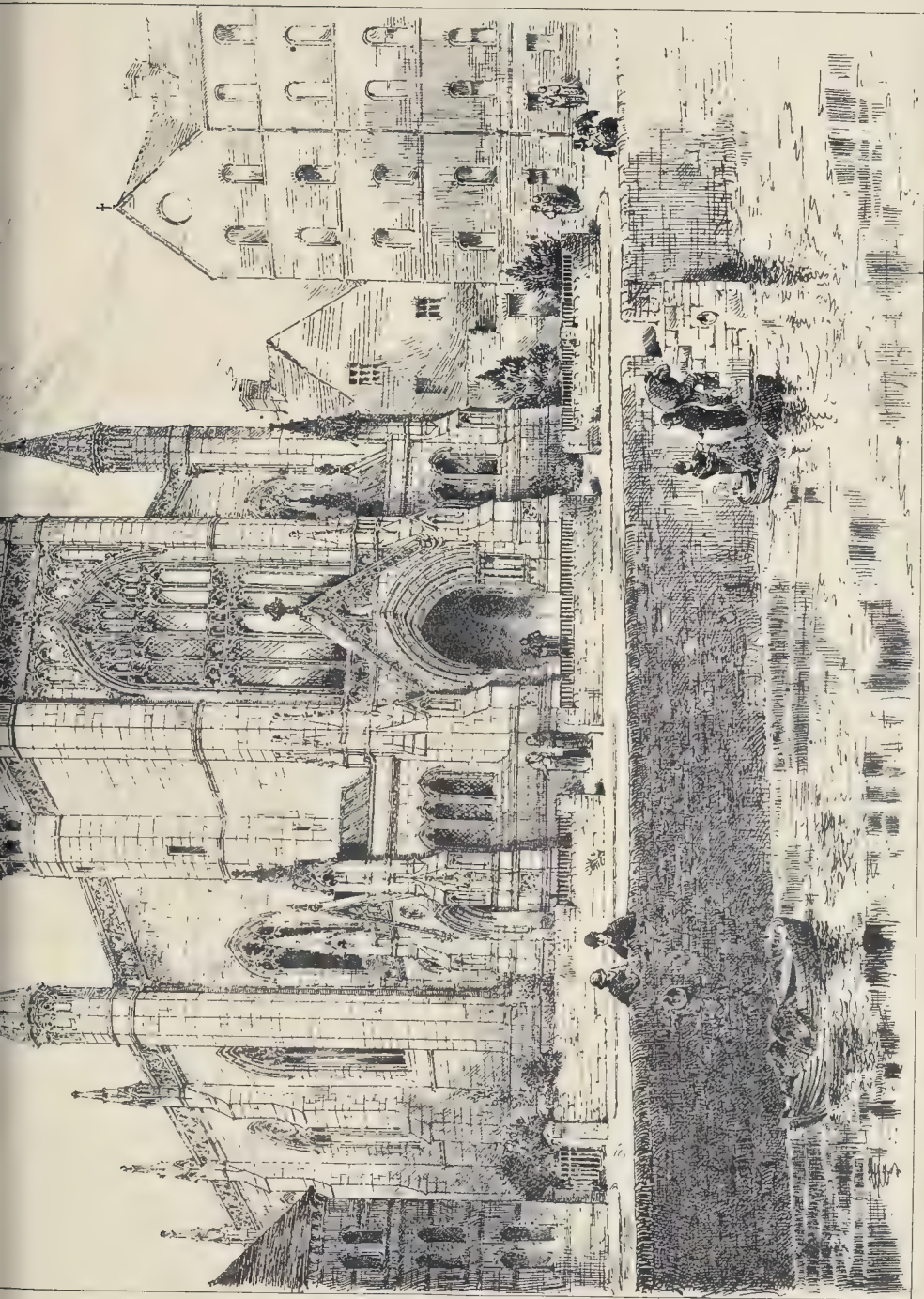




THE BUILDER, NOVEMBER 8, 1890



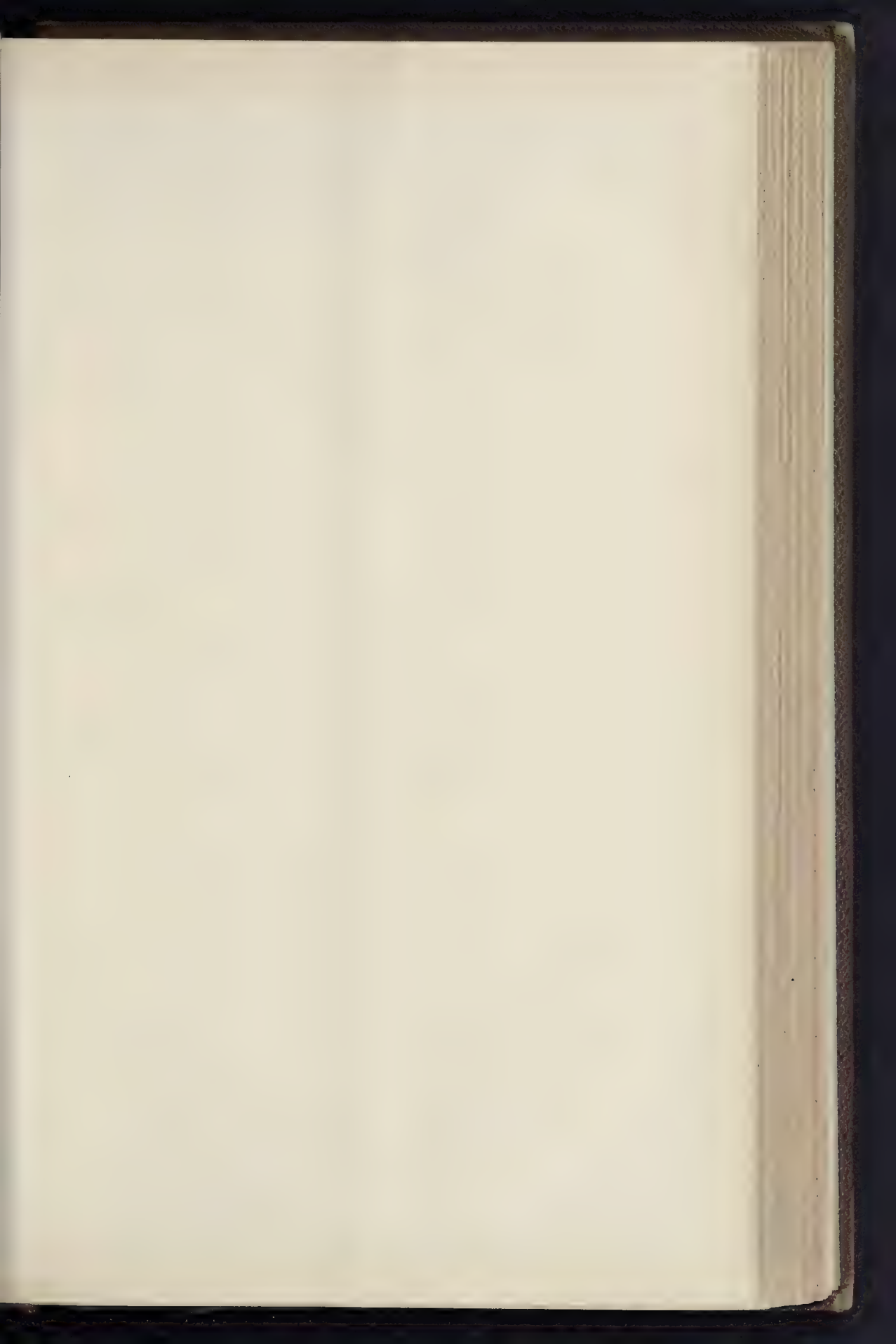


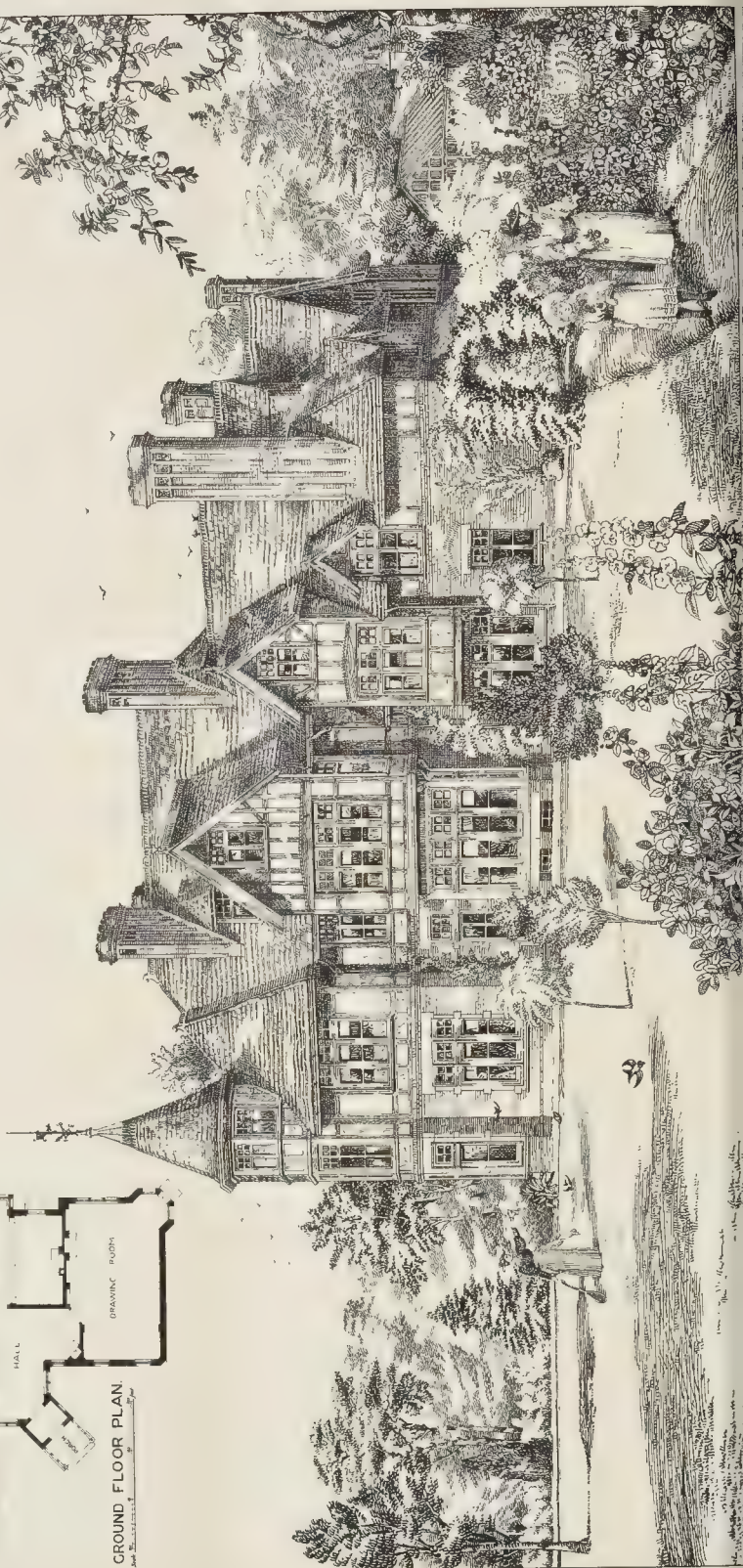
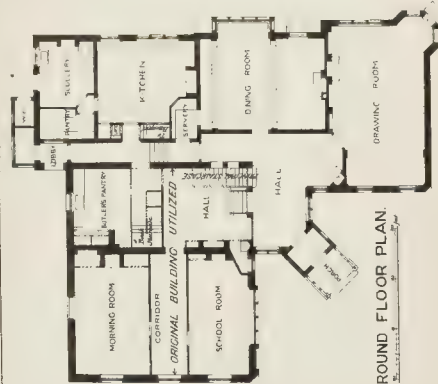


COMPETITION DESIGN FOR COMPLETION OF HOLY TRINITY CHURCH, CORK. BY MR. THOS. DREW, F.R.I.B.A.

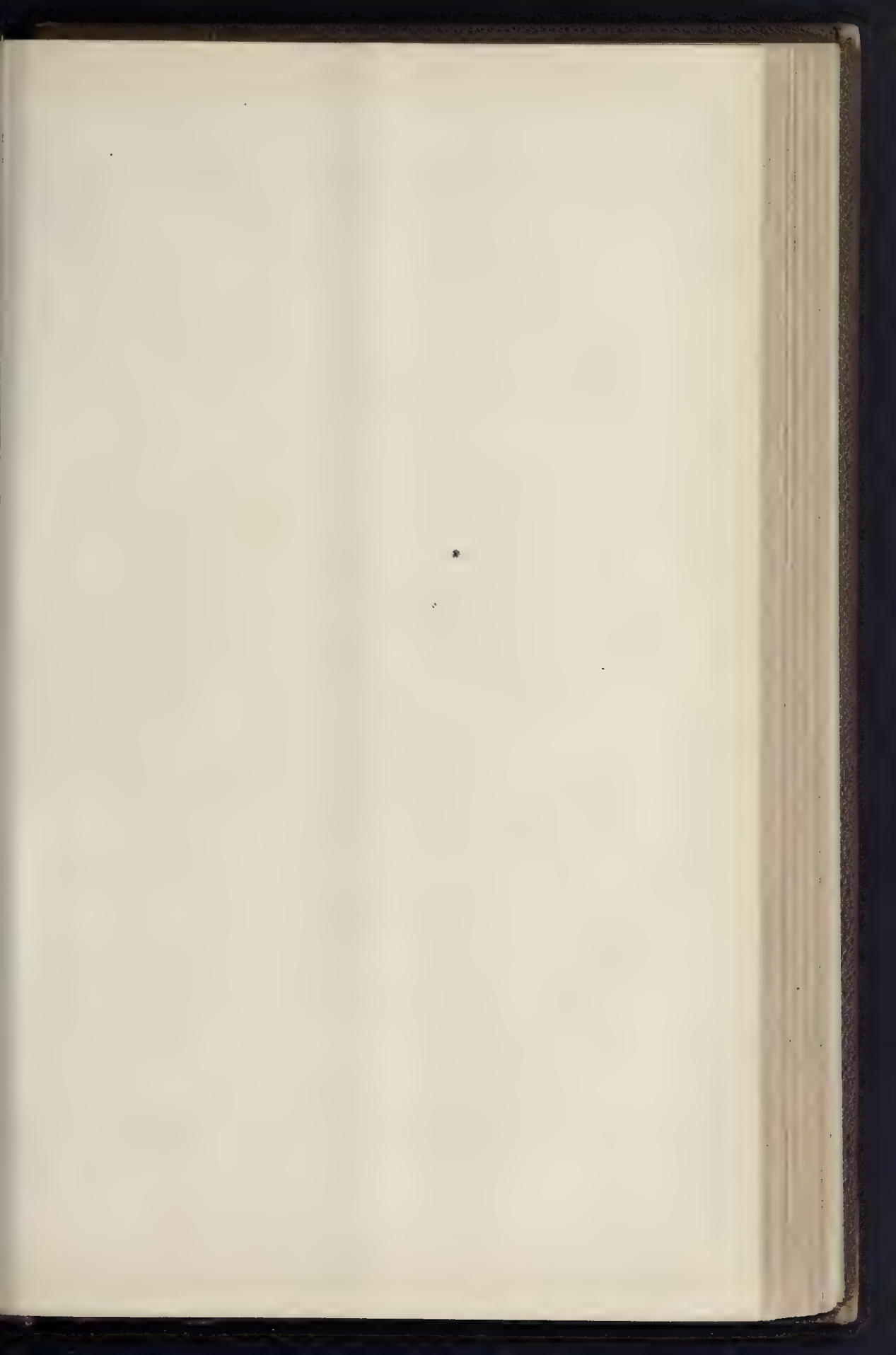












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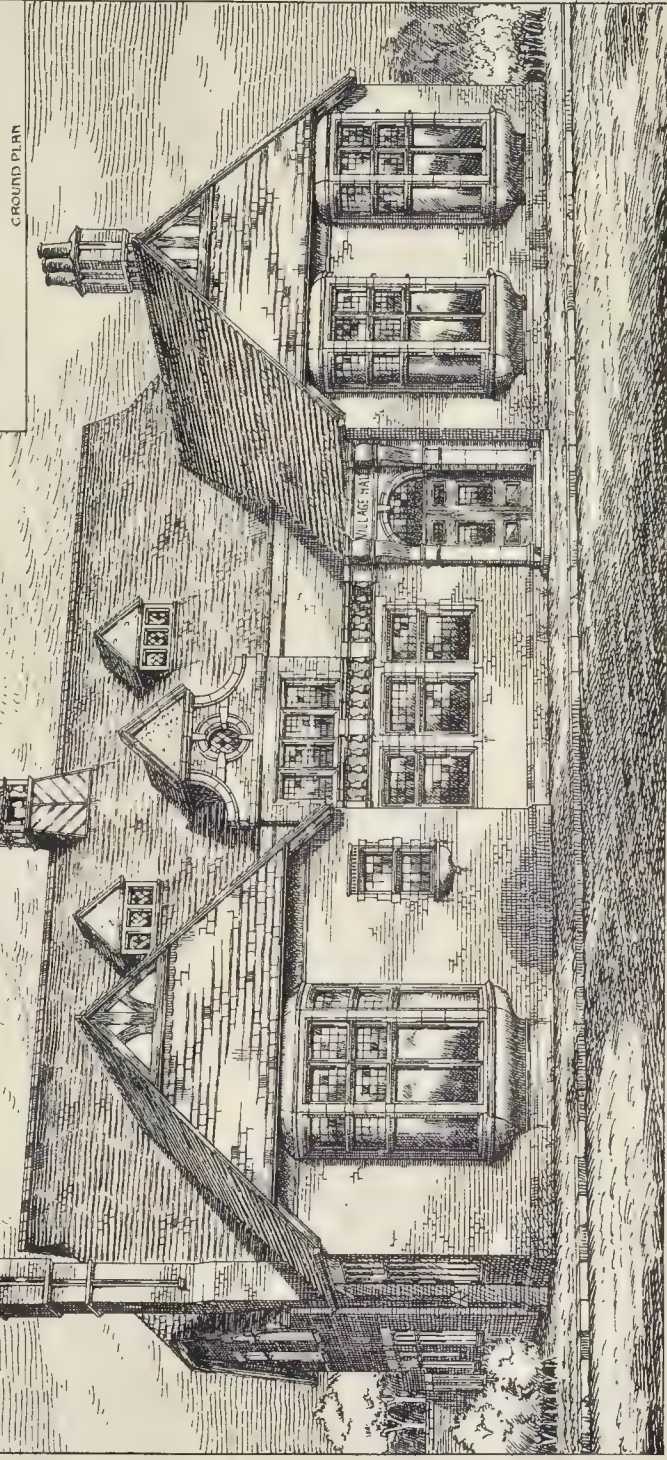
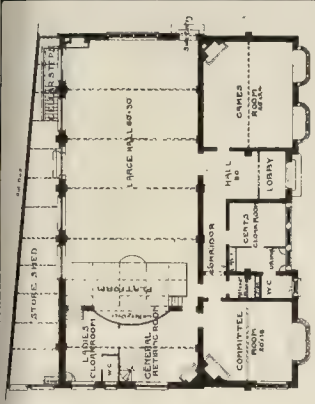




VIEW IN NORWICH CATHEDRAL, FROM NORTH TRANSEPT.—FROM A DRAWING BY MR. A. D. SMITH.





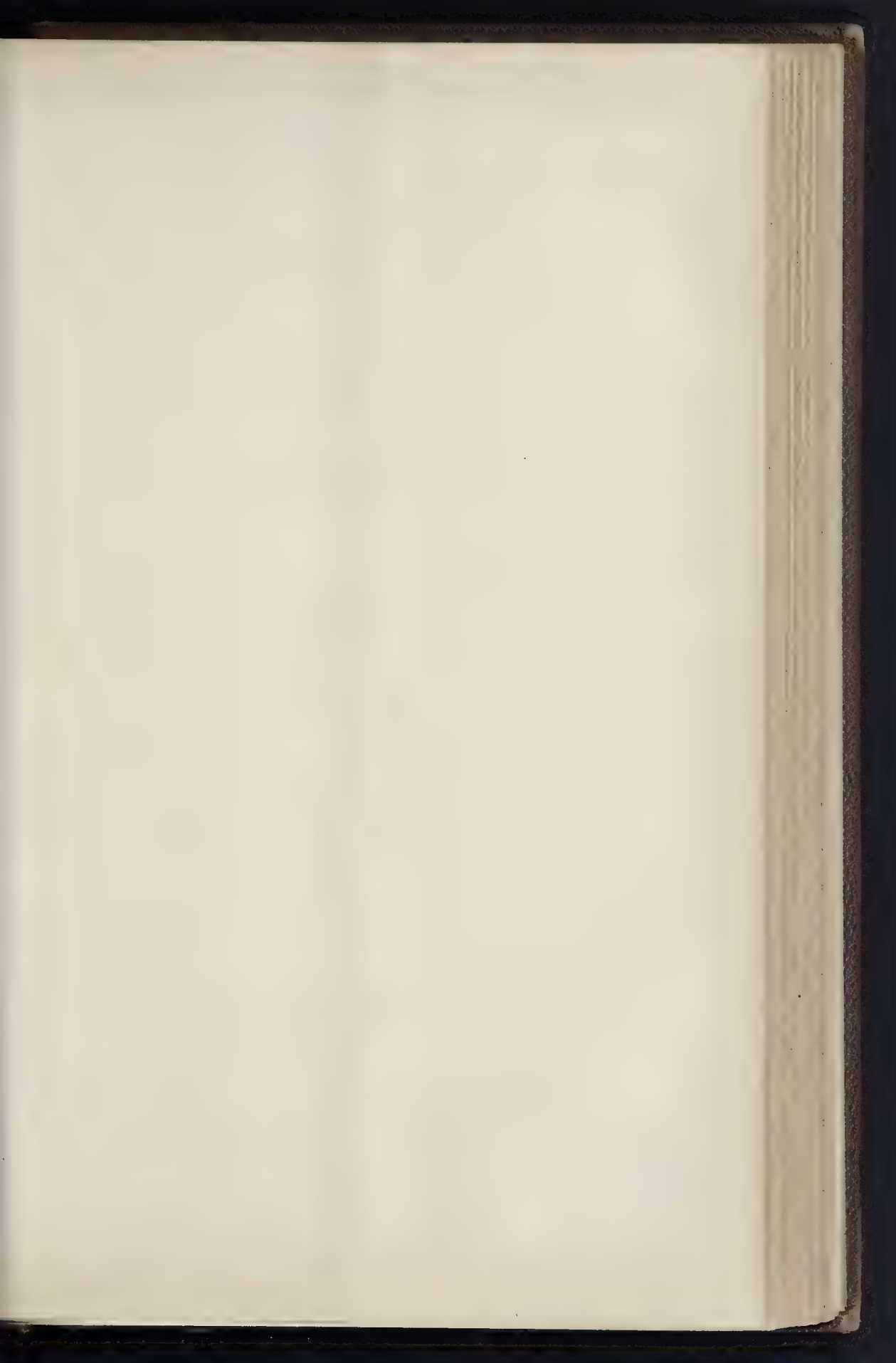


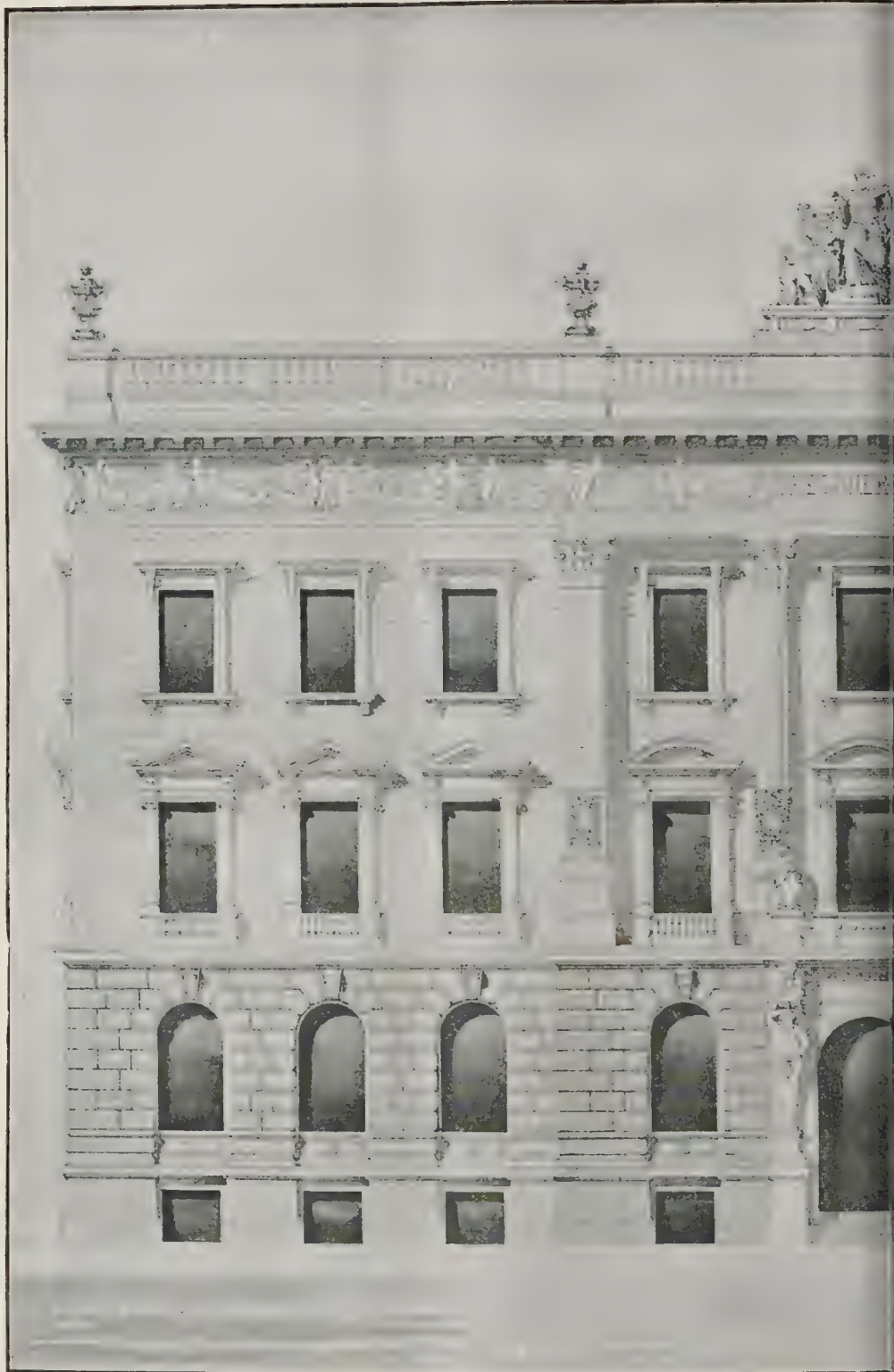
VILLAGE HALL, ORPINGTON, KENT. MR. G. ST. PIERRE HARRIS, A.R.I.B.A., ARCHT.

PHOTOGRAPH BY MR. J. H. HARRIS, A.R.I.B.A., ARCHT.

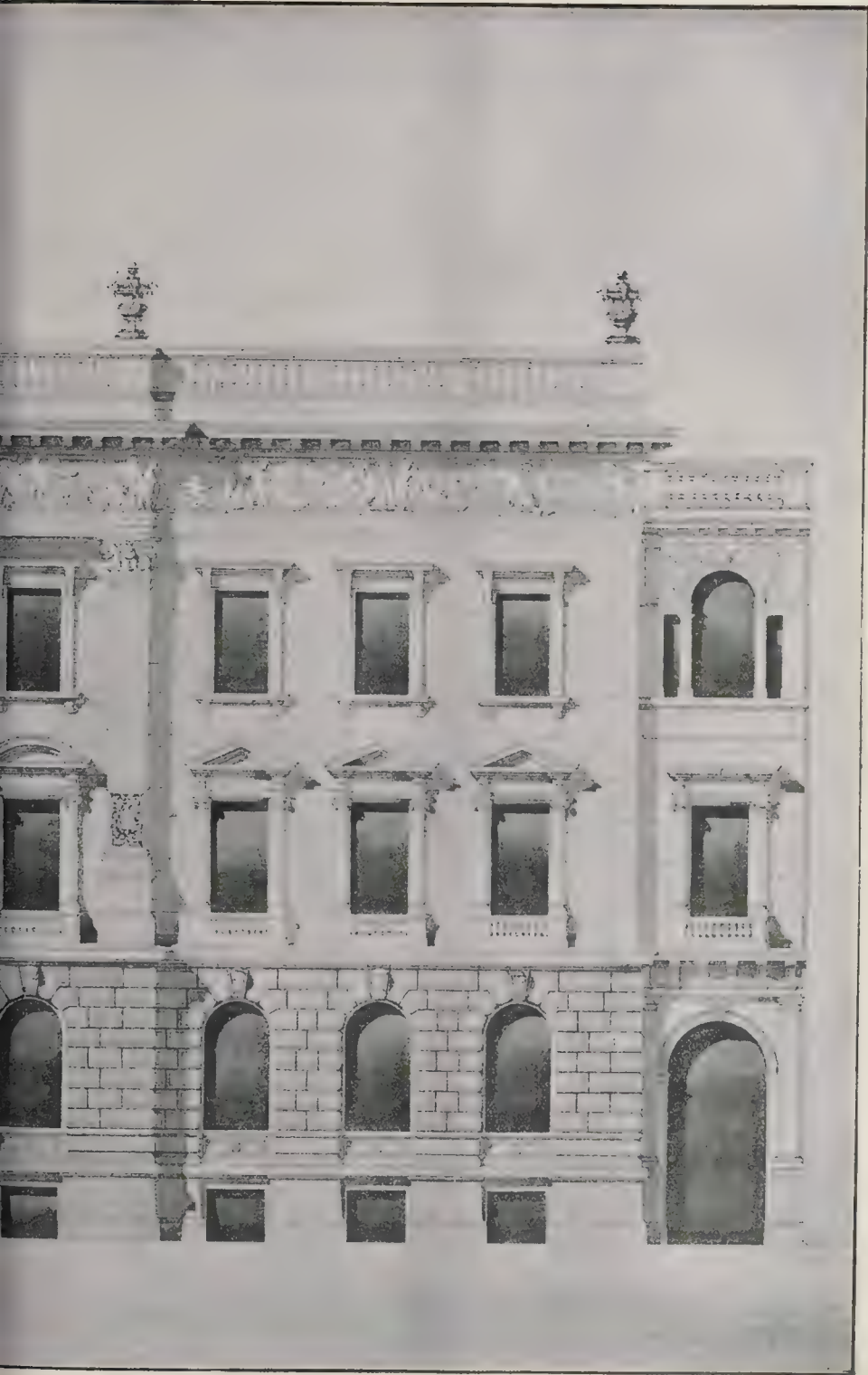












ERR L. HEIM, ARCHITECT.





The new part of the ground floor consists of entrance-hall, drawing-room, dining-room, with oak panelling to the walls and ceiling; kitchen and offices. The older part of the ground floor is utilised for morning-room, school-room, pantry, &c. Cellarage is provided under part of the new rooms.

The first floor contains a library fitted with walnut paneling and book-cases. Upon the floor over, but communicating with the library by a separate staircase, is a book-room for pamphlets, also a smoking-room in the turret.

Eleven bedrooms, besides dressing-room, bath room, &c., complete the remainder of the accommodation provided upon the first and second floors, a few of these rooms being in the older part of the building.

The halls, corridors, staircase, and some of the rooms, are warmed by hot-water radiators. Marlborough stoves have been adopted throughout. The house is fitted with electric bells, peaking tubes, and a service lift.

The grounds have been laid out by Mr. Paul, of Cheshunt.

The builder is Mr. John Greenwood, and the total cost has been about 6,000*l*. Mr. Alfred Under, F.R.I.B.A., is the architect.

#### THE VILLAGE HALL, ORPINGTON, KENT.

This building has been recently erected in a central position in the village of Orpington, at the sole cost, together with the furniture and fittings, of Mr. Alfred Brown, of Pine Ridge, Orpington, for the use of the parishioners, irrespective of creed or politics.

The plans, &c., were prepared by Mr. St. Pierre Harris, A.R.I.B.A., architect, and the works have been carried out under his supervision, by Messrs. W. Holt & Son, builders, of Troydon. The building was opened by Sir John Lubbock on October 22.

Externally, the walls are faced with red bricks from Woolpit, the window dressings, alustrade, porch, &c., being of buff terra-cotta, with a slight tinge of pink. The front gables are weather-tiled, relieved by a sparing use of half-timber work, the roof (which is surmounted by a flèche in English oak, and covered with copper) is of strawberry-coloured Broseley stone. The architect's aim has been to provide a building suitable to modern requirements, of substantial character, and designed to harmonise as much as possible with its old-fashioned surroundings.

The plan in the corner of the plate shows the general arrangement. The hall is covered by a hammer-beam roof, and that and the Club Rooms' ceilings have ornamental friezes of fibrous plaster. At one end of the hall is a moveable platform with an arched recess at the back and a minstrel gallery over. The rooms are at present not permanently decorated, but an agreeable colour effect has been obtained by the use of plain tints, in which work the architect has been assisted by Mr. Lewis F. Day.

Messrs. Doulton & Co. supplied the terrazzo and the sanitary fittings; Messrs. Mainzer & Kempthorne, the mosaic paving; Messrs. Brode & Co., the wrought-iron gas-fittings, rather-vane, &c.; Messrs. Worrall & Co., of Liverpool, the wrought-iron fences and balustrades; Messrs. Mortelmans & Co., of Camberwell, the fibrous plaster; Messrs. Weekes & Co., the heating apparatus; Messrs. Kelley & Co., the leaded cathedral glazing; Messrs. Markes Bros., the stoves and mantels, which are supplied with fresh-air inlets into the rooms; Messrs. Boyle, Limited, the fresh-air jets; Messrs. Hart, Son, and Peard, the locks and fittings.

THE ENGLISH IRON TRADE.—There is an improvement in the English iron market, which shows itself in a larger volume of business and firmer prices, a matter of fact, the better tone is perceptible in the northern markets, but it cannot fall far long to influence those of the south. In pig-iron the buying is still only for immediate requirements, but more money has to be paid. The Glasgow warrant market has again been in a rising tendency, and the business done has aggregated a large total. There is a fair demand for makers' iron, and some brands are being quoted again. Liddesbrough pig has advanced 6*d*. per ton, and Bessemer iron, 2*s*. There is a fair movement in finished bar, and values are steady. Steel has been less stiff, but of a somewhat slack demand, temporarily. The shipbuilding trade is in satisfactory condition. Engineers keep well employed.—*Iron*.

#### ANCIENT BUILDINGS AND MODERN ARCHITECTS.\*

BOTH in relation to the use to be made of the architectural art of the past, and the scope to be given to the architectural art of the present, it seems desirable that some attempt should be made at a dispassionate consideration of the relation of the modern architect and his work to the claims of ancient monuments, on occasions when the work of the ancient and of the modern architect comes unavoidably into juxtaposition or into absolute competition.

Every one is aware that, with the Gothic revival movement half a century ago, there arose not only a passion for making modern imitations of Medieval work, but for restoring, as it was called, such Medieval monuments as had suffered from time, or from wreckage, or wilful injury of one kind or another; though perhaps every one is not alive to the fact that, at that time and up to twenty years ago, the whole feeling of the best educated and most art-loving section of the community was in sympathy with such restoration, and regarded it as the best practical appreciation of the value of the ancient architecture; and that to be careless about or opposed to restoration was to be a "Philistine." Now the pendulum has swung the other way; it is "Philistine" to be an advocate of restoration, and those who regard themselves as "superior persons" mostly affect a great contempt and disgust for restoration and restorers, though in many cases this opinion is only parroted as a fashion by people who hardly understand the real grounds either for or against it.

It may be observed also that it is the fashion at present to class under the general term "restoration," or at all events "under the same condemnation," every sort of meddling with an old building, either by altering old work or adding new work to it. This suits the plan of campaign of the "anti-restorers," as it gives them a handle for tarring every one with the same brush who lays any sort of hand on an ancient building; but it is in many cases a misuse of language which leads to confusion of ideas. The term "restoration" is only properly applicable to two processes: (1) building up something which is supposed to have been once there and which has been destroyed, or (2) cleaning and refurbishing up and piecing old work to make it "as good as new." Adding new portions to an ancient structure is not "restoration," though it is frequently included under that term and visited with the same censure.

Both the restorers of the last generation and the "anti-scrapists" of the present day have made serious mistakes (though the mistakes of the former unhappily have had the more permanent consequences), owing to looking at only part of the truth about ancient buildings and shutting their eyes to the rest.

There are three kinds of value an ancient building may have for a modern generation: (1) its historic value as a record of the past; (2) its artistic value as a piece of architectural design; (3) its practical value as a building still in use for practical purposes. It was the mistake of the generation of restoring architects to ignore the first factor entirely; it appears to be the mistake of the "anti-scrapists" of the present generation to ignore the other two entirely. The real duty of the modern architect who is called upon either to alter, repair, or add to an old building, depends entirely upon the relative degree in which these several qualities of interest, the historic, the architectural, and the practical, are found in it; and his treatment of each ancient building must depend on the special circumstances of each case. No hard and fast rule can be laid down.

Before proceeding to illustrate this view more in detail, let me, however, say at once that I differ very little even from the extreme anti-restoration fanatics of the day in regard to what is, properly speaking, restoration in its purest form,—viz., the building up again of something which has disappeared, from indications found on the existing remains. Such indications never can give the real truth as to the disappeared portion; there may be the most probable, the most ingeniously logical restoration; but it is only probability after all. Therefore the restoration is absolutely valueless historically; it does not resemble the workmanship of the original builders, and we cannot say

positively that it resembles their design, and it would be far better to build up the destroyed portions our own way, as well as possible in an architectural and practical sense. But in the case of a complete design, of which a portion is gone, but of which the portion remaining gives the design entirely,—say in a continuous cloister, of which two bays have been ruined, and the rest are in good preservation, I consider it would be absurd to object to rebuilding the ruined bays in order to complete the design. For this, it must be observed, does not pretend to be history; this is a question of completeness of architectural effect, which is quite another matter. Architecture is design as well as history, and both elements claim consideration.

A line may be drawn, however, in regard to such work as carved detail, which cannot be precisely reproduced, like mouldings or tracery lines, and which usually differs in different portions of the same arcade, for instance. In such a case it is better for the new portions to show their novelty, and make no attempt to imitate ancient work, only to preserve such a general similarity in the balance of parts as may harmonise with the general design of the whole. Carving of figures or foliage stands on a very different footing from such purely architectural details as can be set out by measurement. The personal equation of the worker comes out much more strongly in such work, and it is impossible that any modern sculpture, for instance, can look like Medieval sculpture or harmonise with Medieval architecture. In the case of recent repairs to a Medieval gateway, repairs which were absolutely necessary for its safety, it was mentioned that a new figure was to be executed for the niche over the gateway, and the fragment of the old one still existing was to be put in a museum with other relics. I ventured to make the suggestion, in print, that the old fragment should be left where it was, and the new statue put in the museum. This was "wrote sarcastic," but the architect engaged took it seriously, and wrote to me that he had given the suggestion every consideration, but that the old remnant was too rotten to be left *in situ*, and that the authorities were very much pleased with the new statue. This is the way such things are generally settled. I see no objection in such a case to putting in a modern statue by the best modern sculptor you can get; but not a modern Medieval one, which is a mere pretence, neither one thing nor another.

That minor part of restoration which consists in cleaning, repairing, and refurbishing up what is old, is again a matter to be settled according to special circumstances. As a general rule, it is undesirable to interfere with exterior surfaces of buildings, not only because the effect of weather-stain and vegetation is far better, in a picturesque sense, than that of masonry scraped to the raw surface, but because such scraping is generally injurious to the wall, practically destroying the hardened skin which weathering has given it, and leaving it softer and more friable than before. There are few cases in which anything is gained by meddling thus with the exterior surface of an old wall. But in regard to interior cleaning and reparation the case is very different, when we are dealing with a building still in ordinary use. To say that the clergy and congregation of an ancient church which is in daily or weekly use for service, are not to clean off the whitewash with which it has been barbarously covered; not to have new seating if the old is worn, unsightly, or inconvenient; not to relay a battered and uneven floor with new tiles; all this is about as reasonable as to say that a man who happens to live in an old house is not to have new furniture, carpets, wall-papers, or decorations when he requires it. Cleanliness, order, decency, convenience, surely count for something in a place of worship in regular use. Yet people are gravely rebuked for the offence of making their churches clean and decent, and of removing clumsy and ugly fittings which have no affinity with the architecture of the church, because, forsooth, they are destroying the history of the various changes in the church. Rubbish! Such changes as covering mouldings and carving with whitewash, and putting up bad woodwork utterly out of keeping with the architectural character of the building, are pieces of "history" that are better forgotten. There are occasions, no doubt, when it is an æsthetic crime to remove the old fittings from a building. Such a case is that of Wren's famous church of St. Stephen's, Walbrook

By Mr. H. H. Statham. Read in the Section of Architecture at the Art Congress, Birmingham on Wednesday last.



where, within the last two or three years, the original seating has been removed (merely because it is out of the present ecclesiastical fashion), the floor-space cleared, and the pews replaced with open benches. In this case there is a real mischief done to the architectural design of the building, of which the original fittings formed an integral portion, the columns being designed with bases just above the level of the woodwork; they are now left standing on tall, bare pedestals, with no meaning at all, and entirely out of proportion to the columns; the columnar order having been specially designed to be seen only above the line of the woodwork. Thus the whole proportions and intended effect of Wren's original design are spoiled. Yet the very persons who would and did protest against this alteration, on the ground that it destroyed the architect's design, will equally protest against the removal of commonplace pews from a fine Medieval church, where they have nothing to do with the original architecture, and form an unsightly excrescence, entirely out of keeping with it. In the eyes of such critics, apparently, "whatever is, is right;" whatever is there is to remain, bad or good, architectural or not, simply because a previous generation put it there. This is nothing better than foolish bigotry, the only possible merit of which is that it saves people the trouble of thinking, or of forming an opinion on rational grounds, a kind of mental exertion which many people like to be saved.

But this new kind of bigotry is shown in even greater force when it is a question of making any addition to an old building. According to the views of those who pose as the special guardians of ancient buildings, it appears that a clergyman whose congregation has outgrown the size of an ancient church is not to make room for more worshippers by adding a new transept; another who wants a larger vestry is not to build it; a new organ-chamber for a larger organ is not to be added; or a clergyman is taken to task for sacrilegiously cutting a doorway through a Medieval wall to make a more convenient access from the vestry. All these cases refer to buildings in actual use for the purposes for which they were originally built; so that it comes to this, that the practical usefulness of a building is to be entirely set aside and regarded as of no consequence in comparison with its preservation in the form in which the present generation found it. That is a principle which has never been proposed or acted upon in the whole history of architecture until the present day, and it is a principle entirely opposed to common-sense and to the whole *raison d'être* of architecture. The basis of architecture is utility; and to put utility out of sight and act merely on sentiment—and sentiment of a very exaggerated and indiscriminating type—is simply a *reductio ad absurdum* for architecture.

A brief reference to some actual buildings and their treatment may be useful by way of further illustration of the fact that each case has its own special circumstances and requires to be considered in reference to them. Taking a building which has become an actual ruin, such as Kenilworth (to mention a notable example in this neighbourhood), there can be no doubt that in that case the sole thing to be done is to leave it alone, beyond doing what seems necessary to preserve it from further decay. A man who could propose to rebuild Kenilworth as a restoration of it as it existed say in Elizabeth's reign, would amply deserve any of the hard things which would certainly be said about him. It would destroy all the sentiment and all the historic interest of the ruins, and give us a mere sham in return. But the case is different with a building which is still architecturally complete, though in a neglected and dilapidated state. Dunblane Cathedral is such an instance; it is complete or nearly so as a shell, but was long in ruin internally, and partially roofless. The people of Dunblane recently conceived the idea of raising money, and asking for a Government grant in aid, for roofing and refitting this fine old church, and restoring it to the purposes of divine service for which it was originally built. Now, considering that the large majority of the more serious people of this country regard public worship as an important aid to religious life and faith (and, not being what is called an orthodox churchman myself, I am here speaking entirely without prejudice), it might surely have been thought that it was a most praiseworthy act to fit this building for its religious use, and to fill its long-silent spaces once more with the sound of

prayer and praise. But no; your anti-restoration fanatics will have none of this, and have actually done and said all they could to discredit the scheme and to excite the public mind against it, merely because the nave of the building has long stood empty and dilapidated, and they wish it to remain so still. People who act in such a spirit seem beyond the reach of argument or reason.

Another good illustrative case is that of Chester Cathedral, which I select partly because, living in the neighbourhood then, I saw a great deal of the work. The cathedral was almost refaced externally by Scott, and scraped, cleaned, and some ugly galleries removed internally, and a certain amount of decoration done. The worst thing done was the wooden vault over the nave, a barbarism for which there is not a word of defence to be said. But no reasonable person who knew the interior in old days, and how dismal, dirty, and neglected it looked, would deny that its present state is far more suitable to a church in daily use for service. The exterior is another matter. In its old state it was a delight to painters, the soft red sandstone being rounded and worn to such a degree that the whole looked, as I heard it remarked, like "an old sea-beaten rock"; of architectural detail there were, for the most part, but a few uncertain traces remaining; and the building certainly looked as if it was going to ruin. This was the pretext in fact, for refacing it, but I think the real reason was to give it "architectural style" again. Scott's clerk of works one day imprudently observed to me "You have no idea how strongly these old walls are bonded; it is sometimes a whole morning's work for two men to get one stone out." I replied "I thought you were doing all this to make the building secure," and for once the clerk of works, generally most loyal to his architect, had nothing to say. The cathedral externally is now practically a church of Scott's, with some late emendations by Sir A. Blomfield. The alteration has almost altered, one may say, the whole character of Chester, and if the cathedral was secure in its old state, I think it should have been left alone externally. It was at least picturesque and genuine. But I cannot help thinking that, in spite of the clerk of works' admission about the solidity of the walling, it may have been very questionable how long a building would have remained secure when the walls had once become furrowed and pitted in the way they were, and that all this must be considered before too hastily condemning the re-casing of the building. But there is one incident in Scott's restoration which is an example of the absurdity of conjectural restoration: I mean the stone pyramid to be seen over the east end of the south aisle. This is all the offspring of a bit of moulding and a sloping weather-mark found on the adjoining wall in the course of the restoration. Out of these elements, coupled with a record of a French abbot of Chester in the Transitional period, Scott ingeniously evolved this exceedingly French-looking termination to the aisle. The reasoning, based on such slender premises, was very clever; we were told in fact (according to the fashion of restoring architects in these cases) that "the evidence was quite complete." The evidence was complete that something of that kind was once there, but that is all; even if Scott knew exactly what it was it was no use doing it over again; but as the facts stand the erection is the very height of absurdity, a useless and ugly thing put up because there is some reason to suppose that somebody put up something like it seven or eight centuries ago.

St. Albans is another building that has its lesson as to looking at things from all sides. The fight over it began about the proposal to raise the nave roof to the old high pitch, and the anti-restorationists forthwith raised the cry that the existing roof was only in need of a little judicious repair to last for ever. They did not take the trouble to look at the roof first. I did; I went into it with a lantern, and I never saw such a mass of rotteness and decay pretending to call itself a roof; one hardly liked to trust one's own weight on it. A hue and cry was then raised about the old painted ceiling; could it be possible, it was said, that there was any talk of removing that? And what was this precious relic? A commonplace pattern in circles, such as any school-boy could draw with a pair of compasses, painted on thin hand-box slips of wood  $\frac{3}{4}$  to  $\frac{7}{8}$  of an

inch thick, and so rotten that many of the pieces could be crumbled in the fingers. Yet it was over this sort of stuff that a lamentation was set up, as if people were going to pull down the building. All this plays into the hands of a man like Lord Grimthorpe, who knows well how to turn it to account. And about the west front? Well, considering what the dilapidated state of the old west front was, that the west window was a debased affair in design, and ready to fall in pieces, and that almost every vestige of architectural detail had been eliminated from the façade; considering also that the building was about to start on a new career as a centre of a diocese, I say that to build a new façade to it was in itself a perfectly right, and reasonable and truly architectural project. The mischief was that a Chancellor of the Diocese, who boasted of his ignorance of architecture and declared that he could not understand a drawing if it was shown to him, gave over the unhappy building to a man who had no claim to meddle with it but the possession of money to indulge his whims, with the help of a half-educated clerk of works, who had picked up a smattering of Gothic, to do the designing for him. Such a proceeding, I believe, would be impossible in any other country but England. But the opponents of it took the wrong line. They insisted that no one ought to put a new façade to an old building, however dilapidated, and the common sense of the public was against them. They should have argued that such a task required the highest architectural power and culture to do it justice, and that it had been sold to a manifestly incompetent person. There might have been some chance of success on those lines.

The treatment of Westminster Hall is the last great *comp* in restoration, and not the least instructive. The origin of it all was that when the old Law Courts were removed from the west side of the building, a piece of Norman walling was uncovered; not Norman architecture, but simply Norman masonry, which was not in a condition to bear exposure to the weather, and in order to cover it up and preserve it, slight and rather doubtful indications of a former double cloister were brought forward, and such an erection was made over again, and we were assured, as in the case of Scott's pyramidal erection at Chester, that not a link of evidence was wanting for the "restoration," as it is called. It is the same thing over again: there was evidence that something of the sort was probably once there, and something of the sort is built again; but it is all conjectural in detail. Its historic value is absolutely nil. But as it was feared that public opinion would not stand all this expenditure for building a pretended Medieval "restoration," it was contended that the long low narrow rooms thus formed would be very useful, though their use has not yet been discovered. That is inverting the natural and logical process of architecture; creating a structure first, and endeavouring to find a use for it afterwards. That is the whole history of the Westminster Hall Restoration Committee can honestly make anything else out of it. And all this to preserve a piece of Norman wall—why, it is sheer fetishism, bowing down to every old stone wherever it is found. The Norman masons who built the wall would have laughed if they could have known of it.

Then what should have been done? I think I know what a Medieval architect would have done, and what in all probability Sir Charles Barry would have done; who, like every great architect, lived in the present and did not confine himself to worshipping the past. Either of them would, probably, have cut away the dilapidated, shaky, dilapidated buttresses like many pieces of cheese, and cased the whole exterior of the hall with a new design connecting it with the architecture of the great modern palace which has sprung up around it. The architectural glory of Westminster Hall is in its interior; its exterior, if it were ever intended to be seen (which it is open to question), had lost all architectural character at the time when it was laid bare by the removal of the old courts. What has now been built against it is an archæological sham, having no meaning or value, and introducing details entirely out of scale with their surroundings. What I have suggested, as the probable action of a genuine architect, Medieval or modern, would have resulted in a



architectural reality. No doubt, the very idea will make some people's hair stand on end. Then what do they say to William of Wykeham's treatment of Winchester nave?

Oh, but, we are told, there was a national style of architecture then; there is none now. Is that what the opponents of all interference with ancient buildings are waiting for? They will have to wait till the Greek Kalends, then. All that is gone for ever. How can there be a national style of architecture carried on in the same inevitable kind of way, with the same naive simplicity as Medieval architecture, recognising only one way of doing a thing, when history and modern means of rapid travel have brought our minds into contact with every style of the world, and every monument of ancient and modern architecture? Architecture is no longer national, it is individual, and it cannot be otherwise under the conditions of modern life. It has become a form of artistic expression; and if, on the one hand, we should give all value and admiration to the work of the past, we ought not to be so fond of doing good work in the present, even when the practical and structural circumstances which control architecture require that it should be done at the expense of the old. Time moves on, and old buildings cannot last for ever. Let us respect them, but not make fetiches of them. That is not the spirit in which anything great in architecture has ever been produced. Nothing seems to me more suitable, or more opposed to all real advancement of the art of architecture, than this kind of grovelling before an old building, merely because it is old. "True, it is dark and dilapidated, and, perhaps, unhealthy, and unsuited to modern requirements, but still spare it, for, alas, can do nothing to equal it; we are poor wambling bodies, who can produce nothing worth calling architecture now," and so on *ad libitum*. If architecture is dead, we let all events shall not do much to bring it to life again by folding our hands in despair, and lamenting over our incapacities. Rather let the modern architect, if it becomes necessary to remove or improve an old building that has done its work, strive with all his heart, and mind, and soul, and strength, to do something enter in its place. He may succeed: who knows?

#### THE ARCHITECTURAL ASSOCIATION.

THE second meeting of this Association for the present session was held on Friday, the 1st ult., in the meeting-room of the Royal Institute of British Architects, Conduit-street, Mr. Leonard Stokes, President, in the chair.

The minutes of the previous meeting having been read and confirmed, the following gentlemen were elected members of the Association, viz.:

Messrs. F. T. Maltby, C. G. Mayhew, G. H. Godall, T. A. Sladdin, P. F. Hookings, F. L. J. Farrow, F. E. Ward, W. J. A. Anderson, E. A. Richards, S. Leake, A. J. Dalton, E. P. Bannell, E. Kirk, E. P. Cameron, H. Webber, A. C. Allen, C. B. Thomas, E. H. Galshouse, J. H. Jones, H. E. Jones, W. A. Forsyth, T. J. W. Anderson, G. E. Boys, P. C. Fuller, J. H. Tyars, F. W. Chancellor, R. T. Barker, A. H. L. Mackenzie, H. S. East, O. C. Hill, E. A. Vigers, C. E. Blackwood, J. J. Chalmers Francis, P. Soames, H. H. Robinson, Lester Binns, R. Jones, J. Haire, and A. Spiers.

Mr. F. T. Baggallay proposed the adoption of the report of the Committee for the past year.

Mr. Brodie seconded the motion, which was unanimously agreed to.

On the motion of the Chairman a vote of thanks was accorded to the auditors, Mr. Max Clarke and Mr. W. Campbell Jones.

Mr. F. R. Farrow (senior hon. sec.) announced that the special business meeting, advertised in the "Brown Book" for November 28, would be postponed to December 12, and that Mr. W. H. White (Secretary of the Royal Institute of British Architects) would read his paper on November 28.

*The Past, Present, and Future of the Association.*

Four papers were then read by Messrs. A. Beresford Pite, Walter Millard, Needham Wilson, and Owen Fleming on "The Past, Present, and Future of the Architectural Association."

#### Mr. Pite's Paper.

That the past has produced the present as we find it to-night is a sufficient statement of the soundness of the original constitution of the

Architectural Association, as well as of the wise elasticity which has permitted it to enjoy such a rapid and easy growth to success.

Within certain limits, and in attaining certain objects, the Architectural Association has undoubtedly been a success, and a great success. Its influence and constituency are practically as wide as its profession, for it gathers all students within its ranks upon the commencement of their career, edifies, amuses, and benefits them with companionships. It provides the best occupations for their spare hours, offers them small prizes for competition, and, as becomes a society existing in this age of eloquence, affords the various novices facilities for debating and discussing papers and lectures; and lastly, and this has a not unimportant influence upon the present crisis, develops the young man's powers of statesmanship by initiating him into committees and their peculiar ways, early adorns him with titles and Vice-Presidentships, and ere his wisdom-teeth are cut he dreams of a night that he is sitting in that elaborately-carved Romanesque throne which inspires its occupants with Presidential gravity and sapience.

By means of its ordinary meetings, essays and lectures upon every branch of architecture have been published, that in quantity and interest, if not in weight or polish, rival the papers produced for the Institute, and in these days quantity in production means energy, and interest in matter popularity. Our papers are produced in theory for fellow-students but are equally valuable to the whole body of architects, viz., papers on "Lunatic Asylums," "Hospitals," "Continental Tours," "Water-supply to County Houses," and many others whereon published authorities are either scarce, silent, or ignorant. And the discussions that have ensued have been provided with the most patient, attentive, and generous audience for the speakers to be found in the profession.

But below the surface the work has been quite as successful, the number of those who have needed the help of classes has been few in comparison to the whole body. But one year only, as a rule, is wanted for attendance at each class, but many, and may their number ever be lengthened, for membership of the Association.

Many classes in construction, surveying, drawing, and design have been formed among the members, really upon their own initiative, and wider experience has been gained by such contact with fellows in better or worse offices than oneself, and an ardour and emulation has existed among visitors and teachers to be armed against mistakes and pitfalls.

An important factor in this success has been that opportunities for architectural study have been given without interfering or competing with any of the surrounding and more regular methods of architectural education. The invaluable series of lectures at University and King's Colleges and the work of the Royal Academy Architectural Schools have not been interfered with, and we have always retained the invaluable help of the professors at the colleges and their recommendations to our classes. Their time-tables have fitted in with the Architectural Association calendar, and our harmony and elasticity of constitution have again ensured success, as the Architectural Association has never offered lecturers to equal or rival the late Professors Cockerel, Donaldson, and Hosking. No attempt has been made to discredit the apprenticeship system, as nothing in the constitution of the Association clashes with the usual requirements of articles of pupillage, and the hands of the pupil have been strengthened in the classes of construction where he supplements and tests by question and answer, his daily learnings and observations; and by classes of design, where he learns to be impracticable, visionary, and poetic, and builds temples and abbeys that no sane master could afford time or patience to thoroughly criticise.

It should not be supposed that a practising architect's pupil could acquire knowledge of the archaeological and antiquarian branches of architecture without an added stimulus to enthusiasm, or that his defective early education in mathematics or free-hand drawing should be remedied by premiums to business men,—such enthusiasms must be cultivated, and such defects remedied by courses of Drs. "Eirikbeck" and "A. A.," and our part has been most successfully done; the confidence of the pupil in himself has been increased, and the sympathy of the whole body of practising architects

enlisted on behalf of the Association. I have always believed it below the dignity of this Association to discuss the relations and mutual duties of architects to pupils; but as the question undoubtedly bears most largely upon architectural education, it cannot be overlooked in a review of the work of the Association. The architect in practice is presumably qualified to practice, and the pupil that he contracts to teach is to be provided with similar qualifications, so that in a given time he may similarly practise. Now, I do not suppose that it will be maintained here, for a moment, that the majority, or a large minority, or any considerable number whatever of the practising architects of London, are not fairly and properly qualified for ordinary business practice. Business experience goes for much, nowadays,—for a great deal too much in architecture,—but as long as injunctions are so perilously easy, builders so eccentric, workmen so stupid, surveyors so tortuous in their accounts, and district surveyors so nervous and legal, this experience must be bought, as it is indispensable, for without it you cannot be a "practising" architect. Now, all this has been recognised by the Association, and the lighter and pleasanter paths of design and colour, and the interesting discussion of constructive questions, have proved to be attractive to a large number of students, to whom our policy of co-operation has proved a very successful aid.

One other point, and I have done with the past. What has it done for the higher and ultimate objects of the Architectural Association? There is an object beyond the offering of facilities to architectural students, the improvement of the individual architect is not the only end in view or the final results of our operations. As the Association takes the young architect in hand at the period when his mind is most open to high ideals, we have here energies that only need right guidance and encouragement to react upon our national art. The work and influence of the Association need not, and must not, be devoted to the cultivation of professionalism, to the neglect of wider and greater influence upon the practice of the art of architecture. In the past this sphere has been only occupied spasmodically. The influence of artistic men has been felt in the classes of design and colour, in the discussion and criticism of current design at the ordinary meetings, and in the improvement and advancement of constructive ingenuity and simplicity at the construction classes. But this field has been scarcely cultivated. The fact does not seem to have been fully grasped that by influencing for art a large body of young enthusiastic architects the outward and visible architecture of our streets and country places might be vastly changed. For many years past it seems to have been taken for granted that unity of artistic feeling and aim was impossible; that we were hopelessly divided into two or three irreconcilable schools of design, and that though all owned the same constructive habits and practice, it was undesirable and impossible that unity of artistic aim and feeling could be secured. But this is rapidly becoming a dead tradition, and "design with beauty build in truth," because it dates from the past, almost sounds as if it had a covert intention of setting rival schools, which either preferred beauty in design to truth in construction, or naked truth in building to designed beauty, at war with each other. The doctrine of the unity of architectural art is the result of the throes and struggles of this singular century, issuing, we hope, in that more perfect brotherhood of all the arts which has distinguished the great art movements of the past.

But our present, our controversies, the subjects that most frequently appear in our discussions and programmes, the burning questions of the day and hour, what are they? What do they mean? What is their tendency? In what direction are the forces of this Association being bent? In the inverse order of our review of the past, are we intent first upon the advancement of art? upon the recognition of its essential unity and power upon national life? Are we bent upon manifesting in our student designs, in those small jobs upon which we cut our teeth, in those competitions which fill us so full of hope and dreams, that we intend to develop with sincere industry in detail, with the greatest patience and revision, all the powers of design for which our work gives us the opportunity? Are we determined to win for English architects the merit of loving



care and watchfulness over every delicacy or strength of effect that can be earned by the texture of our national materials, or by the cultivation of the very peculiar light and shade of our uncertain climate, or of reflecting in our business premises the uncompromising subjection of every feature to usefulness and suitability, and in our public edifices of the same qualities, with the added problems of monumental character and of centralised classification? Alas, no! the burning question, the will-o'-the-wisp of the hour, the present ideal of future attainment is professional qualification, tested by enigmatic examination, to be sealed by legislative enactment in registration, against all poaching by "auctioneers, land-agents, and surveyors" or other unauthorised and uncharted commission agents. The bosom of this Association is now heaving with emotion and excitement, not to ascertain wherein lies the power of such great designers as Burgess, Street, Godwin, Thompson, or Cockerell, but as to how best to solve "apophyge," "hagioscope," "acrotelia," or "ambon," and as to which is the safest method of guessing the number of columns in a temple, or either of spelling in writing or of pronouncing in  *viva voce* the names of some "leading architects" of a selected period. Could pedantry be more apply illustrated than by such questionings? or the docility of the youthful architectural mind by submission to them? And then the all-importance of constructive knowledge is to be demonstrated by playing a sort of "lucky bag" game with an architect's compendium of building materials, or by a specification, written without drawings, details, or locality, in an hour and a half. Here, therefore, is work enough for specially-trained teachers for new classes, for a whole race of newly-created pedants and pedagogues. Hence, our present excitement and labour over "curriculum," and our forgetfulness that "architects," to quote Mr. Sedding's admirable dictum,—not a new one, either,—*"must be artists first."* For we listen to, and take in, advice as to "education" and "qualification," as to "curriculum" and "diploma," from men who, whatever else their attainment, are not "artists first," and who could not, with any facility, produce good architecture.

At present we are off the track; in the absence of Scott, Street, Burgess, and Godwin we have gone astray. The great designers that remain who were their later contemporaries, and who share their powers and zeal, are unfortunately silent and prefer retirement. So that we are left to unartistic boards of examiners and the feebleness of their inexperience. Our eager young men take up the programme of the "examination in architecture" (sad misnomer), and in default of better leaders imagine that the position and dignity offered by the consolidated ranks of the examined is the best object of their early aim, and what classes are formed or fees propounded will be accepted with this end, and architecture will fade away from the brilliant position that the free efforts of the great artistic enthusiasts have obtained for her and become scrappily academic and intolerably dull. The profession may be advanced and the art will be forgotten.

But what for the future? What is the hope of the Architectural Association? Let it be a lofty one; let us not be afraid of having somewhat of a distinctive ambition and idea of our own. We have inherited a good constitution that has proved itself to possess the elements requisite for enduring and for accommodating itself to the times. Our system of co-operative assistance in education can be maintained and enlarged in whatever direction or degree may be necessary for the real advancement of the architectural and artistic knowledge of our members. Classes for drawing from the antique, for architectural modelling in wax or plaster, for perspective drawing, for the systematic criticism of modern work, and the analysing of the design of ancient buildings, might perhaps be added to those already existing, and embrace a practical and artistic range of subjects quite outside the purview of examination boards. There will be no need for revolutionary measures, the ultimate object of which is to create a constituency for the Royal Institute of British Architects, and which must issue in the forsaking of the Association, so soon as the examination is passed and the Associateship of the Institute acquired.

The curriculum that has been propounded essentially reforms the whole work of the Association upon the basis of this examination programme of the Institute. It is proposed to

do this very thoroughly, at the expense of our old traditions, and, I fear, of our old success. I wish to ask, in conclusion, is the end to be attained worth the sacrifice? Will the recognition of the examination as our goal and object advance the Association in numbers, friends, and usefulness? Will our old success remain to us as an independent body when we have sacrificed individuality to the generalisation of the academic programme? Does all this tend to the advancement of the art of architecture? Will the hitherto small share that the Association has had in stimulating the enthusiasm of students for the work of great architects, and the appreciative zeal and emulation of their pupils be increased by the reduction to a curriculum of artistic freedom and by the ignoring of all sources of architectural knowledge and skill that cannot be learnt from books, crammed for examination, or distilled into questions and conundrums?

This subject has naturally led one face to face with the Associateship examination of the Institute, and solely because it is proposed to impress and cast it upon the entire work of the Association in the future, have I been led to criticise it. I believe it to be in part a fair test of certain qualifications for the surveyor's part of the architect's many-sided character, but it is ill applied and ill suited to encourage appreciation of daily office work, or to improve the daily practice of a student. It removes him from the study of a great and noble art, from the contemplation of the vast and renowned beauties of the architecture of the world, to the consideration of papers of questions that reveal in every line the fact that the examiners have mistaken definition of terms, or extemporaneous delineation of features, for knowledge of principles and discernment of fitness and beauty. In conclusion, I would exhort students to seek instruction and emulation from the examples and work of the really great masters of the nineteenth century, from those who, by patient and long observation and study, have produced beautiful architecture, from those, in other words whose works entitle them to be the guides, teachers, and if need be, examiners of young architects, and not from men whose chief claim to our attention is their enthusiasm for mere professionalism and diplomatic examination; remembering what I think must be an incontrovertible fact, that if the great modern architects, whose premature departure has been so disastrous,—Street, Burgess, and Godwin,—were alive and with us, the R.I.B.A. compulsory examination would scarcely yet have come into existence.

#### Mr. Millard's Paper.

In reluctantly complying with the Committee's request that I would read a short paper on the subject of "The Present, the Past, and the Future of the Architectural Association," I must state that I am unable to offer you anything more than my own one-sided opinions on the question, just as I have held them for, some time past,—only to get more and more confirmed in them, and without professing to have made a complete or exhaustive study of the whole subject. I regret this the more, seeing that, as it happens, it is nothing particularly pleasant,—or original either,—that I can find to say on this topic.

On the last occasion that I had the honour of reading a paper before the Association, some three years and a half ago, I concluded with this proposition, viz., that "Our whole profession, as a body, is responsible for the training of its pupils." To this, of course, you very possibly may decline altogether to assent, preferring to regard our profession as one holding a position before the public so different from those of law or medicine, for example, as to admit of no parallel being established between them and ourselves, regarding it, in short, as a profession that is *not* responsible, as a body, for the training of its pupils; but, if there be any here who do agree with me as to the substantial truth of my proposition, I may hope to have them, at any rate, with me in asking whether all, or nearly all, is done that might be done by the whole profession, as a body, towards fulfilling what we believe to be its responsibility for professional training in general.

An intelligent inquirer who desired to comprehend what manner of profession ours is, how recruited, and how practised, would, on extending his inquiries far enough, see scattered all through the kingdom,—throughout the Empire, we may say,—a large and ever-increasing

number of men, more or less busily pursuing practice as architects, for the benefit of their employers, the general public partly, and to some extent, perhaps, also for their own pleasure,—and profit; and further, he would observe some of these gathering by degrees in several of the larger centres of population into knots and groups known as professional societies, various in size, and, though with certain common aims mainly independent of one another to begin with, as were their individual members.

Among these societies he would note more particularly two, in the metropolis, presenting at first sight some semblance of joint action, both being housed under the same roof, and, by the courtesy of one of them, both holding meetings in the very same room. One, he would learn, had been founded as "an institution for the general advancement of Civil Architecture and for promoting and facilitating the acquirement of the knowledge of the various arts and sciences connected therewith," whilst the other had for its "objects" 1. "To afford facilities for the study of Civil Architecture," 2. "To advance the profession," 3. To serve as a medium of friendly communication between the members and others interested in the progress of the art." Whatever the difference between these two manifestoes may appear to amount to, our enquirer, in watching how they "come out in execution,"—to use a professional term,—would find one Society ardently professing to be a teaching body, the other, for its own part, proclaiming that it is not so.

Naturally, then, our inquiring friend, who would probably wish to begin his investigations into this interesting profession of ours somewhere towards the beginning, might be expected to first turn his attention to a society, where professional education is, by common repute, carried on; and a society, too, on whose model the majority of the professional societies,—aiming at being teaching bodies—appear to be formed, to a great extent. From observing its present condition he might find himself gradually led into studying its past, and perhaps even speculating on its future. I could imagine that, whilst thus engaged, he might more than once stop and ask, "But is this society, then, commissioned in any special way by your profession at large to dispense architectural knowledge? and is this teaching which it is imparting by its various 'methods' supposed to represent the most generally approved means of preparing students for practice? Is this the course of training that architects go through? and, if not, where any such thing to be found?"

Then, to be sure, it would have to be gently broken to him that there are thought to be *more* ways than one of gaining instruction in our profession—several more—and that there is no such thing as any sort of monopoly in the business of supplying it. "The other society of the premises," he would be told—"the Royal Institute of British Architects—has got itself clothed with authority to examine as to whether or not the knowledge has been acquired, but apparently without caring much to know or whence it has been obtained." The illustration of the various ways by which one may gain instruction in our profession, numberless sources of special knowledge in the shape of lectures and schools, libraries at home—besides office experience—would be indicated, nearly all of some use, at some particular point in a student's career, and most invaluable to him, but all without organisation, arrangement or connexion, each going independently in true British fashion. This, perhaps at length would the actual state of the case dawn upon our intelligent friend, and he would find himself contemplating—yes, a marvellous—at a great profession, whose members, when interrogated, are unable to point to any systematic or definite course of special training generally recognised by the whole body as an established means whereby intending members can secure even so much as what may be termed the irreducible minimum of absolutely indispensable knowledge for entering on practice.

One almost fancies one can hear our friend concluding his inquiries about us with a remark to himself, quite low, "Verily they must be a profession of born artists!"

To return to our Association itself; we have we really to show to intelligent inquirers? Well, looking at our recently-issued Book, which has come out at last, and bigger than ever, bristling with particulars and repu-



of something like a dozen different classes, about half as many courses of lectures, and of open prizes, and with a roll of over 1,100 members, we seem to make quite a brave show—on paper. But, let me ask, have not many of us, who are only too painfully aware of such things as shortcomings in our system, often enough limited sadly,—if not blushed,—at hearing the good-natured words of praise for past efforts and of encouragement for the future, every now and then pronounced like a benediction over us by generous but undiscriminating well-wishers, sometimes even by those who might have been supposed to be too familiar with the facts?

Besides those who from afar "beam" on us through rose-coloured glasses without having themselves had any actual experience in the inner working of the Association, there are others, not a few, who, having in the exuberance of their youth given their invaluable assistance in earlier days,—the "fathers" of the Association,—continue still to indulge in the amiable fondness so natural to parents and grandparents, and, as usual, are just a wee-bit prone to overlook the indisputable fact that "the child" has grown up.

Nevertheless, for such a task as fairly grappling with the problem of education for a great profession, the Architectural Association is now notoriously and ludicrously inadequate. And what wonder that it is so? From the beginning the thing has been on a false bottom, from which it has not even yet succeeded in rising entirely.

Undoubtedly not genuinely self-supporting it has for years and years depended for its main working power on voluntary labour, as a matter of fact, on the surplus energy of a comparatively small minority of its members given occasionally out of their spare overtime, whilst on the part of the recipients of the benefits received, the—anything but lavish—expenditure of one hundred and twenty-six pence per annum, with an odd shilling or two extra for class fees, has long been supposed to count as a fair contribution to meet working expenses.

Did anyone ever hear of other professions—lawyers, for instance, or the doctors, or the artists, doing this sort of thing, and trusting to turn out qualified practitioners or even assistants, on such terms? It may appear, on the face of it, an economical way of going to work; but surely architects, of all people, have a pretty good reason to know something of a certain not-uncommon accompaniment to cheapness and superficial economy. Somehow, their luckless profession seems to be distinguished by a peculiar and hopeless propensity for performing services gratuitously,—or for next to nothing. See, just for the sake of argument, how we meekly suffer ourselves to be fleeced by the public in the matter of competitions alone! Charity may come either as a blessing or a blight, according to circumstances, and, for this broken reed—voluntary aid—I do prefer to say the Association has lately done what it has accomplished for itself, in spite of, rather than by means of, its meant aid. Worse than being merely inefficient for existing needs, it has been misleading, in so far as it has had the result of leading others to believe and say, and us to say ourselves—even if not fully to believe—that all's well, or, at any rate, "pretty well." How the Architectural Association body came into existence, got on its legs, and has managed to stagger along so far, is a matter of history. Ridiculously, for years past, as we know, and probably from the first, it has kept on showing symptoms of suffering from inherent chronic inability—as might be expected from a weak institution. Witness, the extra-special committees of investigation into things in general, like seem to be appointed, on an average, every other year.

Not I am sorry to say, using another simile, I can make it out to be, at best, is a rickety concern on a rotten foundation, liable to condemnation as "a dangerous structure." It is "shoring up and underpinning" at least; "rubbing down, stopping, and painting;" new coats won't meet the case. Still, just as, proverbially, a creaking door goes long on its hinges, so it is perhaps conceivable that the old Architectural Association nature, which has creaked for so many years, might manage to creak on, as hitherto, for their decade or so; if no serious effort be made to save it from itself. To continue harping on that one string, the old-fashioned argument, that the Association was not intended or established to do any such things as some

of us think it might accomplish,—with advantage in every way to all,—is as much as to say that we, the successors to an inheritance, are less free to act in the management of it than they who created it were in their day. Besides, have we not already decided it is high time to take proper steps for superseding our desultory, amateurish methods of instruction by something more like real "business?" The day has gone by for half-trained architects, brought up, more or less, on a semi-gratuitous system, or otherwise.

In the past, then, as I read it, we have seen the Association spring up into its place, like a forlorn hope, owing to the sheer necessities of the situation—the parent profession having steadily neglected, through its responsible executive the Institute, its bounden duty of looking after and directing the training of its recruits, as though it expected to enlist them ready-drilled; we have watched these latter struggling bravely with their desperate task, so gallantly, and in some respects so successfully for the time being, as to deceive others and even themselves, year after year, into supposing they were really equal to it; thus enabling the great slothful parent to its own soothing its conscience in regard to its own responsibility. Still, thank goodness! it is not always utterly in vain that even a forlorn hope is led. The Association has stood in the breach and, in the true spirit of self-sacrifice, done deeds that will for ever count to its honour and glory, and to the shame of those through whose blundering neglect it was driven to do them.

And now we, in the present, seeing what has been accomplished, and what still remains to be done, can't help exclaiming, "*C'est magnifique, mais ce n'est pas l'éducation*;" it is not systematic training worthy of a great and learned profession at this time of day." It won't suffice, as it is, for the future.

The civil engineers and the surveyors seem to have been wiser in their generation than we architects, in not leaving their students to "set up" for themselves in the business of conducting education; for both the influential Institutions in Great George-street keep their students under their own eye. What deplorable, if not culpable, short-sightedness it must have been on the part of the seniors of our profession, when busying themselves about the founding of their Institute, to go and practically shut out the juniors to such an extent as to apparently leave them no alternative but to start an Association for their own protection and benefit. What a huge initial blunder! looked at even as regards the true interests of the Institute alone. Think what a very much stronger position this would have been in for years past, if it had owned its students from the first!

And now, for any one to pronounce authoritatively,—with whatever approach to accuracy, in face of the Charter from which I have quoted,—that the Institute is not a teaching body, never has been and never was intended to be, may be to make a statement of fact, but, even in that case; not necessarily a fact to hold up one's head about, or to tamely rest content with,—hardly a thing, one would suppose, to sit twiddling your thumbs over. The statement itself, by the way, seems to be worth just about as much as it would have been worth saying, some years ago, that the Institute was not an examining body and was not intended to be so. Instead of education, the juniors were given examination alone,—a part, in place of the whole, and, moreover, not the most important part first!

Is the Institute, I wonder, ambitiously bent on following the example of the University of London in holding aloof as long as it dares from taking a part in conducting education, on the plea that it is quite sufficient to examine, and that nothing more was ever intended to be done? What do we see now in the case of this latter Institution? Why, the probable assumption by it in the immediate future, if I mistake not, of responsibility for teaching in addition to examining and degree-giving; thanks to the gentle aid of a Royal Commission and the threat of a rival teaching university arising to undertake the work of education, if it be shirked any longer by the existing authority.

The fact is, the Institute, as the chartered representative before the public of the profession, cannot,—at its peril,—and will not evade any clearly-defined duty to the profession now-days, whatever it may have done in the past. Only let the profession make up its mind and speak out unmistakably.

At this moment, I submit, the Institute, by sheer good fortune, has an exceptional opportunity to not only make some atonement for past weakness, but to secure to itself a sure source of strength for the future, if only it will boldly seize it, and, even at this eleventh hour, offer honourable terms to the Association. A good working alliance between the Institute and the Association presents to my mind the only rational solution of the whole question of our professional education.

Nor is there any insurmountable obstacle to such a thing requiring removal first of all.

By-law XVI. of the Institute says—"Branches of the Royal Institute may be established according to regulations to be made from time to time by the Council," and, according to clause 17 of the charter, "The Council may, subject to such limitations or restrictions as by-laws may from time to time prescribe, apply the funds of the Royal Institute in furthering professional education." The Association would be doing itself nothing but honour in becoming the educational branch of the Royal Institute of British Architects, enabling them to exercise their permissive powers, whilst retaining, by proper mutual arrangement, its own system and methods of self-government for its own particular affairs; and moreover, at the same time securing for its special work the material and moral support of the corporate body of architects, and through them of the whole profession they represent. The prestige and real strength thereby accruing to the Association would far more than outweigh any imaginable loss of influence or dignity based on feeble and empty independence.

To obtain the sanction of the Institute to the appointment of instructors and lecturers would be to invest these with an importance and to give them a position in the eyes of the world which can never be conferred by the Association of itself. Consequently, a far wider field would be opened from which to draw instructors. Then may we hope to see some approach to an ideal course of training for an architect, commenced in schools and workshops,—as of old, and crowned by what I would call advanced pupillage in offices. And in connexion with this, I am not ashamed to again put forward a pet project of mine which I have already advanced. It is that of Pupil Scholarships, similar to what exist for the Bar, at the Inner and Middle Temple, whereby successful candidates are enabled to spend a definite period in the chambers of any leader they themselves may decide on reading with,—the necessary premium being paid out of the Scholarship fund.

Of course, some few prejudices would have to be sunk or swallowed on both sides, but that both sides should cheerfully give and take a little, is of the very essence of a good bargain. It would probably conduce not a little to such a result in this case, if only we each did our best to look at the matter as making for (1) the common good of our entire profession as a whole; (2) the general benefit of our own particular society; and (3) the personal advantage to each of us individually, instead of regarding it in the reverse order.

Not that I think anybody even in this case would have any real ground for objection.

But it is so natural and easy, for the best of us, to make a handle of some particular point, in a comprehensive scheme, that may seem to be the least bit unfavourable to us, and to make that a ground for opposing the whole measure. It is so easy to take it for granted that the interests of all must be identical with what one fancies, for the moment, to be one's own.

A fusion of the two bodies would mean power to them for real good, just as their disunion must imply comparative weakness and inefficiency, because involving needless waste of power, which might be economised and directed to more advantage, with more intelligent distribution and application. And not to our two societies alone would 'the beneficial effect of their joint action be advantageous, but, what is of vastly wider importance, it would be felt in the end as a re-vivifying influence throughout our whole profession. Surely, then, it is for the whole profession to see to it.

Being a member, as I am, of both societies, and not connected in any official capacity,—to speak of,—with either, I have felt no hesitation whatever in saying all I mean concerning both; and I now appeal to the members of both, as individuals, to both societies as organised bodies, and to our great profession at large,—



as a whole, to act up to and discharge the responsibility for the training of its pupils which, I maintain, rests on it as a profession.

This alliance would afford a means,—and, I believe, the best means,—for doing so. Many, perhaps, will be found at first to declare it is inadvisable,—some even that it is impossible. I have ventured to support and urge it in full confidence because I firmly believe it to be not only advisable and feasible, but, even more than that,—ultimately inevitable!\*

#### ARCHITECTURAL SOCIETIES.

**LIVERPOOL ARCHITECTURAL SOCIETY.**—The second ordinary meeting of the present session of this Society was held on Monday evening in the Royal Institution, Colquitt-street. Mr. T. Mellard Reade, President, occupied the chair. Mr. J. H. Woodhouse, of Manchester, read an exhaustive paper, the subject of which was, "A few Recent Notes in Holland and Belgium." Aided by a number of sketches, he described the architectural and other features of the principal towns in the countries named, and received at the close a cordial vote of thanks.

**MANCHESTER SOCIETY OF ARCHITECTS.**—At the annual meeting of the Manchester Society of Architects, held on the 30th ult., Mr. R. Knill Freeman, F.R.I.B.A., was re-elected president. In the students' competition, the first prize of seven guineas was awarded to Mr. Roger Oldham, and the second of five guineas to Mr. Harold Brakspeare.

#### THE LONDON COUNTY COUNCIL.

The ordinary weekly meeting of this Council was held on Tuesday last, Sir John Lubbock in the chair.

**The Bethnal-green Slum Scheme.**—Nearly the whole period of the sitting of the Council was occupied by the adjourned discussion of the report of the Housing of the Working Classes Committee recommending the removal of a large slum in Bethnal-green (see text of the report in our last issue (p. 347).

After nearly four hours' debate, Mr. Watney's amendment, the terms of which we gave last week (p. 348), was rejected by 41 votes, 72 votes against, to 31 votes for.

Mr. Beuchcroft then moved as a further amendment:—

"(a) That the Council, whilst satisfied that the area comprised in the official representation from Bethnal-green is an unhealthy one, considers, having regard to the provisions of the Housing of the Working Classes Act, 1890, and to the requirements of other districts in London, that it should be dealt with partly by an improvement scheme under Part I. of the Act, partly by a scheme or schemes under Part II. of the Act, and, as to the remainder of the area, under the provisions of the Act relating to unhealthy dwellings—houses and obstructive buildings; that accordingly the portion of the area to be dealt with under Part I. be the part lying to the east of and including the area of the road marked on the plan before the Council as intended street running north and south from Virginia-road to Church-street, and including sufficient land to the west thereof for the purpose of building frontage, but excluding that part of the area which lies on the east side of Mount-street (the estimated net cost of such an improvement scheme, including roads and sewers, being 138,000.) and that the requisite resolution under Section 4 of the Act be passed accordingly.

(b) That the draft scheme submitted by the Committee, modified in accordance with the foregoing resolution, be approved, and that it be referred to the Committee to take all necessary steps for depositing and obtaining confirmation thereof, and further, that it be an instruction to the Committee to represent to the local authority that the part of the area on the east side of Mount-street, and the part lying centrally between Fournier-street and Half-Nicol-street, should be dealt with by that authority by an improvement scheme or schemes under part 2 of the Act, and the provisions of the Act in regard to unhealthy houses and obstructive buildings rigorously enforced as to the remainder of the area; and that failing prompt action by the local authority, the Committee be authorised to take such initial steps as they may see fit to give effect to this resolution, reporting thereon to the Council."

This amendment was seconded by Mr. Costelloe, and after a short discussion, it was

\* We are obliged to hold over the papers read by Mr. Needham Wilson and Mr. Owen Fleming, together with some notes of the discussion which followed, until next week.

rejected by a majority of 24 votes, 58 votes against to 34 votes for.

The recommendations contained in the Committee's report were then formally agreed to, with the following additions, moved by Mr. Marsland, and accepted by Lord Compton as Chairman of the Committee, viz.,

"And that it be an instruction to the Committee to report to the Council, before proceeding to carry out the scheme when it is confirmed, as to what steps will be taken to limit as far as possible the amount of compensation to owners of insanitary houses, and also as to their proposals for a gradual clearance of the area and for the rehousing of those displaced by the scheme."

The Council then adjourned.

#### Correspondence.

To the Editor of THE BUILDER.

#### BERMONDSEY FREE LIBRARY COMPETITION.

SIR,—It will be in the recollection of your readers who were interested in this competition how the Library Commissioners violated, without apology or explanation, their own specific conditions which they laid down for the entrants to this competition. Yet another instance has to be recorded. I have received a list of tenders sent in on the accepted design. The highest, 8,840l., the lowest,—Messrs. H. & H. F. Higgs,—7,030l., as amended and accepted, 6,170l. The conditions gave an outlay of "5,000l., or thereabouts." COLE A. ADAMS.

Westminster, Nov. 4.

#### TENDERS FOR WORKS AT THE WOOLWICH UNION.

SIR,—I beg to call your attention to the terms offered to builders wishing to complete for the proposed additions to the above Union House, as set forth in the advertisement in the *Builder* of Saturday last, viz., that every builder competing shall deposit with the architect of the board a 50l. bank-note until the completion of the contract. From an intimate acquaintance with building contracts of late years, I know that through keen competition and want of proper organisation, many builders now sign, perhaps, the most inequitable contracts offered in any trade, but I should hope they will not be tempted to deposit for several months a large sum of money without interest with a parochial board.

MATTHEW H. HADLAND.

30, New Bridge-street, E.C., November 4.

#### DEATH IN THE VENTILATOR.

SIR,—Notwithstanding all that has been published in the professional and trades journals about the danger to the occupants of houses when no provision is made for the prevention of the siphonage of the water-traps of the closets, we find within the last few weeks a firm of gas engineers actually advertising and recommending the use of an appliance for soil-pipes, which if used would have the effect of causing siphonage of the water-traps of the closets, and so allowing the houses to get polluted with foul air from the soil-pipes!

I refer to a ventilator or cowl with a balanced valve upon the top of the pipe inside of the cowl, which valve shuts against any attempt at down-draught. Now as the ventilating pipe of a soil-pipe is put up for the purpose of letting air in (for the prevention of siphonage) as well as for letting it out, it follows that one of the principal uses of the soil-pipe ventilator is counteracted by the insertion of this anti-down-draught valve upon the top of the soil-pipe.

The use of this valve is being puffed up as a grand new A.D. 1890 idea, but it so happens that it was invented by me about twelve years ago, and it was referred to by the late Mr. Wm. Eassie, C.E., the well-known sanitary engineer, in his "Dictionary of Sanitary Appliances," as mine. It was not intended to be used for ventilating soil-pipes, however, so for the safety of the public and the credit of the plumbing trade I respectfully ask you to publish this caution, so that neither plumbers nor any other persons may put a ventilator with a self-closing anti-down-draught valve upon the top of any soil-pipe; and, further, if any person has already, owing to ignorance of its bad effect, or unwittingly, put up one, it should be immediately taken down and the valve removed.—I am, &c.,

W. P. BUCHAN.

Glasgow, November 3, 1890.

THE "STUDENT'S COLUMN."—In consequence of unusual pressure on our space, we are compelled to postpone this week's chapter of the Student's Column to our next issue.

#### GENERAL BUILDING NEWS.

**THE NEW SCOTLAND-YARD.**—The new headquarters for the Metropolitan Police are now practically completed, and have been opened this week. We are obliged to hold over our description of the building until next week.

**THORNE, NEAR DONCASTER.**—Messrs. William Lewis & Son, architects, of York, have prepared plans for a new farm-house on the Levels estate. The work has been let to Messrs. Smith Bros., contractors, Thorne. For the Heslington estate, Yorkshire, the same architects have prepared plans for covered folds, with alterations and repairs, to about forty farmsteads on this estate. The contracts have been let to different contractors.

**CHURCH EXTENSION AT WESTON-SUPER-MARE.**—The new south aisle of the parish church of St. John, Weston-super-Mare, was opened by the Bishop of Bath and Wells on the 29th ult. The new aisle has three windows, with Perpendicular tracery and transoms. The buttresses have pinnacles enriched with crocket terminals and traceried panels, and the gallery ceiling is of panelled wood-work. The arcading is executed in stone-work, with panels and angle columns. A new two-light window has been introduced in the south side of the church, and the two old windows from the south aisle have been utilised in the west and east ends of the galleries, with additional windows on each side of the tower. The whole of the new windows are filled with cathedral-tilted glass, enriched with borders of antique stained glass. This portion of the work was entrusted to Messrs. Ball & Sons, College-green, Bristol. The ventilation and heating of the edifice generally have been improved and extended. The total church accommodation is now 1,212 persons. The contractors for the general work were Messrs. Hawkins & Son, of Glastonbury, and the plans were prepared by Messrs. Price & Wooler, of Weston-super-Mare. The total cost of the enlargement is 1,600l.

**NEW SCHOOLS, SHEFFIELD.**—The foundation-stone of new schools and mission hall about to be erected in connection with the church of St. Bartholomew, Sheffield, was laid on the 25th ult. The building is to contain large kitchen, store-room, coal-places and heating-vault. On the ground-floor there will be an entrance lobby, an inner cloak-room, &c., and the boys' school, 64 ft. 6 in. long by 22 ft. 6 in. wide. In this room iron roller shutters will be placed so as to cut off, when required, a separate room, 22 ft. 6 in. long by 18 ft. wide, having a separate outer door. The upper floor will be a repetition of the room below. The total cost will be 1,500l. The architect is Mr. J. B. Mitchell Withers, F.R.I.B.A., of Sheffield. The contractors are Mr. James White (mason), Mr. W. Gee (joiner) and Mr. Mills (plumber).

**NEW WESLEYAN CHAPEL FOR WALTON.**—On the 29th ult. a new Wesleyan Chapel, which has been erected in Brook-road, Walton, was formally opened by Mr. Isaac A. Mack. The new edifice is in the Liverpool (Booth) circuit. Its total cost is about 3,700l. Accommodation is provided for 60 worshippers. The plan of the chapel includes nave and transepts. The architects are Messrs. Briggs & Wolstenholme, Liverpool and Blackburn; and the builder Mr. M'Dermott, of Liverpool and Bootle.

**NEW PUBLIC BUILDINGS FOR SOUTH STOCKTON.**—On Saturday afternoon, the 25th ult., Mr. John Steel (chairman of the South Stockton Local Board) laid the foundation-stone of new public buildings for that town. The site is close to the railway station. Mr. J. M. Garry, of West Hartlepool, is the architect of the building, and Mr. W. C. Atkinson, of Stockton, the builder.

**REVERENDS, ST. GEORGE, EASTON-IN-GORDAN, NEAR BRISTOL.**—The fine church of St. George, Easton-in-Gordano, has just received, at the hands of Mr. Henry Mirehouse, a reredos, made of polished alabaster and English marble. The work rests upon a massive reticulated of (Ipseylon Devon) variegated marble, and consists of a triple array of recessed panels, with cusped and crocketed gables all in alabaster. The heads of the arches are supported by carved capitals, resting upon serpentine (Cornish) columns. The figures are carved in high relief, and are in outline the more vividly shown by backgrounds of gold tesserae. The central group represents the birth of our Lord; those on either side contain groups of attendant angels. The work has been executed by Mr. H. Hems, of Exeter.

**A NEW CHURCH FOR LANGLEY.**—The new church of St. Michael and All Angels, at Langley, in Birmingham, was consecrated by the Bishop of Worcester on the 30th ult. The church is planned to accommodate 617 worshippers. The nave is 75 ft. long by 24 ft. wide. On the north side are the choir and clergy vestries, also an organ chamber. In the designing of the church, simple treatment in brick and stone of the so-called Gothic style of architecture has been adopted. The western gable has a four-light traceried window, with stone shafts and arches also a three-light piercing above. The east end has a triple window, with stone joints, shafts, and arches. The north and south elevations are pierced with three-light windows. Internally the piers are of



with moulded red brick arches and plastered walls. The channel has a barrelled wooden roof. The floors under the seats are laid with wooden blocks upon concrete, and the aisles with tiles. The chancel-window is composed of three lights, the work having been executed by Mr. Samuel Evans, of West Bromwich, and is the gift of Mr. A. M. Chance. The altar is above the Crucifixion of our Lord. The other figures in the group include Mary, the Mother of Jesus, St. John, and Mary Magdalene. The whole is worked upon a background of grisaille ornament. The bricks for facing have mostly been supplied by the Cakeworth Brick Company. The ornamental ceiling and moulded bricks are from the works of Messrs. King & Co., at Stourbridge. The exterior stonework is best Hollington, and the interior dressings are in Bath stone. The heating-service is by Mr. J. Grundy, of London. Mr. Cox has been clerk of the works, and the whole of the work has been carried out by Mr. T. Rowbotham, of Birmingham. The joint architects are Messrs. Osborne and Reading, of Birmingham, and Messrs. Wood and Kendrick, of West Bromwich. The contract for the erection of the church was for £7,000.

**NEW CHAPEL AT SMALL HEATH.**—The memorial stones of a Baptist chapel at Small Heath, near Birmingham, were recently laid. The site of the buildings is situated at the corner of Coventry-road and Jenkins-street, and will be occupied by an institute with committee-rooms and cloak-rooms on the ground-floor; a chapel, 74 ft. long and 50 ft. wide, and capable of holding 700 people; lobbies, vestries, and organ chamber. The frontage to Jenkins-street is occupied by a lecture-room holding 400 persons; while a caretaker's house stands at the extreme end of the site. The chapel is of a simple shape, with accommodation for the choir in an octagonal apse, and organ-chamber and vestries at the rear. The building, which will cost £8,000, is in the Gothic style of architecture, with terra-cotta facings, and is being carried out by Mr. E. Johnson, contractor, of Netchells, to the designs and under the superintendence of Messrs. Ingall & Son, architects, Birmingham.

#### SANITARY AND ENGINEERING NEWS.

**THE WATER SUPPLY OF DENBY.**—Colonel C. H. Luard, R.E., an inspector of the Local Government Board, recently resumed his inquiry, begun on August 20, at Denby National School, into an application by the Denby Local Board for sanction to borrow £6,000, for the purpose of constructing a reservoir of the capacity of 100,000 gallons, and other works, for the better supply of the district with water. Mr. G. H. Croxall, C.E., Huddersfield, gave evidence on behalf of the Board. Six bottles of water were produced as specimens of the water proposed to be taken, and by reason of its dirty colour caused a great deal of amusement. Against this, however, there were two analyses showing the water to be very good. Mr. Maudsley, Clerk to the Dewsbury and Heckmondwike Water Board, said that that Board had power to supply the district if the Denby Board would take water from them. The inquiry was then closed.

**DUNDEE WATER SUPPLY.**—On the 30th ult. the Works Committee of the Water Commission of Dundee approved of the plans and sections submitted with reference to the proposed extension and improvement of the water supply of the city, and recommended the Board to promote a Bill in the ensuing session of Parliament for power to carry out the projected works. The Commissioners propose to relay the old main in the Valley of Strathmore with stronger pipes; to double the main between Pittaville and Dundee, giving a second pipe the whole way to Lintrathen; to increase the storage capacity at Lintrathen by raising the banks, &c.; to reduce the compensation supply; and to extend the compulsory supply area so as to include Tayport, Downfield, Monifieth, and other districts. The estimated cost of the work is about £9,000.

#### STAINED GLASS AND DECORATION.

**MANCHESTER CATHEDRAL.**—At the Cathedral, Manchester, on the 27th ult., a new stained-glass window, at the west end of the north clerestory, was presented to the authorities by Mr. R. L. Monk. The window, which has been prepared by Messrs. Clayton & Bell, represents "Aaron offering the Sacrifice on the day of Atonement." **NEW WINDOVS, ST. JOHN'S CHURCH, RAMMOOR.**—A new memorial window, presented by Sir Frederick T. Mappin, Bart., has just been placed in position at the head of the chancel of St. John's Church, Rammoor. The subject represents the Crucifixion. The window contains three openings. The central panel contains a figure of the Saviour on the Cross, surrounded by ministering angels, who bear emblems of the Passion. In the left-hand panel are the Holy Women and the Virgin. In the right panel is St. John the Evangelist, the patron saint of the church, while behind him stands the faithful centurion and soldier. Below the three principal lights the artist has dealt with a supplementary

subject, representing the recumbent figure of the dead Christ in the arms of the Virgin Mother. The work has been executed by Mr. W. F. Dixon, of London.

#### FOREIGN AND COLONIAL.

**DRESDEN.**—The travelling studentship of the Saxon Royal Academy (150l. for two years) which fell to the Architectural division this year has been gained by a pupil of Professor Lipsius, Herr Theobold Hoffmann. According to the *Deutsche Bauzeitung*, the prizeman is the same who won last year's Academy medal and this spring obtained the Semper studentship. A new town hospital is to be built here; 708,000 marks, or nearly 35,400l., have already been granted by the authorities for this purpose.

**SWITZERLAND.**—The Bundesrath has passed a decree ordering the formation of a National Museum, the collections of which are to be housed in a monumental building having not less than 3,000 square metres superficial area of exhibition rooms; the site and moneys for the erection of which will be found by the canton in which it is to be situated. The Government has granted 910,000 francs and 390,000 francs respectively, for the erection of new general telegraph offices at Bern and Thun. Zurich is to have electric lighting; the Municipal Authorities have granted a credit of 2,317,000 francs for this purpose.

**ROMANIA.**—The foundation-stone of the long-planned Danube bridge at Cernavoda was laid last month, in presence of the King. This bridge, or, rather, long system of alternate bridges and viaducts (the designs for which were open to competition, 1882), will be carried out under the superintendence of the chief-engineer of Roumanian railways, Mons. A. Salgry, at a cost very close on 1,000,000l.

**COLOGNE.**—At the great fire in the machinery hall of the Military Exhibition occurred an interesting example of the fire-resisting faculties of a plaster wall on wire grounding, constructed according to the "Rabitz" system (German patent, No. 4,590), the fire (of intense heat) being kept from spreading into the adjoining division by such wall, of some 300 square metres surface and only 5 cm. thickness, so completely, that drapery hanging on the further side was not even ignited (*Deutsche Bauzeitung*). The Rabitz work has of late been much used in Germany for buildings required to be heat and fire proof. In the new Halle Theatre, the minor partitions, the floors and ceilings of the tiers, &c., are of this composition.

#### MISCELLANEOUS.

**BIRMINGHAM LAW COURTS.**—In referring to this building last week, we wrote by a slip of the pen "Yorkshire stone" for "Portland stone" as the flooring of the great hall. It is Portland in 8 in. slabs.

**THE LONGFORD PICTURES.**—The *Portfolio* publishes a reproduction of the Holbein recently added to the National, the identity of the portraits in which has been so much discussed recently.

**WORKMEN'S DWELLINGS: THE GUINNESS TRUST.**—It is stated in the *Daily Chronicle* that the trustees of this fund have already begun operations upon three of the four sites which it is expected will be included within their scheme to provide for a total of 1,000 families, or, say, 5,000 persons. Lord Cadogan has conveyed, upon generous terms, a plot in the Marlborough-road, Chelsea, whereon eight separate blocks will be erected, after the designs of Mr. Macartney, architect. Mr. Pilkington is the architect for a group of dwellings in the Bethnal-green district, where has been acquired the site of some condemned and already vacated buildings at the junction of Hackney-road and Columbus-road, being a triangular-shaped piece of ground about 3,750 yards superficial, and capacious enough to admit of an inner courtyard, to be planted with trees and shrubs. Mr. N. S. Joseph, architect of the industrial dwellings in Brady-street, Whitechapel, has furnished designs for the Artisans' street, Walworth, site, which is 80 by 20 yards superficial, and in the midst of a very large working population. We gather that this provision of accommodation does not involve the disturbance of existing residents. We may add that, according to a return made just twelve months ago for the London County Council, the various Artisans' Dwellings schemes under Cross's Acts have cost a total sum of 1,849,103l., of which amount 1,517,555l. was paid "for compensation," 27,066 persons being re-housed for 25,217 displaced.

**THE CITY AND SOUTH LONDON ELECTRIC RAILWAY.**—extending from King William-street to Stockwell, was opened on Tuesday by the Prince of Wales. We will say something about it next week.

**LIGHTING-CONDUCTORS.**—For the convenience of London clients, Mr. Joseph Blackburn, of Nottingham, has opened an office at 2, Norfolk-street, Strand.

**WATER SUPPLY OF ST. PETERSBURG.**—According to a recent report by the British Consul at St. Petersburg, the Russian Waterworks Company long resisted all demands for filtering the water of the Neva before delivery for consumption, a necessary measure owing to the growing impurity of the water, through its pollution at and above the portion of the river from which it was supplied. After much delay the company was obliged to construct filters, through which the water passes before entering the system of pipes. The filtering-beds are on a very large scale, the main one covering 14,000 and the smaller one 6,800 square yards. Together they are capable of supplying 32,484,000 gallons a day. The filter-beds, three feet thick, consist of layers of fine sand, gravel, rubble, and cobble stones, the two latter materials being placed at the bottom. Three feet of earth, covering the top of the filtering vault, secures the water against frost in winter and heat in summer. The water first enters several small feed pipes extending into the river, thence it flows naturally into a reservoir, 46 ft. 8 in. long, 5 ft. wide, and 18 ft. deep, situate in the main pumping station close to the river bank. From this the water is pumped into an iron tank, 105 ft. long, 4 ft. wide, and 4 ft. deep, from which it runs out through 110 apertures protected with very fine brass sieves placed in an inclined position over the apertures. Passing through these sieves, the water, now considerably free from earthy and other extraneous matter, enters into a basin arranged on both sides of the large reservoir. From this the water is conducted into the above-named filters, situate underground and divided into several compartments, having the appearance of vaulted chambers. The cost of construction of the filtering tanks amounted to 191,379l.

**TREE-PLANTING.**—At a meeting of the Vestry of St. Marylebone on the 30th ult., a further communication was received from the Metropolitan Public Gardens Association as to their offer to contribute conditionally the sum of 100l. towards the expense of planting trees in the thoroughfares of the parish. Mr. Harris, as Chairman of the Works Committee, recommended that the offer be again declined. The trees would cost between 4l. and 5l. each, and how many would they get for 100l.? He quite agreed that Portland-place would make a splendid boulevard if planted with trees, but thought they should do the work themselves. Mr. Lewis contended that the ratayers should be consulted on the question, and Mr. Emery said that planting trees meant shutting out air, light, and sunshine. After some further discussion the debate was adjourned.

**UNDERGROUND PIPES AND WIRES.**—At a meeting of the Strand Board of Works on the 30th ult. Mr. Emden's proposal respecting the subway being made for the storing of the pipes and wires of the gas, water, and electric light companies was discussed, and the matter was referred to the Works and Parliamentary Committee with a view to united action being taken. A memorial will be promoted by all the districts in London to induce the County Council to bring a Bill into Parliament dealing with the subject.

**ARCHITECTURAL PARTNERSHIP.**—Mr. William Dawes, architect, of London and Manchester, has taken Mr. Francis Fraser Heyland into partnership, and the style of the firm will in future be "Dawes & Heyland."

**LIVERPOOL ENGINEERING SOCIETY.**—The first ordinary meeting of the session of the Liverpool Engineering Society was held on the 29th ult. in the Royal Institution. Mr. Ferdinand Hudleston, the new President, delivered the inaugural address, and dealt with the growth of the Liverpool dock estate, viewed from an engineer's point of view, which, he said, was the most complete dock estate in the world. In his concluding remarks, the president said the two bugbears of the Mersey were the Pluckington Bank and the Bar. The Pluckington Bank would continue to be a nuisance until Traamore Ferry and Dingle Bank had walls built across them to strengthen the flow of the ebb tide. The size and shape of the bank, however, must always depend very much upon the condition of the low water channel in the upper estuary. He did not think that the Ship Canal works would affect the wanderings of the channel, and thought that the works which were being done in connexion with the bar were satisfactory. In his opinion, training walls might perhaps ruin Liverpool as a port, and kill the trade of Lancashire.

**GLAZING.**—We understand that Messrs. Shelley & Co., of 55, Lionel-street, Birmingham, have obtained a three years' contract from H. M. War Office for supplying and fixing their patent "Unique" glazing in the Royal Arsenal and Dockyard, Woolwich; Royal Gunpowder Factory and Buildings, Quinton-hill, Waltham Abbey; Royal Small Arms Factory, Enfield Lock; and other Government establishments in England.

**KING'S COLLEGE.**—The annual prize of 5l. given by the Clothworkers' Company for proficiency in mechanical engineering has been awarded this year to Loveridge Frank Potter, son of Mr. W. F. Potter, architect.



## CONTRACTS.—Continued.

Those marked with an Asterisk (\*) are advertised in this Number. Contracts, pp. iv, and vi. Public Appointments, p. xviii.

ESTATE EXCHANGE REPORT.

OCTOBER 27.—By C. Slee & Son: 75, Lennox-rd., Finsbury Pk., to 75 yrs., g.r. 61, r. 40L, 2904; 32, Dewhurst-rd., Hammersmith, to 91 yrs., g.r. 61, 108, 4000; 42, 43, and 44, Hall-st., City-rd., to 52 yrs., g.r. 147, r. 1168; 1, 1707, f. residence, "Hawthorne," Bushey, near Wat. ford, r. 367, 5304; the adjoining house, "Fernleigh," r. 371, 5201.—By Venton, Bull, & Cooper: f.g.r. of St. with reversion in 83 yrs. Walthamstow, 1804.—By J. A. Trygghall: 41 to 44, Foster-rd., West Croydon, to 74









# The Builder.

Vol. LIX. No. 2495.

SATURDAY, NOV. 16, 1890

## ILLUSTRATIONS.

St. George's Church, Newcastle-on-Tyne.—Mr. T. E. Spence, Architect :—	Double-Page Ink-Photo.
Interior View, showing general scheme of Chancel Decoration .....	Double-Page Ink-Photo.
Details of Chancel Decoration .....	Single-Page Ink-Photo.
Students' Club at Erlangen, Bavaria.—Herr Theodor Eyrich, Architect .....	Single-Page Ink-Photo.
Restored Front of Schwarzenberg Castle, Franconia.—Herr Theodor Eyrich, Architect .....	Single-Page Photo-Litho.
New Lodges, Park Hatch, Godalming.—Mr. E. L. Lutyens, Architect .....	Single-Page Photo-Litho.
Schools at Harlesden.—Mr. J. Martin Brooks, Architect .....	Single-Page Photo-Litho.

## Blocks in Text.

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### A Review of the Birmingham Art Congress.



THE weakness of an Art Congress, as compared with a scientific one, of course lies in the fact that art is really concerned with producing original works and not with inquiring into facts about existing phenomena. Science is necessarily progressive, and has newly-discovered facts to impart at each periodical meeting; art is not necessarily progressive (though many critics in the present day seem to think it is), and papers on artistic subjects, unless when they are concerned with imparting either historical records as to past epochs of art, or technical information as to modes of working, are necessarily of a critical order, and deal in the discussion of opinions and principles. That art-criticism is not art so one knows better than some of the eminent artists who read papers at the Congress; and it is quite true, as has been more than once observed in connexion with the subject, that if art were in a healthy and flourishing state among us, art congresses would be quite uncalled for and probably would never be thought of. In this country, unfortunately, the public indifference to all art except mere picture painting, and the want even of any perception of what it means, is so deplorably evidenced both in private life and in the utterances of the newspapers which best represent average public opinion, that some special effort is certainly needed to open the eyes of the English public and to rouse them from their state of torpor and indifference in regard to the artistic side of life. The annual Art Congress may in time do something towards this end, may succeed in arousing public attention and public enthusiasm for art in this country, though it will take a good many years first, more especially as the daily press of the country does nothing to help the movement, but rather everything to prejudice it, by insufficient and incorrect reporting, and often by apparently utterly wanton misrepresentation.

If essays on art are not art, there are at all events good and bad essays, and the Bir-

mingham Congress has shown a remarkable predominance of the good. We do not know that much will be done for art by such papers as Mr. Brett's attacks upon all other painters, ancient and modern; and though there is no doubt a considerable amount of amusement to be got out of such a performance at the time, it will be better for the dignity of the Art Association if that kind of paper were suppressed for the future. But taken as a whole, the collection of papers read at the Birmingham Congress is really a very remarkable one; remarkable not only for the eloquence and the critical insight of many of them, but for the tone of moderation and practical common sense which pervaded nearly all of them. At the first Congress at Liverpool there was a certain proportion of papers in which "sentiment" of a very florid description was predominant. This element seems to have fortunately disappeared, and the proceedings of the Birmingham Congress, when fully published, will show that it is possible for artists who are enthusiastic in their calling to discuss it with judgment and logical reasoning.

This practical and commonsense element is nowhere better exhibited than in the address delivered by Mr. J. E. Hodgson as President of the Congress; and in this connexion we may heartily congratulate the Association on the fact that they have discarded the idea of having ornamental presidents, selected for the possession of a title or of social position or influence, and have selected an artist as the proper person to preside over an art congress: a principle which we are glad to hear is to be acted on for the future. No one could have filled the post more ably than Mr. Hodgson, whose address was a model of good sense expressed in a pointed and original manner. He deprecated any idea that the Art Association expected to alter men's ways of thinking, to change the face of society, or to bring about an art era equal to that of Pericles or Leo X. The object was to elicit public opinion, and to consider how to clear away obstacles from the path of the artist, and provide him with occupation worthy of his powers. "There is," he said "artistic talent enough in this country, and it is surely a useful thing for the community at large to meet together as we have done, and to consult together how that talent can be most

profitably employed." Nor is Mr. Hodgson among those artists who regard the great practical works of the day with indifference or dislike. His remarks on this point are worth quotation, as coming from a painter:—

"It is quite natural and excusable if we have failed in this matter [viz.: the rendering of great beautiful] when called upon to make things unknown in the world before, such as a locomotive engine and a Forth Bridge; and indeed it seems questionable to my mind how far such things can be made beautiful. There is an inexorable law in their constitution which compels them to go one way and no other. It was a tremendous problem in science to span the river Forth, and to suspend a roadway over it; and the form the bridge took was probably as necessary for the solution of that problem as the form of the Pons Asinorum of Euclid. I cannot, therefore, at all sympathise with those who anatomise that wonderful structure for its ugliness. The effect it produces on my mind is a sensation of immense power, of a splendid human triumph over materials, which gives me as much pleasure as does a sensation of beauty. It is narrow-minded and unworthy of our vaunted progress to ask for the same thing everywhere and in every place. A factory, with its straight brick walls, its hundred windows all alike, and its tall chimney belching forth volumes of black smoke, is an unsightly thing, no doubt; but the idea of which it is the visible embodiment is a great one, and thrills the imagination. It is ugly in itself, but it is a cause of beauty; it is helping to spread civilisation and comfort in far-away countries; its ugliness is a necessary evil that much good may come to humanity at large."

How far more wise and reasonable is this attitude of mind as compared with the prolonged shriek of indignation which Ruskin has uttered, in one form or another, against every production of the manufacturing and engineering work of the day. The object which we should keep before us now, in Mr. Hodgson's view, is the cultivation of the power of design. "A pennyworth of beauty often turns the scale;" but we cannot get the artists who will provide this beauty by any such system as the immense machinery of the Department of Science and Art. If five or six youths with a genius for design were to appear in the Art Schools of Birmingham, he considers they would be no better as far as Government encouragement was concerned. "Local masters are able to discern talent in their pupils, and though they may discern talent of a high order, and especially suited to the locality in which they are placed, under the present



administration they have no means of encouraging it; that must be done by others than the heads of the department. This is no fault of any one's; it must be so as things are now administered. There is no other way, the scheme is too complex to admit of special deviations, no hitch must occur anywhere, lest the whole machinery be thrown out of gear. The only way we can bring our art schools in touch with our manufacturing industry is by decentralising. In all provincial schools should be taught the elements and principles of design, with special reference to local needs."

To understand the special bearing of this remark it should be observed that it had been arranged that this year the subject of Art Education, both for artists and the public, should be as far as possible the central idea of the Congress. This is the keynote of the admirable address by Mr. T. G. Jackson, as President of the Architecture Section, which we have printed in full in this week's and last week's issue, and of other papers in connexion with architectural training read by Mr. Astor Webb, Mr. Ralph Nevill, and Mr. R. T. Blomfield. The most important points in Mr. Jackson's address, as in opposition to the commonly received notions in regard to the architect's profession, are his caution against the use of drawing as an end in itself rather than a means, and the objection raised to the combination of the profession of architect and surveyor. In regard to drawing, it will be seen that Mr. Jackson does not deny the artistic interest of drawings of architecture made for the purpose of artistic effect, but he objects, and with reason, against the waste of time in elaborating elevations the real object of which should beonly to represent the facts of the buildings so as to facilitate its correct execution. As far as this is concerned with what are called working drawings we are quite of the same mind. To proceed further in elaboration than is necessary for the execution of the building—to draw out in detail a number of windows, for instance, which are exactly similar, is abstracting valuable time which might be far better employed in some other manner; in giving more careful consideration, for instance, to the study of detail. We do not agree, however, in finding no artistic interest in a beautifully-drawn elevation. It does not show, certainly, what the building can ever look like in execution, but it shows what the building actually is, when compared with sufficient profile delineations in plan and section; and we confess to finding a great pleasure in the contemplation of the beautiful coloured elevations which the French architects, for instance, produce for the Commission des Monuments Historiques. A perspective view executed with the same accuracy and finish would not have the same value as a record of the building; it not only is capable of being cooked in various ways, but with the best intentions of accuracy it is likely to convey a more or less inaccurate impression. The coloured elevation conveys the colour and (when properly treated) the texture of the building, and places the facts as to size and proportion of parts with trustworthy correctness, because it can be checked by measurement, which cannot be done with a perspective view, except in a very general and comparative manner. This of course is a question of the illustration of architecture, not of drawings made for working purposes.

Again, in the illustration of modern works of architecture, we cannot but think that there is much to be said for the French system of exhibiting large geometrical elevations, with plans and sections, in exhibitions which include architecture, rather than the charming perspective pictures which many of our architects make for the Architectural Room at the Royal Academy. It is quite true that these elevations do not show the effect of the building, and that the pictures are much more interesting to the general public. But in a general exhibition architectural drawings such as these are quite on a different footing from the pictures properly so called; the architect in an exhibition does not, like the painter,

show his work, but a representation of his work; and the geometrical drawings of the French are in reality a much more faithful representation of this work than the perspective drawing. The latter shows the work not so much as it is, but as the architect wishes the spectator to think it is; and it is a fact that many drawings in the Academy are so got up as to give to the building represented a picturesqueness and vivacity of effect of which the real building, if seen afterwards, will be found sometimes to be remarkably destitute. Imaginary effects of light and shadow, texture and colour, are got up to give apparent poetry and picturesqueness to a building which has little of these qualities in reality; in fact we have long been of opinion that a really artistic perspective draughtsman can make a pleasing picture out of almost any building. The French system of geometrical drawing for exhibitions, on the other hand, makes no pretence of bringing the architectural drawings into the same category as the pictorial portions of the exhibition; it is tacitly recognised that the exhibition of architectural drawings stands on a different footing from the other pictures. An architect has produced a building which has architectural merit; he cannot bring the building itself for exhibition, but he brings a set of drawings which, discreetly examined and studied, show exactly what it is that he has done, and enable the competent spectator to picture it in his mind's eye on the basis of a really accurate analysis in drawing, not on that of a possibly deceptive perspective sketch in water-colour. In France it would seem, from the large space given to such analytical drawings in the annual Salons, that the artists who are not architects, who are concerned in the selection of works, recognise this fact; in England it seems they do not. A suggestion in favour of more geometrical drawings in the Royal Academy Architectural Room was made by an architect in the discussion on Mr. Bidlake's paper on Architectural Drawing at the Art Congress, but a R.A. painter who was present repudiated the idea, and especially said that he would like to keep out all drawings which showed the mark of the ruler. This merely shows a misconception of the object of such architectural drawing, which is not to show a view of the building, but to show what the building is in the way in which analytical drawing can show it; and we are still of the same mind, that there is too little of such drawing in the Royal Academy Architectural Room, and that the French collections of geometrical drawings are of more interest and of much more value to the student of architecture than mere pictures of the buildings.

Mr. Jackson's plain question "What can be more foreign to architecture than the valuation of building land, the letting of ground on building leases, the decision of questions of light and air," &c., will no doubt arouse wrath and contempt in the minds of many a respectable and successful "architect and surveyor" who is making a comfortable living out of the combined professions. But is it not the truth? Is there really any connexion between designing a fine building and estimating the market value of the land it stands upon? The fact is that "solicitor and surveyor," would seem a far more rational compound than "architect and surveyor," if we are to regard architecture as an art, and if we use the term "surveyor" in the wide sense in which it is now generally used, as indicating a man who is skilled in questions of the value of landed and house property, and of rights of light and "dilapidations." The art of surveying in the technical and strict sense, the art of geodesy, we do not hold to be in any way in opposition to the work of architecture proper; it is a very fascinating pursuit, in fact, and every architect, let him be as artistic as he pleases, should be able to use the theodolite and level: an art easily acquired with no great expendi-

ture of time. But questions of the valuation of property, and of rights of light, really can only be adequately dealt with by those who have made a special study of them, and have long experience to add to that; they often concern the settlement of very large claims, and no wise man would entrust his interests in such matters except to a person specially skilled in them. Now, life being short, it must inevitably be the case that any "architect and surveyor" who possesses this special knowledge in such subjects cannot have given much of his time and intellect to the study of design; he has had no time for it, and the two kinds of study are in themselves almost incompatible. Hence, when this man of the dual profession is entrusted with a building to design, he simply falls back upon stock-in-trade commonplaces, and can produce no architecture worth the name. So emphatically is this the case that it would not be difficult to discriminate by mere style, in any given collection or street of buildings, those which had been designed by an architect and those which had been designed by an "architect and surveyor."

It may be a question, however, whether the ground taken in Mr. Blomfield's bright and enthusiastic paper, before referred to, that an architect should be above all a modeller, a sculptor, and that we can never have any fine architecture until that is the case, is not going too far in the other direction, and forgetting the basis of architectural art. This view received a probably unexpected caution and criticism in Mr. W. B. Richmond's address as President of the Painting Section, and which, coming at the close of the Congress, was made to a certain extent a summary of its whole tendencies. As coming from a painter this address was a surprise, an agreeable surprise, in several of its points, as indicating a breadth of view in regard to art generally which certainly does not always characterise the lucubrations of painters, who are somewhat apt to regard other branches of art as of little interest in comparison with their own. Mr. Richmond is not a painter of this type, and his remarks on architecture are admirably put, and are worth the serious consideration of architects. Taking the three necessities of architecture as put by Vitruvius—"Stabilitas, Utilitas, Venustas,"—he draws attention to the significant order in which these three qualities are placed by Vitruvius, which he is disposed to accept as the right one. The following passage from the address is certainly very well put:—

"In the whole range of the vast field of architecture there is, I think, nothing more striking than the unadorned simplicity of a Doric temple; even as we see them now, the temples in Greece, in Sicily, and elsewhere, without their sculpture, without their colour, how impressive are their proportions, and how purely are they examples of the master builder's art."

It has been my good fortune to visit nearly all the Doric temples in Europe, and I confess to the growing belief that for pure architecture,—and by that I mean the art of building without adornment, delightfully and nobly,—those ancient temples must still be our guides. What other buildings would remain such complete works of art as these do, if robbed of all the sculptors, the painters, the carvers, the copper and silver smiths, the blacksmiths, and the carpenters' arts have enriched them with? Surely, then, the foundation of all architectural teaching should be of structure and proportions, ornament should be a very after consideration. Like music, architecture is a perfectly pure art,—purely abstract, purely creative. It is not till the sculptor wakens her with the sound of his chisel and mallet, and the painter touches her with colour, reminding us, by their playful and fanciful rendering, of the adornment of nature's hands upon her stones, that architecture begins her close relationship to her sister arts. Till then she stands by herself, like the bare mountains, unadorned by man.

Yet this, her special gift, her unadorned simplicity, and complete individual majesty, is too often forgotten. Too often do we mar her beauty by the vestments with which we clothe her natural simplicity. Division of her labours is therefore necessary to the architects; they should leave to the sculptors and to the painters those adornments which they know more about than do the architects."

This is a good counterblast (though not so intended) to the view of architecture often

\* Such drawings cannot be accurately made without a ruler, any more than a wall can be accurately built without a plumb-line.



taken by sculptors, who will cite these very buildings and say "What is a Greek temple with the sculpture removed?" A foolish kind of criticism which Ruskin started. But it is perhaps as well for the too enthusiastic architect to be reminded that to excel in three arts is not given to every one, and that after all it is possible to "build nobly" (the real end of architecture) without being a painter and sculptor at the same time; though we quite agree that if an architect has had the time and the talent to acquire the power of modelling his own carved ornament, he will be able to give far more artistic unity and life to his building. But to say that there can be no refined and interesting architecture without this is going a little further than the truth will bear.

Mr. Ralph Nevill's paper on the "importance of the Field Study of Architecture," the title of which did not exactly convey its meaning, was a very well-urged plea for the advantage of getting students of local art schools to study and sketch local architecture as represented in picturesque old buildings, not necessarily large or important, in the locality; old farm-houses and other buildings which have quietly picturesque beauty and something of a vernacular style, a style of the district. Mr. Nevill's main object in suggesting this was to infuse some feeling for architectural detail, of a simple and unobtrusive kind, into the mind and taste of the kind of men who might become builders, builders' foremen, or clerks of works; to foster in them such a refinement of taste and such a perception of local style that they could be trusted to assist in working it out for themselves in taking their own part in the erection of a building. To get at established builders, Mr. Nevill admits, is probably hopeless, but it may be possible to get at the builders' sons or destined successors. This is an excellent idea, to provide a class of men engaged in working on buildings, who should be not merely blindly doing what was put before them in detail drawings, but sympathising with the spirit in which the work was to be carried out, and bringing their own taste to bear on the execution of the work. It would make a difference often in the final effect of a building if there were this sympathy and understanding on the part of the workmen engaged on it; but what is perhaps of even more importance, it would raise their work from a dry and dull task to an occupation of interest. It is to be hoped this suggestion will not be lost sight of by the masters of local art schools.

The subject of architectural education was touched on from another side in the paper by Mr. Aston Webb, on the Education of Architects, which the author was unfortunately prevented by illness from reading himself, but which was read for him. This was a paper in favour of the examination scheme of the Institute of Architects, but which Mr. Webb desired to see united with the teaching of the Royal Academy Schools. Mr. Jackson has taken to task the Institute for not being an educating body, and says very truly that examination is not education, and we quite concur with him in desiring that young architects should not be led into thinking that the great object of their study was to pass a brilliant examination. At the same time, as we have said before, we do not see how the Institute can become a teaching body without its entire reconstitution; it was not created with that object, and has no means or machinery for it. As to its examination, we consider that an excellent institution, as a preventive measure, but not further than that. It provides an assurance that everyone who has passed it has a certain definite amount of practical and scientific knowledge, that amount without which he ought not on practical grounds to be entrusted with buildings; but it should be recognised that this is not to be understood as "hall-marking" him as a superior architect, only as a man who has given proof of possessing adequate practical knowledge. The examination is distinctly likely to raise the status of those who enter the Institute ranks, and to keep

unfit men out; but it can only have a negative object; the qualities which render a man really a great architect can never be tested by examination. The public must find them out as it finds out eminent sculptors or painters.

Mr. Mackmurdo's address as President of the Applied Art section was supplemented, in a most piquant and practical manner, by the production of some examples of Birmingham wares made for exportation to various parts of the world where there was a half-civilised coloured population, in contrast with the more costly and gewgaw articles made for home consumption. Mr. Mackmurdo produced two copper jugs of simple design and in perfectly good taste, which he found getting made in the back rooms of an establishment the show-room of which was filled with things that no artist would endure. He was told he could not buy these except wholesale, they were for exportation for negroes and were not for sale in Birmingham, as not being good enough for the reputation of the firm! There could hardly be a better lesson on the point that ornament is not necessarily art. Here was a firm making really artistic objects in its back work-rooms which the owners were ashamed of showing, and which they sent abroad as just good enough for negroes, while they offered bad ornament to their local customers.

In connexion with this section of the Congress a visit to some of the Birmingham manufacturers engaged more especially in works of art was organised on the part of some of the members specially interested in applied art; but time only allowed of two or three large firms being visited, where the members were very cordially received. One of these was a large goldsmith and jewellery establishment where there was an evident desire to have any hints that the visitors could offer, and where some designs made in the house were shown (on paper) which were above the average of such design as turned out from commercial establishments. There was more of hand work and less of machine work than was expected, but the party were told that the firm in question was exceptional in this respect. It was a somewhat sad sight, however, to observe the wholesale manufacture going on of a couple of designs for brooches, the shape of which exactly suggested a finger-plate for a door on a small scale, and suggested nothing else. The work was being carefully and conscientiously done, but what a pity that the workers had not something more beautiful to exercise their craft on. The more issue of things by the gross on the same pattern takes away all sense of Art, more especially when one goes behind the scenes and sees the process going on: still, as Mr. Richmond had the courage to say in his address, we perhaps cannot do altogether without machine-produced ornament for some purposes; the point is to endeavour to get something good to produce. It is impossible to suppose that anyone could have had any interest or enjoyment in producing these "finger-plate" brooches.

A few other papers we can only mention incidentally. Mr. Simonds's address as President of the Sculpture section was a very well-written one and very well delivered, but adopted again the exaggerated view of the necessary relation between sculpture and architecture. It is quite a mistake to urge that sculpture necessarily loses half its effect apart from architecture; the highest works of sculpture not only can afford to stand alone, but would even lose some of their complete and all-round character if compelled to form part of a building. It is the architecture which inevitably gains by the alliance; the sculpture must almost of necessity lose something by being conventionalised into harmony with the architecture, though it gains in another sense no doubt. In short, there is no absolute principle in the matter: bas-relief, of course, is necessarily in connexion with architecture; but group sculpture in the round is not, and the sculptor would often be hampered in his conception and design by being compelled to adapt his group to a special position on a

building. It is surprising that sculptors themselves (or some of them) cannot see this.

Mr. Mullins's paper on "Sculpture as applied to Internal Decoration" dealt of course entirely with sculpture in the bas-relief form, or as applied to objects of furniture &c., and was a very good plea for decorative use of the figure in this manner. Mr. Selwyn Image, in speaking of "Colour in relation to internal decoration," was strictly practical in tone, and gave some very valuable hints as to the means of procuring good colour effect in interiors without extravagant expenditure. An exceedingly sensible and practical paper that read by Mr. F. G. Jackson on "Art Education in Relation to the Industries," the main point of which was that considering the short time many of our art students remain in the schools, it was important that a system of drawing should be adopted which would give the eye and hand as much training as possible in the allotted time; and to this end he recommended greater attention to drawing with the brush. The following passage from his paper is worth quoting:—

"Having had a lengthened experience of the (South Kensington) system, both as a student and teacher, and an intimate acquaintance with some of the important manufactures of the district, I may be allowed to speak as to its working and its direct bearing upon the industries, and point out what appear to be practical defects. First, then, one conclusion has been forced upon me, that there is throughout a too great insistence upon rigid outline drawing. Outline drawing, or, as it is technically called, freehand drawing, was no doubt instituted as a protest against the slipshod drawing prevailing before the system was promulgated, and to encourage accuracy and care; so far, it served its purpose. The practice of outline is an essential part of a pupil's training, but the manner in which it is taught, and the extent to which it is carried on, may hinder his progress. The so-called freehand drawing, as pursued in schools generally, might be more appropriately called stiffhand drawing, as the method of teaching engenders anything but the free use of the pencil, leading rather to timid, laboured, and inexpressive outline. The attention is directed towards the production of mechanically finished outline to the neglect of the realisation of the form the outline is intended to define. This undue attention to line, resulting in the neglect of *forma* in the preliminary stages, is more painfully noticeable in subsequent ones, such as outline from the cast and from plants. The timid, halting, and laboured attempts one sees from time to time in these exercises cause one to think that there is something wrong in our methods, and this I believe to be the case. Drawing is not generally taught in a sufficiently direct way, and the practice is limited to the use of a hard point alone. As regards the first, I think if drawing was taught more after the manner that writing is, distinct advantages would result; probably the early exercises would be as bad as those of first copy-books, and would not be so presentable as the first laboured drawings under the existing method; but that would be of no consequence so long as we have in view, as we ought to have, the development of executive power as a means of expressing form, rather than the making of drawings. Power is to be obtained by repeated well-directed efforts rather than by laboured attempts to get perfection in a few."

This is just the same complaint, essentially, that we and others have before made against the system of learning to draw the figure by stippling shadows on one drawing for weeks, instead of making a number of less highly finished studies from different positions.


Mr. Heywood Sumner's paper on "Advertisement as a field for design" was an admirable one, but the artistic element in advertisements can only be introduced by the cultivation of public opinion, which probably will slowly work a change in this respect. If an advertisement is offensive to public morals it can be dealt with by the law, as we have recently had occasion to know; but it is impossible to apply any law against ugly advertisements, because it is impossible to draw any defined line between the ugly and the not-ugly. Public opinion must do it, and every one interested in the subject should take every reasonable means to awaken and stimulate public opinion to put down this mass of staring vulgarities which overruns our streets on all sides, and perpetually accustoms the eyes of the multitude to the contemplation of ugliness and vulgarity. Taxing advertisements according to area,



which was suggested, might have some influence in at all events reducing the nuisance within narrower limits.

Among papers of a more philosophic and general turn may be named Mr. Hodgson's charming lecture to working men on "Open Sesame; or, how to unlock the Treasure House;" a lecture of advice as to the best way of cultivating the mind by such reading as the daily labour leaves time for, and which is remarkable not only for its sound sense but for the kindness and sympathy which runs through it. And last we must mention the remarkable paper by Mr. Holiday on "The Figure in Design," which turned out to be not, as was expected, a lecture on designing the figure, but on the mental reasons why the figure is the highest and most expressive thing in art. The aim was to give a reason, on the basis of Evolution, for the mysterious effect of beauty produced on us by nature, as the environment with which we had been harmonised, and by the figure as nature's climax. "The delight which every true artist and every lover of art must feel in the beauty of the human form, is precisely similar in its origin to that aroused by the sky and the water, the mountains and trees, both being derived from the harmonies exhibited in the things contemplated, and the harmony between them and our own nature; but though similar in origin, it is far more intense in degree, objectively because of the greater perfection and subtlety of its harmonies, subjectively because of its more intimate relation with our spiritual faculties." This gives the outline of the main idea of the paper, which was very fully and eloquently worked out. We do not remember before to have met with any such distinct attempt to give a reason, founded on the nature of things, for the supremacy of the figure as a mode of artistic expression, though of course it has been tacitly accepted as such for generations. It may be said that such a paper has no practical influence on art, but it may have, if read and understood, a very practical influence on public comprehension of art; at all events it was a most eloquent and thoughtful paper, and was listened to with almost breathless attention by a delighted audience.

#### NOTES.

 E entirely concur in the opinion already expressed in the *Times*, that the dreadful railway accident (?) at Norton Fitzwarren is morally chargeable upon the railway company who apparently sanction the arrangement of shunting goods trains at a place where there are no sidings, and leaving a heavy goods train waiting on the main line. As far as can be at present understood, the signalman in charge was an exceptionally good and steady man who had been on the line over thirty years. He appears to have forgotten the waiting goods train at the moment, and though it seems an extraordinary piece of forgetfulness, it has to be remembered that the human brain is not an automatic machine, and it is impossible that it can always be counted upon to act as one. The essential fault is that any train intended for the down road should have been shunted on to the up road and left to stand there at a time when a fast train was nearly due. Such a proceeding is, in view of the fearful risk that is run, little short of criminal; but unfortunately criminality cannot be brought home to companies in any adequate or practical manner.

WE observe that Dr. Orme Dudfield's last monthly report on the sanitary condition of Kensington entirely confirms the opinion we had already expressed in regard to the recent sensational correspondence about smells in London, that these smells were the result of brick-making works at Hammersmith, and not of defects in drainage and sewer ventilation. All the reasonable evidence pointed in that direction, and it is satisfactory to find it confirmed on such

reliable authority. Dr. Dudfield had long recommended that brick-burning nuisance should be the subject of legislation, either special or under existing Acts dealing with noxious trades, and he draws attention to and quotes the by-laws which have recently been recommended by the County Council, and now wait the sanction of the Local Government Board, for controlling this nuisance. Dr. Dudfield adds the following practical comment on the situation:—

"Should the by-laws be confirmed by the Local Government Board, it will be interesting to note the result. Of course, nothing can come of them, should the Sanitary Authorities of the districts where brickmaking is carried on neglect to put them into force; unless, indeed, the Council, or private individuals subjected to annoyances, should take the matter into their own hands. To us, locally, the by-laws will not, probably, give entire relief, as there can be no doubt that the stinks arise, in part, in the western district outside the Metropolitan area, e.g., at Acton, to which the by-laws would be inapplicable. But as regards brick-burning in Hammersmith, I should not be surprised if it were brought to an end, at any rate, so far as the "clamp" system is concerned; for it would appear impossible that brick-burning can be carried on under that system, without generating 'noxious effluvia,' that must 'escape' into the atmosphere, where, it being impossible, moreover, to prevent the production of such effluvia when dust-bin refuse is used in the making or in the burning of bricks, and alike impossible that such effluvia should be 'effectually arrested or destroyed,' as required by the by-laws."

THE great scheme of "General" Booth, which has aroused so much enthusiasm, is no new idea, and like many other schemes for benefiting the homes and condition of the poorer classes, will be found to have been suggested years before in our columns. In 1871, the then Editor of this journal was commissioned by a wealthy man, whose name was not divulged, to invite suggestions for the best manner of expending half a million of money for the public good, while avoiding pauperisation. The announcement brought a number of suggestions, the best and most reasonable of which were published in the *Builder* for April 15, April 22, and May 6, 1871. Among these is a short statement of a scheme, (May 6, p. 341) under the signature "R. P." which is substantially the same as that now being offered for public consideration. It runs as follows:

#### "Home Colonisation."

This can be done by purchasing a portion of the common lands of England, and forming a colony, where men who have been reduced through want of employment could be sent to reclaim the land and renew their strength. On each ten or twenty acres of land could be built a small homestead. In the erection of these the skilled labour could be employed; and when the whole was reclaimed and made productive it should be let or sold, and more land purchased with the proceeds.

In connexion with this colony should be a city colony, for the reception of all men willing to work, but so reduced in circumstances that their appearance and strength prevent their obtaining work. These should be drafted to the country colony as required, and when their health was recruited sent back. Donations might be invited from the general public, for loans to the wives and children, if any, to support them during the absence of the husbands; but in all cases the husband should be sent away to recruit his strength.

This is the outline of the scheme for improving the country and the people, and it could be extended so as to embrace the rebuilding of the worst parts of large cities by judicious purchases and by working parties or pioneers from the country colony."

THE attention of all tradesmen who are in the habit of using dangerously inflammable substances in their daily occupation ought to be called to the coroner's jury verdict on the recent fire at Messrs. Rowley & Brock's establishment in the City. The jury found that the fire was caused by accident, but that "the employers were deserving of severe censure for the dangerous manner in which their business was conducted." This verdict has been clenched, so to speak, by a summons against the employers, under the authority of the London County Council, for keeping petroleum on the premises without a licence, and Messrs. Rowley & Brock have

been fined 20*l.*; which it is hoped will be a caution to others not to evade the law in regard to dangerous substances of this class.

WE hear that the German Government intends bringing before the public a valuable publication under the title "Olympia: Results of the Excavations made under superintendence, &c., of the German Empire," and that the task of compiling this work has been given to Professors Ernst Curtius and F. Adler. The first two parts, "History of the Excavations," and "History of Olympia," will be from the pen of Herr Curtius; Herr Adler will work out the part describing the destruction and loss of the remains found; and will at the same time, together with his son-in-law Dr. Dörpfeld, and others, compile the descriptions of the architectural parts discovered; whilst the description of the sculpture will be taken in hand by Herr Georg Treu, and the bronzes will be described by Herr Furtwängler. The publishers of these official volumes, which are to be well illustrated, and will have a good supply of maps attached, will be Asher & Co., Berlin. The price is stated at 1,200 marks (or nearly 60*l.*). The part treating of the bronzes will be the first put into print.

A CORRESPONDENT in Birmingham draws our attention to what we had already noticed, that we were in error in ascribing to the Birmingham Town Hall the true architectural treatment which its exterior suggests viz.: a basement story of offices with a *piano nobile* above. It is many years since we were inside the Hall, and we could hardly have credited that such an architectural solecism had really been committed there as to design a Classic temple with an immense projecting rusticated podium, and then scoop out nearly the whole interior as a great hall, entirely irrespective of the strongly-marked division of the exterior design. The correction is a melancholy one to make, for it robs the Birmingham Town Hall of most of its architectural value. As a public hall decorated with an exterior order, and placed on a podium containing inferior rooms, it would have been a rather grand architectural conception; as it is, the exterior is nothing but a piece of deceptive scenery. St. George's Hall at Liverpool gives the true treatment for a Classic building of this type. That has also a lofty podium, with a grand flight of steps on two sides, and the upper step, on which the colonnade rests, represents the level of the floor of the great hall (all except the necessary entrance-step at the doorways) as it should do, while the Birmingham building is merely a stately-looking sham.

IN connexion with the publication a fortnight ago (p. 348, *ante*) in our correspondence column of a translation of the "Prussian Standard Rules for the Uniform Delivery and Testing of Portland Cements," it may be well to mention that a gathering of gentlemen interested specially in the uniform testing of building materials took place at Berlin last September, by request of Professor de Bauschinger, and that among the sixty persons present at this gathering, Austria and Switzerland were well represented, also Russia and France, with a delegate each in form of a Government official sent over for the occasion. The purpose of the gathering was to further the idea of uniform testing on the Continent, and the publication of the results of scientific and practical research referring to this subject. A unanimous decision was passed advising the formation of a proper society, with regular meetings and a fixed programme of work, as a mode of giving the movement a firmer basis, and after due consideration of the time required to make some decisive progress in the solution of the different problems now on hand, 1892 was chosen as the year for the holding of the next, or, rather, first official meeting of the newly-formed society, Vienna being selected as the



locality for this gathering, in lieu of Zurich, first proposed. The results obtained at the discussions of this year's meeting are to be published as soon as possible, time, however, having to be allowed for the careful wording of the decisions come to. It may be of interest to mention that the "testing of Portland cements" subject took up a greater part of the time devoted to the discussions, and that the subjects specially treated here were in regard to (1) quicker modes of testing, (2) use of steel-plate sieves in comparison with ordinary fine wire-sieves for the sand, and (3) the proper quality of the sand to be used in connexion with the cement-testing, and last, not least (4), the times of setting of trial cakes as well as the most practical form of these cakes for the tensile and compressive, as well as for the cohesive trials.

THE current volume of the "Minutes of Proceedings of the Institution of Civil Engineers" contains an interesting communication by Mr. L. J. Le Conte, on the "Contamination of Waters in Storage-Reservoirs on the Pacific Coast." He particularly notices the water-supply of San Francisco and Oakland as cases in point. The supply of the former city is derived from three large artificial storage-reservoirs, located in the coast range of mountains, and having a united area of water-surface of 1,140 acres; whilst that supplied to Oakland is obtained from storage-reservoirs having a united area of upwards of 410 acres. The seasons are so dry along this coast that, ordinarily, nearly half the year, and sometimes the whole year, passes without producing any water for storage purposes; and it has happened that no surface-waters have entered the reservoirs during an interval of 600 days. These periods of drought, occurring usually in summer time, cause a certain amount of stagnation in the water; offensive vegetable matter puts in an appearance, carbonic acid and light carburetted hydrogen gases bubble up from the bottom, and the quality of the water in consequence becomes much deteriorated. This goes on from bad to worse, until the rainfall commences, and the reservoirs are replenished. Owing to the different modes of treatment (which are briefly described) after leaving the storage reservoirs, the water supplied to San Francisco is of better quality than that supplied to the other city, where decomposition largely takes place, even in the supply-pipes. The author concludes that the primary cause of the deterioration is the putrefaction of the mud (which averages 10 ft. in depth) deposited by subsidence on the floors of the storage-reservoirs alluded to, and as a remedial measure he suggests that this mud be removed from time to time. Under the circumstances, however, we question whether such a common-sense recommendation will have much effect. Surely it must be useless to preach the doctrine of purification to those who are so far lost, or ignorant of the general principles of water-supply, as to permit the accumulation of such filth in the reservoirs for "many years," and who have for that period wittingly allowed the service-pipes to become receptacles of such an amount of putrefactive matter that when delivered to the consumer the water "is always very much worse than that of the surface-water in the reservoirs whence it comes." Not only should the filth be cleared out, but those also who are responsible for its accumulation.

WE have received from Mr. J. D. F. Andrews a copy of his "Rules for the Concentric Wiring of Buildings and Ships." An introductory leaflet asserts "that it has been found that [the electric light] has intense heat, and that it has generated many serious fires. . . . It does not effect disasters. . . . by spontaneous ignitions and explosions, for it requires no air; but it generates hidden fires where the wires are buried." This is rather startling, as it has been stated over and over again, by those who are supposed to be high and disinterested authorities, that no

electrical fires have ever occurred where the rules adopted by the leading insurance offices have been followed. It is, however, consoling to learn that "by the system of concentric wiring as devised and patented by Mr. J. D. F. Andrews, these dangerous properties have been entirely set aside by a mode of construction, and the simplicity and substantial and durable character of electric lighting greatly enhanced." Many of the rules laid down apply equally to all systems of wiring, and are, indeed, essentially those adopted by all competent contractors; but when the author suggests regulations that can only be fulfilled by concentric wires, he does not fail to point out that "a method . . . in concentric wiring in accordance with the above rules has been patented by J. D. F. Andrews." Concentric wires are not new, and for certain purposes they are unquestionably useful, but we wish Mr. Andrews had not felt it necessary, in pushing his wares, to call to his aid the now almost-forgotten terror, among the uninitiated, of the hidden dangers of electricity. Probably the science of no branch of engineering is so thoroughly understood as that of electricity. If an installation goes wrong, it does so on account of bad material and bad workmanship, or from such accidents as cause the explosion of gas or the bursting of a steam boiler,—not because of the absence of concentric wires.

IN the *Deutsche Bauzeitung* we find some interesting figures regarding the amount spent in Prussia during the last ten financial years for matters concerning directly or indirectly the improvement of natural intercourses and formation of new waterways. It appears that since 1880, 61,152,000 marks have been spent in improvement of the larger and smaller navigable rivers of the country; 74,812,000 for supervision and maintenance of works on these rivers; 47,142,000 for the improvement of the non-navigable parts; indirect expenses, including the erection of bridges. These various expenses make an aggregate of about nine millions. To this sum must be added another 9,000,000 for construction of new waterways and works pertaining thereto (the works on the Dortmund-Ems Canal and the North Sea-Baltic Canal having cost some 59,800,000 and 50,000,000 marks respectively during the above period). A total of 18,000,000 in a decade certainly shows to what an extent the waterway question interests the authorities abroad, and that a good inland connexion by water is considered to be of importance.

THE *Athenaeum* states that a committee, with Lord Melville and Professor David Masson (the poet's biographer) as chairman and vice-chairman, has been formed for erecting a suitable memorial over the grave of William Drummond of Hawthornden, in Lasswade churchyard. The church stands on an eminence about 2½ miles distant from Hawthornden. The existing church was built circa 1775; the site of the former is marked by an enclosure in the graveyard. What is known as "Drummond's aisle" is still preserved; and is thus described by the Professor in his *Life of Drummond* (1873):—

"A small arched space of stonework, with a roofing of strong stone slabs, and a grating of iron for doorway. Within that small arched space Drummond's ashes certainly lie, though there is no inscription to mark the precise spot as distinguished from the graves of some of his latest descendants who are also buried there. . . . The small arched aisle itself is his monument, and it is a sufficient one."

In this same enclosure is the tomb of Henry Dundas, created Viscount Melville December 24, 1802, Lord-Advocate of Scotland, and subsequently Treasurer of the Navy. His first wife was daughter to David Rennie, of Melville Castle, hard by. Hawthornden, where are the celebrated caves, reputedly of Pictish origin, in the rock above the North Esk, belonged in 1338 to the Abernethys, who sold the property to the house of Douglas, of

whom it was bought by Sir John Drummond, of Carnock, descendant of William, brother to Annabella Drummond, Queen of Robert III. It subsequently passed by marriage to Sir John Forbes, Bart. (died 1829), and went to his son-in-law, Mr. Francis Walker, who assumed the name and coat-arms of Drummond, and became second baronet. At the Stuart Exhibition was shown the table, from Hawthornden, carved with the Scots lion, and the initials R. S. and A. D., which belonged to Queen Annabella, and which Ben Jonson probably saw on his memorable visit to the poet. At Lasswade, Sir Walter Scott passed, 1798-1804, what—had he but known it—were the happiest years of his life, and in the cottage garden there he cultivated a taste for planning and planting which afterwards contributed to disaster. The phæton he used at Lasswade was the first to be driven in Liddesdale.

WE lately adverted to the fall of John Lombe's silk-mill on the Derwent at Derby. We read in the *Standard* that the equally famous mills at Cromford, near Matlock, by the same river, were destroyed by fire on the evening of Friday, 6th inst. These mills were founded by Sir Richard Arkwright in 1771, and are the first of their kind that were worked by water-power. They were built of gritstone quarried in the township. In 1769 Arkwright took out a patent "for spinning by rollers," and set up a small mill at Nottingham, horses being used for supplying the motive power. But finding the employment of horses too costly, Arkwright,—with the help of Messrs. Strutt, of Derby, and Need, of Nottingham,—removed to Cromford, or Crumbeforme, being attracted thither on finding he could use a stream which, flowing from the mines on the moor, was not liable to be frozen in winter time. This is the mill which is described by Darwin, with some ingenuity in view of so prosaic a theme, in his "Botanic Garden." Arkwright bought Cromford manor in 1789, and, having done much to promote the prosperity of the locality, died at Rock House in 1792. His son completed and endowed the St. Mary's Chapel which he had founded there. It was restored by the late Mr. Peter Arkwright thirty years ago. It is stated that the damage is estimated at 35,000*l.*, and that the mills, owned by Mr. F. C. Arkwright, of Wellesey Castle, were tenanted by Messrs. Hollins & Co., of Nottingham, merino spinners. Richard Arkwright was knighted, not for his inventive genius, or for his benefits to the world, but for having presented a local address to the King on his escaping Margaret Nicholson's attack.

THE parsimony of Government Departments frequently mars both the beauty and the utility of our public buildings. Here is an instance in which, for the sake of saving a comparatively small sum, the utility of the Law Courts has been diminished. The west and east wings are occupied by various legal departments, which have to be visited daily by large numbers of solicitors and clerks, to whom the saving of time is important. But the several stages of these lofty wings have to be reached by climbing up long flights of stairs. In any building in London owned by a company or by private persons, of such a size as the wings of the Law Courts, there would long ago have been lifts. As it is, not only are business men delayed and inconvenienced, but in some instances there is injury to health through the constant ascent of the stairs in question. Moreover, various attendants are in waiting about the staircases, so that the cost of working the lifts would not be additional. It is high time, indeed, that some pressure were put upon the Board of Works to motion the Treasury to sanction the placing of lifts in the Law Courts.

THE Arts and Crafts Association invited the Institute of Architects to visit the Exhibition at the New Gallery on Tuesday



evening. The east gallery was partly cleared as a reception-room and seats and a small platform placed in it, and Mr. Walter Crane presided while some speeches were made by Mr. Waterhouse and Mr. W. Morris, and a paper on the Arts and Crafts Exhibition, dealing with the relation of the crafts to architecture and pointing out the merits of some of the best exhibits, was read by Mr. Sedding. The speechmaking and reading was rather longer than necessary, especially considering that the noise made by the movement and conversation of visitors passing to and fro in the hall rendered it difficult to hear; and though Mr. Sedding no doubt felt, as he said in his paper, that the architects were "very much at home" in the Arts and Crafts Exhibition (as they certainly ought to have been), as a matter of fact the invitation appeared to have received very scant response, nor did we notice more than about half-a-dozen well-known members of the Institute among those present. This is a pity, and it is not creditable to the architects that they should be so indifferent to an invitation of this kind; it looks as if their interest in the artistic craftsmanship was rather lukewarm; which is not at all as it should be.

**T**HE exhibition of the works of David Cox at Birmingham, before referred to, formed the principal attraction at the Mayor's reception in connexion with the Art Congress, given at the Council House on the 5th, the Art Gallery Rooms being placed *en suite* with the Council House reception-rooms. A detailed examination of the collection in its completed form was calculated to further raise one's estimation both of the full and representative character of the collection, and of the genius of David Cox. The collection brought out in a remarkable manner the variety of his work, which is such in fact that it would not have been difficult to believe the pictures to have been the work of several different artists. Some there were, no doubt, which were rather like large blotted-in sketches or studies than pictures, and probably this was the light in which the author regarded them. A remarkable feature in the collection was formed by the oil-paintings, which, though a small portion of the whole collection, was much more numerous than might have been expected, and probably included nearly all the oil-paintings which Cox executed. They are not equal to his water-colours, but include some very fine works, well worth seeing. The exhibition at the galleries of the Royal Society of Artists in New-street, was another artistic attraction of the week, and contained some very good pictures, more or less known already, among which it was interesting to meet again one of the most beautifully-finished paintings which Sir F. Leighton ever produced, exhibited a good many years ago at the Royal Academy under the title of "The Juggler,"—a girl standing in front of a light-coloured curtain and throwing balls in the air, the face turned up and seen foreshortened, a remarkable piece of drawing. But the best of all the entertainments connected with the Congress was unquestionably the Reception given by the Local Committee on the 7th at the Edgbaston rooms. The entertainment included a well-known comedietta, acted by two amateurs, and an admirable performance of classical music by a small but efficient band, including the whole of Beethoven's First Symphony (the only one which lends itself to performance by a small band), which was much appreciated. The Local Committee deserve every credit for giving a really artistic turn to an entertainment on such an occasion, instead of leaving it a mere promenade.

**STREET IMPROVEMENTS AT BELFAST.**—At a special meeting of the Belfast Corporation on the 11th inst., it was agreed to petition the Local Government Board for a provisional order for street improvements at a cost of over 100,000.

#### A NOTE FROM ITALY.

A CORRESPONDENT sends us the following notes in regard to the ancient Christian house recently discovered in Rome:—

"In 1887 and 1888 excavations were carried on at Rome, on the Coelian Hill, under the basilica of St. Giovanni e Paolo, resulting in some of the most notable discoveries ever made in the field of Christian archaeology. The present discovery is that of a house which must have been one of the most magnificent of ancient Rome. Instead of the usual decorative frescoes, well known from the examples in Pompeii and Rome itself, the walls are covered with cycles of symbolic Christian paintings, used for the decoration of the walls and ceilings of the rooms in which lived SS. John and Paul, martyrs, under Julian the Apostate! In fact, this is the first known example of a Christian palace in Classic Rome. The entire ground-floor, containing more than fifteen rooms, is still in a good state of preservation.

The works began under the High Altar of the modern church, and two rooms were found, with the walls and the ceiling decorated with frescoes in a style of art of the decadence of the second half of the fourth century A.D. The decoration is composed of simple squares, with architectural ornaments and leaves, with fish and birds.

Continuing the excavations under the principal aisle of the church, the *tablinum* has been discovered, which measures nearly 7'00 x 4'50. Near the *tablinum* is found another room of lesser proportions, with frescoes.

Here, however, is to be seen, in an angle, the figure of a woman *praying*, of the same type as those found in the Christian cemetery catacombs. On another wall is painted the scene of Moses taking off his shoes before he ascended the Mount, as is seen in the frescoes of the Roman catacombs. The same Moses, probably in the act of striking the rock, is represented in another part of the wall, but this subject is indistinct, the painting being much damaged. On a wall constructed in a period subsequent to the *tablinum*, and near this, are found some frescoes representing historical scenes, which, according to the judgment of the well-known archaeologist, Com. G. B. De Rossi, refer to the Acts and Passion of the Christian Martyrs, and certainly allude to the martyrdom of Saints John and Paul, of whom it is narrated in ancient documents and ecclesiastical records, that they were killed, and secretly buried, by the order of Julian the Apostate, in their own dwelling, over which was subsequently erected the church. In fact, in the wall before mentioned opens a little window (*fenestella confessionis*) through which pilgrims looked down on the tomb of the martyrs. At the sides of the window are painted the images of the Apostles Peter and Paul, and beneath them a figure praying, at the feet of whom are prostrated, in supplicating attitude, a man and a woman.

The Commendatore De Rossi thinks that this scene represents one of the two martyrs before-mentioned, venerated by Pammachius and his wife, Faustina, who effected the transformation of the house into a Christian Basilica. On both sides of the wall are painted groups of figures which seem real and historical, among which is to be noticed a scene of martyrdom; two men and a woman kneeling, with their hands tied behind their backs, and who are about to receive a mortal blow from the lictors. The style of the paintings is of the end of the fourth century. The researches of 1887 were continued by Padre Germano, and several other rooms were found destined for different domestic uses. The edifice communicated with the public way by means of a vestibule which about the XI. A.D. century was made into an oratory and decorated with various paintings. The most important is a group in which is represented the Saviour, with a richly-gemmed vestment, holding in his left hand a volume on which is written: "Lux ego sum mundi; nunc qui cuncta creavi." On each side of the Saviour are the archangels, Michael and Gabriel. Near is the figure of St. Paul, dressed in the costume of the Byzantine court. Under the apse of the Church have been discovered two rooms, one of which is adorned with good paintings on the ceiling, representing scenes of vintage and various birds. On the walls are painted twelve winged genii, with simple mantle thrown over the shoulders, and sustained by the arms. A series of large festoons and flying birds decorate the intermediate spaces. These paintings reveal a still

flourishing state of art, and may be attributed to the epoch of the last Antonines.

In that part of the house destined to the use of baths have been discovered pipes for water and for hot air. The central hall of the baths is square, covered with an arched ceiling, and well cemented; on the wall facing the entrance there is the apse of the laconicum, as wide as the basin for the bath, formed of bricks, and covered with strong cement. Traces of fire are to be seen under the pavement of the central hall (*calidarium*); a chimney opening blackened by smoke, and tubes of terracotta for the transmission of the heat indicate that the pavement was that of the hypocaust.

In the excavations were found many amphore, and little lamps of terra-cotta, and fragments of decoration in marble. One amphora, for wine, had painted on the surface, in red colour, some letters and numbers, with the XP monogram between A and Ω." L. B.

#### ST. MARY'S (ISLINGTON) PUBLIC BATHS COMPETITION.

THE three premiated designs in this competition have been on view for the last few days at the Vestry-hall, and we have been invited to see them, and by implication we may presume to express an opinion on them. But before availing ourselves of this opportunity we must express our disapprobation of the system which has been followed occasionally in other Vestry competitions, of allowing only the premiated designs to be open to public criticism, and returning the others to their authors without any opportunity of public exhibition. The result of this is, in the first place, that the advantage to the architects and the ratepayers of a public criticism of the whole of the designs submitted, and the guarantee which such publicity affords of fair dealing on all sides, is practically nullified. The public and the architects want to know not only what are the merits of the premiated designs, but what are the merits of the whole number from which they are selected. In the second place, an architect who has produced a design of merit, but which has, from whatever reason, been unsuccessful, loses also the small advantage which he might otherwise have in a public recognition of the merits of his design. This is a minor matter, however; the important point is that if there is any value in public criticism of competition designs, it should be exercised on the whole of the designs from which the choice has been made, and not on the selected ones only.

Furthermore, the difficulties of criticising even the three premiated designs have been increased by allowing the selected design to be amended and altered to suit the wishes of the Commissioners; this is quite right, as far as it goes, but it would have been better to have exhibited the drawings immediately after the publication of the report of Professor Rogers Smith (the assessor) and previous to the alterations. With the terms of the award we are prepared to agree, so far as an examination and comparison of the three designs is concerned. The successful designs of Mr. Hessel Tiltman sent in under the motto of "Comme il faut," certainly surpass those of other competitors in method and convenience of plan. With regard to the elevations we can only say that the amended and coloured elevations are pleasing and are far in advance of the sepia-tinted elevations which were submitted in competition. We may here mention that though evidently not intended for our inspection, an opportunity of inspecting two of Mr. Hessel Tiltman's superseded plans was afforded us, and the comparison between this plan and that which has been amended and exhibited, is an instructive one. One point especially, we are unable to understand. Two swimming-baths, 90 ft. by 40 ft., are asked for in the instructions, but Mr. Hessel Tiltman has shown a second-class bath with a figured water space of 72 ft. by 37 ft., but the bath in question only scales 27 ft. This is misleading, and it is to be regretted that the credit of the additional 10 ft. has been given to Mr. Hessel Tiltman in the report of the assessor, though the error has been rectified in the amended plan. We may mention that rigid economy was absolutely necessary in designing this building, and that economy also was considered of the first importance in making the award, for the Commission did not feel justified in making a lavish expenditure of the money of the rate-



ayers, who decided by a bare majority upon the adoption of the Act in this locality.

The successful design shows the first-class swimming-bath adjoining Twyford-street, and this has the required size of 90 ft. by 40 ft. The second-class swimming-bath adjoins the latter, but has been kept much smaller both in length and breadth, which allows a small ante-room and lavatory accommodation to be placed at the west end for use in the event of public meetings being held in the winter; for exit in his case an additional door has been provided at the end of the Twyford-street frontage. At the other end of the small swimming-bath space is obtained for a convenient-sized hall, from which access is obtained to both the swimming-baths and to the eleven men's first-class baths, occupying a one-storied building at the corner of Twyford-street and the Caledonian-road. The pay office in one corner of this hall is flanked on each side by an entrance-passage. The north passage leads to the men's second-class baths, which are placed at the side of the small bath, and with a Board-room on the north side. Another entrance on the other side of the Board-room leads to the staircase to the women's baths on the first floor, and also to the establishment laundry, boiler-houses, and store spaces in the basement.

The arrangement of the wash-house and ironing-room has been considerably altered in the revised plans. The waiting-rooms and pay offices, originally placed in Stanmore-street, have been transferred to the Caledonian-road frontage, thus saving the expense of an attendant by utilising the pay box already mentioned. A feature has been made of a disinfecting-room and small yard at the corner of the Stanmore-street frontage.

A carefully-arranged suite of apartments for the Superintendent on the first floor is reached by a staircase from the hall already referred to. Mr. Hessel Tiltman's elevations have been considerably improved in the amended plans, and with the addition of colour have a pleasing effect.

The designs of Mr. J. Douglass Mathews, submitted under the motto "Cleanliness," have received the second premium; they differ in every way from those already mentioned. The baths are placed at the corners of the site, with their axis parallel to Twyford-street and Caledonian-road respectively. The intervening space is occupied by two entrances with pay-box between, and these also lead to men's first and second-class warm baths placed behind. This arrangement makes a convenient plan, and is economical as regards administration. The establishment-laundry is placed at the extreme end of the Twyford-street frontage, and adjacent staircase leads to the wash-house and laundry on the first floor. We cannot commend the position nor the projection of this compartment over a portion of the bath below, an arrangement which would be costly in construction and unsightly in execution.

Mr. R. J. Lovell's designs, submitted under the motto "Soap and water," have been awarded the third premium. The baths have been placed side by side; but, with a view to economise space and increase the water area, gangways have been omitted on one side, and a portion of the dressing-boxes of each bath on a gallery floor. We consider that the elevations of the second and third designs might have been much improved without adding to the cost of the building in any way.

#### THE "NEW SCOTLAND-YARD."

The new and striking building which has been erected at the Westminster end of the Victoria Embankment for the headquarters of the Metropolitan Police is now practically completed, and the Police authorities have, in fact, taken partial possession of it.

The architect of the building, as our readers know, is Mr. R. Norman Shaw, R.A., and notwithstanding the criticisms of Sir William Harcourt and other would-be authorities on architecture, — criticisms with which we dealt at the time, — the building is one which is admirably adapted to the purposes for which it is intended. It will be devoted entirely to offices and stores for the several departments of police administration. There are no cells, as it is not intended to keep prisoners in the building.

The building forms a large quadrangular block, completely isolated and well lighted on all four sides, with a large courtyard in the

centre, and a large open space or yard on the west side, between the building and the backs of the houses in Parliament-street. The granite for the massive plinth which forms so striking a feature of the external *façades*, and which is continued round the interior of the quadrangle, is from Dartmoor, and has been worked by the convicts there. A noteworthy point is that where the windows are partly below the line of this plinth, and partly above it, the millions of the windows are in the same granite up to the level of the top of the plinth, above which level they are continued in Portland stone. There is, moreover, no moulding, string-course, or other feature in relief to mark the junction between the granite plinth and the superposed brickwork. The principal doorway leading to the offices is a very effectively-designed composition in Cornish granite, from the De Lank quarries. This doorway opens on to the new private roadway which will bound the building on the side nearest to the Houses of Parliament, and which, leading from the Embankment to Cannon-row, at the back of Parliament-street, will give access to the large yard or open space in the rear of the building, where cabs and other licensed vehicles can await the inspection which must precede the granting or renewal of a licence.

Internally, the building is very simple in plan, consisting of, in the sub-basement, a large brick-vaulted crypt extending under the whole area of the building (courtyard included). Above that portion of the crypt which is covered by the buildings is the sub-ground floor, which, together with the crypt, will be used for storage and other purposes. The ground-floor is a few steps above the level of the external roadway, and will be entirely occupied as offices. A broad, end-lighted, vaulted corridor runs along the centre of each of the four sides of the quadrangular block on this and the floors above, and opening into this corridor are doors giving access to the various departmental offices. Each departmental group of offices is so arranged as to be self-contained. The construction of the corridors and floors throughout is fire-proof. The greater part of the constructional ironwork was supplied by Messrs. Measures Bros., and the remainder by Messrs. Homan & Rodgers. The floors of the principal corridors are of marble-mosaic, executed by Messrs. Wilkinson, who also supplied and laid the concrete paving generally, including the granolithic with which the floor of the crypt and the courtyard are paved. The floors of all the rooms are laid with Mr. Roger L. Lowe's wood-block flooring. The stores and casement-openers are by Messrs. Elsiey & Co. The whole of the internal plumbing has been done by Messrs. Wenham & Waters, of Croydon, who have also executed the heating arrangements. The trends of all the stairs are of Craigleith stone. The electric lighting installation is by Messrs. Drake & Gorham. The lifts (for passengers and stores) are by the American Elevator Company. The dado mouldings and architraves in all the rooms are executed in Keene's cement. The doors are all framed in oak, but have pine mouldings and *papier-mâché* panels, — the latter concealing the diagonal members of the frame, and forming light but sound-proof doors, the whole being painted. Above the ground floor is a *mezzanine* floor devoted to offices of minor importance, and above that again is the first floor, in which, at the corner nearest Westminster Bridge, is the room for the First Commissioner. This room has pleasant outlooks from the windows of the angle-turret, and is lined for the greater part of its height with panelling in American walnut. This is the only room to which any richness of effect has been given. The tile-borders have been supplied by Mr. J. C. Edwards, of Ruabon. The second and third floors are entirely appropriated as offices, and the floors above partly as offices and partly as stores for clothing, boots, and everything else connected with police equipment. The upper parts of the external and quadrangular *façades* of the building are of red brick with Portland stone dressings and strings. The whole of the work is built in cement, and the foundations are carried down to depths of from 30 ft. to 40 ft. into what was at one time part of the bed of the Thames, several old piles having been found. As far as possible the massive foundations of the ill-fated Opera-House, which was commenced and half-built on the site some years ago, have been utilised to carry the new building. All the external gutters are of stone, lined with Claridge's asphalt.

The building has been erected by Messrs. John Grover & Son, builders, of Wilton Works, New North-road, whose foreman has been Mr. William Brown.

The clerk of the works is Mr. Erant. The total cost of the building will be about 120,000*l.*

#### THE ART CONGRESS AT BIRMINGHAM: PRESIDENTIAL ADDRESS IN THE SECTION OF ARCHITECTURE.

THE following is the second half\* of the address delivered by Mr. T. G. Jackson, M.A., F.S.A., as President of the Section of Architecture:

To some it may seem that I have put too much into my curriculum; "Who, then," they will say, "can become an architect?" No doubt, all this is not to be done in the three or even five years of pupillage, and if an architect's education is, as many suppose, to be compressed into that term, there would be an end of the matter. But these three or five years, rightly regarded, are but the opening of a course of study which is to end only with the student's professional life. An architect is not like a tailor or a hatter, who, having once learned to make a coat or a hat, has nothing to do but to go on making similar coats or hats all his life. He has a duty to himself and to his art; he must be constantly trying to make his own work better, and himself a better artist; and, in so far as he succeeds in doing this, he will be doing something towards the general progress of art itself. I have given him enough to do; plenty to occupy all his working hours till his powers of work fail him; but not more than is well within the bounds of possibility; not more than is done by dozens of architects at the present day, I am happy to say; men whose work you would all rank deservedly as the best outcome of modern architecture, and not more than is accepted as their proper line of study by many, if not most, of those younger men in the promise of whose work lies the justification of our hope for the future.

It is needless, however, to say that this is not the education nor the practice of the majority of professing architects, but since they, most of them, undertake a vast amount of work in addition to architecture, with which it has as little to do as it has with medicine or divinity, they should be the last to charge my programme with being too full and comprehensive. If they would throw aside a great part of my scheme as superfluous and *mal à propos*, they more than fill up the gap by fresh subjects of their own, and those, too, subjects which are quite of a different nature. What can be more foreign to architecture than the valuation of building land, the letting of ground on building leases, the decision of questions of light and air, and the awarding of compensation for infringement of ancient easements? and yet these are all matters, strange as it may seem, that most professing architects consider within the scope of their business, and in very many cases they make up the greater part of it. Why skill in designing and building a house should be supposed to help a man to an estimate of the value of the land it stands on, is a curious question; it seems at first sight equally reasonable to take the opinion of a painter upon the market price of the cattle he puts in his picture. But whether absurd or not, so it is, that all this work which properly belongs to the surveyor, or the lawyer, is habitually undertaken by the architect. It is impossible that both kinds of work so undertaken can be well done: two callings so distinct as surveying and architecture can never be successfully practised by the same man, he cannot serve two masters, and either he will hate surveying and love architecture or he will despise architecture and hold to surveying. And when it comes to the question, which of the two must go to the wall, the issue is not doubtful. The surveying work touches upon property and income, and cannot be put on one side; it must be attended to at any cost first, and consequently architecture comes off second best, and is only attended to in spare hours. Very often, indeed, it is not done at all by the ostensible architect. Too busy to attend to it himself, he gets it done for him by some humble "ghost," to whom is due whatever merit the design possesses. At the Liverpool Congress, in 1888, I gave several instances that had come to my knowledge of large and important

\* We printed the first half last week.



buildings—works offering splendid architectural opportunities—of which the nominal architect had not done a single drawing, in some cases the whole being the work of a "ghost," in others the details being filled in by the builder from sketches of the vaguest and roughest kind. I need not now do more than refer to what I then said. The buildings in question were, for the most part, erected by great corporations or city companies, and the nominal architect was their surveyor. The real architect in such cases is the poor "ghost," who surely deserves, in common honesty, whatever credit is to be got out of the building, but of whose existence neither employer nor public ever hear a whisper. As for the ostensible architect, he is nothing but a middleman, who contributes nothing to the work, and whose useless intervention might much better be dispensed with, leaving the employer face to face with the real designer, who would, in all likelihood, turn out much better work if he acted as the principal and not as his shadow.

Now, if this is the right way to practise architecture, it is clear that all I have been saying on the matter of education is beside the mark. If architecture is so easy a matter that it can be attended to in a man's off-time, it is idle to talk of devoting a life-time to it and finding that all too short. From this point of view, architecture is not an art at all; it is only an employment which may be usefully combined with the more commercially important profession of surveying, and this is no doubt the view of it which many people hold. At an Art Congress, such as this, it is surely unnecessary seriously to combat this opinion. To us, at all events, architecture is an art or it is nothing, and as such it demands the whole of a man's time and attention. It is impossible for men whose best hours are occupied in matters so foreign to architecture as those I have named to turn out anything better in the way of design than the mediocre stuff, even if it be no worse, with which our streets are lined. I do not blame these gentlemen for this,—far from it,—they are but human, and the fault is not theirs if they fail to achieve impossibilities. The blame lies with the public, who force an impossible task upon them, and rest so well satisfied with the melancholy result. By the separation of surveyor's work from that of the architect, both would be better done. Let the surveyor be satisfied with the important and honourable work which belongs to his profession,—work involving as much delicate and skilful conduct as that of the lawyer, to which it is in many points so closely allied, work which, if it will please him, I am quite prepared to admit is even more necessary and useful to society than ours. There is quite enough there to occupy him, and all we ask in return is that he should attend to himself, but to which we are ready and anxious to devote the service of a life-time. There can be no hardship in this to any one. There would be the same amount of work to do, and the same number of men to do it, but it would be differently distributed, each man taking up that calling for which he was best fitted by his natural endowments, and following it with all his powers, free from the distraction and interruption of other work of an utterly different nature.

Returning to the education of the architectural pupil, the question arises, How is he to get that part of it which lies outside the doors of his master's office? Is he to pick it up for himself as well as he can, or, if not, what is there to help him to it? Now, indubitably, in many ways, a man is his own best master; and the greater his turn for art, the more important it is that he should not be fettered by system, but encouraged to follow that line of study which most attracts him, and to develop his knowledge in his own way. But at the same time, I am far from undervaluing the help a beginner may receive from organised methods of teaching by classes and lectures and in the studio. For many years the Architectural Association, a body recruited from the younger members of the craft, has carried on the work of mutual improvement in a manner which it is difficult to praise too highly. If has its regular classes for instruction by volunteer teachers; its meetings for reading of papers and discussion, its designing club, its travelling studentships, and, in summer time, its excursions to visit new buildings or buildings in progress, and to sketch and measure old buildings, not only in England but on the

Continent. Hitherto the system of instruction has been voluntary and mutual, but it is now proposed to organise it more efficiently with paid teachers and an architectural studio. In order to carry out this programme, which naturally involves new and heavy expenses, the Association applied to the Institute of Architects, the older and wealthier society, in hope that that body would put itself at the head of the new educational scheme and aid it with its resources. The Institute, on its side, has also been agitated by the question of education, but has come to a very different conclusion to that of the Association; its solution of the problem being to establish a system of examination, and to close its doors to all who fail or decline to pass it. The reply that was received by the Association, therefore, was to the effect that the Institute was not a teaching but an examining body. The Association, having thus asked for bread and received a stone, is now thrown back on its own resources, and is courageously trying to carry out its educational scheme unaided from without, a task in which we may heartily wish it success.

With regard to the examination question, while fully recognising the good intentions of the members of the Institute, and the pains they have taken with their scheme of examinations, I cannot but feel that, like many other people, they have confused examination with education as if they were the same thing, instead of being, as they are, perfectly distinct, and sometimes even opposed to one another. In other branches of study the balance of opinion seems inclining against examination; it has been protested against by many headmasters and professors, and is only accepted by others as a necessary evil and because no substitute for it can be found. It is altogether idle to attempt to justify the examination of architects, and the diploma which is the next step we are threatened with, the effect of which would be to make architecture a close profession, on the ground that law and medicine are already close professions, and that admission to their ranks can only be had by examination. Society imposes these tests on lawyers and doctors for her own sake, not for theirs. Her object is not to educate them, but to protect herself from doctors who do not know the effect of their own drugs, and lawyers who cannot draw a conveyance or a will through which they could not drive a coach and horses. If, in the same way, society thought fit to guard herself against unwholesome and insecure buildings, by requiring that everyone who built a house should pass an examination in building construction, it might be a very good thing, provided, of course, builders, surveyors, and engineers had to pass it as well as architects; and this would be the true parallel case to that of the lawyers and doctors. But to think that any test can be devised to protect society against bad architects, and secure to her the blessing of good art, is as ridiculous in the case of architecture as in that of painting or sculpture. You may examine the student in construction, and enable him to show himself a competent builder; you may examine him in the history of architecture and the character of its various styles, and enable him to show himself a fair antiquarian and historian; but no examination can devise will measure his artistic capacity. He may be commonplace in intellect, unsusceptible of impressions of beauty, vulgar in taste, and hopelessly barren of invention, and yet what examiner would dare reject him on those grounds, even if he were able to discover them? Provided he can pass muster in those subjects which can be learned from books and lectures, you will be bound to pass him, to set your seal upon him, to hall-mark him as sterling metal, and to produce him to society as your idea of an architect.

If I may offer a suggestion to the Architectural Association with reference to their scheme of education, it would be this,—that success in examination should not be the goal towards which the aim of the student should be directed. That can never form a worthy motive for study. Let the young architect pursue that which interests him, and that which he feels he wants and ought to know as an artist, and not that which he thinks will pay best with the examiners. In the printed report of the Association are these words:—"We are of opinion that the subjects included in the intermediate and final examinations of the Royal Institute do not comprehend the whole of the knowledge necessary to an architect, and that provision should, there-

fore, be made for the study of certain additional subjects." What these are may be gathered from a paper read to the Association by Mr. Reginald Blomfield, from whom, I am happy to say, we are to hear more on the same subject this morning. He says:—"An exhaustive syllabus has been provided for the study of the history of architecture and of the science of construction and drain-pipes, &c. I still think that one particular corner remains untouched, and it is the education of architect as artists." Such matters as modelling, study of colour, figure-drawing, and general design of other things besides pure architecture, are subjects which will not pay with the examiners, and cannot be brought to the test of examination; but nevertheless they do, I rejoice to see, form part of the course of study which the more active members of the Association propose to themselves.

But there is another side to the question of education in art. It is of no use training artists unless the public on their part learn to recognise and appreciate good art when it is offered to them; and as to the general incapacity of the British public for anything of the kind artists seem to be unanimous. From all sides at the two preceding Congresses at Liverpool and Edinburgh arose a chorus of lamentation over the dulness and indifference of society. And if this is true of the other arts it is so in a still greater degree of architecture. Every man likes to be thought to have an opinion about pictures; but how few are ashamed to confess that they understand nothing about architecture, and do not care to learn? Even among professional artists who are not architects, how few have given any attention to it; how seldom does a painter even learn to draw it correctly, and how often is an architect's eye offended by crippled arches, mis-proportioned columns, false perspective, and ill-drawn details of buildings in pictures otherwise meritorious? How often, too, will you see accomplished painters dwelling contentedly in homes of the most appalling architecture? And if such as they are ignorant or careless of the difference between good and bad architecture, what hope can there be of finding the general public more discriminating?

But if the public neither know good architecture when they see it, nor take any pains to get it, depend upon it no improvement in the present state of things can be hoped for. Art follows the general laws of economic science; there will be no supply unless there is a demand. So long as you are content with the average architecture of the present day, so long will you go on getting that and nothing better. As Sir Frederic Leighton said, in his inaugural address at the first of these Congresses, "What you demand that you will get, and according to what you accept will be that which is provided for you." Individual architects may do their best and get well ahead of the current taste of the day, but the number of those who employ and value them is so limited that the few really good buildings produced under such conditions stand out as exceptions, and have no power to lift architecture, as a whole, out of the bathos into which it has sunk. They show the way, but it rests with you to follow. "That architecture is not dead," said Professor Aitchison, at the Liverpool Congress, "is because architects present it gratuitously to their employers." There is no general demand for it; the wretched architectural failures that spring up on all sides are what the public really like, or they would never be built, and the men who build them would have nothing to do, and so long as this is the case we shall have nothing better, except in the isolated cases to which I have alluded.

And yet surely of all the arts there is none that concerns us so closely as architecture. Life is possible without the others, but not without this. There is no escaping from it. Painting and sculpture have to be sought out, and, when bad or uninteresting, may be avoided; but architecture is ever with us; you have it in your home, and it meets your eye at every step as you walk down the street. Surely if any form of bad art is insufferable, bad architecture,—which you cannot run away from or move out of the way,—is, or should be, the most intolerable of all; and if any form of good art is pleasurable, none is so capable of giving constant enjoyment as architecture when it is good. Surely it is worth the while of every educated man and woman to acquire such a measure of architectural knowledge as will enable them to recognise and enjoy good work



when they see it, and, as a natural consequence, eschew the bad.

The architectural education of the public formed the subject of two papers read at the Congress last year. Both authors argued that one instruction in the history and characteristics of the various styles should be taught as part of an ordinary school education. This, I do not doubt, very desirable so far as it goes, but it is not enough without some instruction in the general principles which underlie all styles, and to which they owe their being. It is very easy to study art too much and too exclusively on the historical side, and to forget that we, too, have it in us, if we please, to contribute a chapter of our own to the history of art, and that our studies of the past ought to be only instrumental to our better use of the present. If our work is to have any real life now, and any claim to the respect of those who follow us, it must be no mere reproduction of bygone styles; it must be intensely modern, instinct with the spirit of the age in which we live, surely the most wonderful and original the world has ever witnessed. I have heard a modern building condemned by a popular critic because it was like nothing he had ever seen. This reminded me of the Latin prose and Greek ambics of our school and college days, when, if ever we ventured on some humble flight of our own, we were pulled up with the question, "Where do you find that? What is your authority?" Even then we used to feel that, for as our invention may have been, it was of condemned on the proper ground. And so when you see something in modern architecture that strikes you as novel and unexpected, do not ask whether there is authority for it in the past, but ask yourself whether it is reasonably constructed, suggested by some necessity of plan or material, or resulting from some artistic idea of proportion or composition; in short, whether there is a precedent for it, and whether it is sensible and beautiful, and if you find it to be so, for heaven's sake welcome it, and rejoice over it as a sign of life and progress. As a last word I would say, think for yourself, and defy the critics. "You English," said a Savoy, "see with your ears." At a Congress like this, when we are met for the purpose of talking about art, it may seem ungracious to say that a great deal too much is written and said about art than is good either for artists or for the public. And yet there is no doubt that an analytical dissection of art, especially from the subjective point of view, does much to divert your attention from the proper use of it. Art is meant to be enjoyed in a healthy, natural, unconscious way, like the landscape, the sky, and the flowers, and if we philosophise about it, analyse and dissect it, we are but treating it as the botanist treats the flower when he pulls it to pieces, petal from petal, to scrutinise it bit by bit under the microscope, and so destroys the object of his researches.

#### ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION AND THE RAILWAY SCHEMES.—A special meeting of the Edinburgh Architectural Association was held on the 7th inst. to consider the schemes of the Caledonian and North British Railway Companies, when resolutions were adopted thanking the Lord Provost for the judicious attitude he has assumed on the question, urging the Town Council to oppose any proposal to encroach on Princes-street gardens unless it is proved to be absolutely essential for the public convenience, and protesting against any embankment of the tunnel along Princes-street. It was also agreed to call not only for plans, but sections and elevations of the proposed alterations of the Waverley station, and the change which will be effected on the architecture of the city by the Caledonian project. These resolutions were ordered to be sent to the Lord Provost.

DUNDEE INSTITUTE OF ARCHITECTURE, SCIENCE, AND ART.—The Dundee Institute of Architecture, Science, and Art opened its winter season by a *conversazione* in the Victoria Art Gallery on the 5th inst., when the President, Mr. Over, delivered an address.

THE ITALIAN RENAISSANCE.—Under the title, *Arte Italiana, Decorativa e Industriale*, an important monthly publication, illustrative of Italian Renaissance work, is to be issued shortly by Onania, of Venice.

#### THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday afternoon last, Sir John Lubbock in the chair.

**Free Library for Bermondsey.**—On the recommendation of the Finance Committee, it was agreed, subject to the usual conditions, to lend the Vestry of Bermondsey the sum of 7,000*l.*, to defray the cost of erecting buildings for a new Free Library for that parish.

**The Bethnal Green Slum Scheme.**—With regard to this scheme, the Finance Committee reported, for the information of the Council, that the Committee had passed the following resolution:—"That this Committee recommends the Council to sanction the incurring a liability for the Bethnal-green Improvement Scheme not exceeding 300,000*l.*, and that such amount be included in the estimate to be now submitted to the Council;" and that the amount had been included accordingly.

**Report of the Special Committee on Contracts.**—This report, the discussion of which was adjourned until next week, owing to the late hour at which it was reached, was in the following terms:—

"Your Committee have proceeded upon the reference made to them on June 4, 1889 (No. 5), to receive a deputation from the London Building Trades Committee, and to inquire into the subject of fair contracts which that body wished to bring before the Council. Your Committee have had an interview with the London Building Trades Committee, and have also received deputations from the Amalgamated Union of Street-masons, Paviors, and Stone-dressers, and the London Amalgamated Trade Society of Upholsters. The representations made by each of these deputations were in the main of similar character, and may be briefly summarised as follows:—That contractors were in the habit of driving their workmen to scamp their work, and also of employing inferior workmen at low wages; that sub-contracting was a common practice; that sub-contractors were unscrupulous in the means they adopted to insure a profit; and that the workmen and the quality of the work alike suffered in consequence. The deputations urged that with a view to remedy to some extent this state of affairs, the Council should exercise a rigorous supervision over all work done for it under contract; that sub-contracting should be absolutely prohibited; that a scale of the wages to be paid to the workmen should be attached to every contract; that all contractors should be compelled to observe the trade union rules in relation to hours of labour and rates of wages; that the Council should impose heavy penalties upon contractors offending in these respects, even to the extent of refusing, after offence had been proved, to allow them to act as tender for work under the Council; and, further, that all the Council's contracts should only be let to London firms, and the work under them be executed by London workmen. The deputations were, however, unanimous in the desire that the Council should employ its own workmen and should carry out its own works, without the intervention of contractors.

Your Committee have carefully weighed the statements with reference to inferior workmanship, but can find no positive evidence that inferior work has been done for the Council or for its predecessor, the Metropolitan Board of Works. They are, however, fully alive to the importance of keen supervision being exercised over works of construction, and are of opinion that the Clerks of Works employed by the Council should be highly trained specialists who should be capable of promptly detecting inferior materials or bad workmanship.

With the allegations of sub-contracting, your Committee have found it very difficult to deal, having regard to the impossibility of defining what is the real meaning of the term in the sense in which it is used by the deputations and understood and applied by the contractors. Workmen apply the term sub-contracting to any other form of labour than day-work. Piece-work, task-work, bonuses to foremen, or any arrangement made of a special kind, is, in their opinion, sweating or sub-contracting. Some contractors do not consider piece-work and task-work to be sub-contracting, and regard sub-contracting as effected only when they enter into a contract with a second person who finds both labour and materials. The clause usually inserted in the Council's contracts with reference to this subject is as follows:—

"The contractor is not to assign or make over this contract to any other person, nor to underlet it, nor to make a sub-contract with any workman or workmen for the execution of any part of the brickwork, groundwork, masonry, or any other work appertaining to this contract, but he is to employ his own workmen for the labour thereof, who are to be paid by him in wages by the day. And in case the contractor assigns or makes over this contract or makes a sub-contract contrary to this agreement he shall for each offence forfeit to the Council the sum of £500, which shall be deemed liquidated and ascertained damages, and shall be recovered by action or deducted by the Council from any sum or sums due or to become due to the contractor under this contract or otherwise howsoever; and should

the contractor or his agent give any gratuity to any officer of the Council, the Council shall be at liberty to determine this contract."

This appears to your Committee to be sufficiently stringent for the protection of the workmen employed, more especially as the Council now requires every person tendering to make a declaration that he pays such rates of wages and observes such hours of labour as are generally accepted as fair in his trade; and the London Building Trades Committee concurred with this view. Your Committee would, however, point out that if taken in its literal meaning and applied to the whole of the works under some contracts, this clause would become worrisome, inasmuch as in many cases it is absolutely necessary for the contractor to enter into sub-contracts for the supply of certain portions of the materials to be used, as, for instance, iron girders, and also for the execution of some of the work which he would himself be unable to produce or carry out. Your Committee are of opinion that such cases should be provided for by an addition being made to the clause; and they recommend—

'(a) That the following words be added to the clause, now inserted in the Council's contracts, with reference to sub-letting or sub-contracting:—But the Council retains power to allow the contractor to sub-let such special portions of the work as would not be produced or carried out by him in the ordinary course of his business.'

With regard to the suggestion that a schedule of the wages to be paid to the workpeople should be attached to each contract, your Committee are of opinion that, previously to any action being taken on the question, the various trade societies should submit the schedules of hours, wages, and conditions of work which they desire should be adopted.

With reference to the suggestion that the letting of the Council's contracts should be limited to London firms only, and that the work should be carried out by London workmen exclusively; your Committee are of opinion that if this course could be taken, which they have reason to doubt, its adoption would inevitably add materially to the cost of the works carried out by the Council. Stone and iron, for example, can only be obtained from places at a distance from London, and the advantage derived from their being fashioned at or near their sources is twofold,—the work of preparing them is more efficiently and economically done, and the cost of carriage is less, inasmuch as the weight is reduced by the waste portions being left behind, and only the completed parts carried to the buildings or other works for which they are required. Inspection to ensure good work can be insisted upon even during production.

With regard to the suggestion of the deputations that the Council should employ its own workmen and carry out its own works without the intervention of a contractor, your Committee are of opinion that this could not be done without involving a very large outlay for plant, which the Council would not be justified in incurring. Indeed, the special plant required for some works would probably cost as much as the works themselves. Moreover, the Council could not keep in permanent employment a sufficient staff of workmen to cope with a sudden emergency, such as the bursting of a sewer for instance. Your Committee would point out that the Council has in many cases where men have been employed through a contractor on work of a continuing character, taken these men into its direct employment and dispensed with the contractor's intervention; and your Committee think that this course should be followed wherever practicable. There can be no doubt that it is better for the men to be employed directly by the Council, and the contractor's profit on their labour is to a large extent saved. Your Committee therefore recommend—

'(b) That all work of a continuous nature, which does not involve a large outlay for plant, &c., such as the cleaning and watching of the bridges and embankments, &c., under the control of the Council, be executed as far as possible by men directly employed by the Council, without the intervention of a contractor.'

Your Committee further recommend—

'(c) That a copy of this report be sent to the London Building Trades Committee, the Amalgamated Union of Street-masons, Paviors, and Stone-dressers, and the London Amalgamated Trade Society of Upholsters.'

**Proposal to take Pupils in the Offices of the Council.**—Mr. Brereton moved,—

"That it be referred to the Standing Committee to consider and report whether it is desirable, in the interest of the public, to utilise the educational advantages to be obtained in the professional departments of the Council by allowing the heads of those departments to receive a limited number of pupils."

In support of his proposal the mover urged that it was very difficult to get competent, "all-round" men to fill important appointments on their staff, particularly in the Engineer's department. This he attributed partly to the fact that as a rule municipal engineers holding public appointments were debarred from taking pupils, and partly to the fact that in all such offices the assistants were kept too much to one branch of work.



Dr. Longstaffe seconded the motion, which was opposed by Mr. Burns, Mr. Howell Williams, and Mr. Beachcroft, who all contended that the proposal was an impracticable one.

The subject was still under discussion when the Council adjourned.

### Illustrations.

#### DECORATIONS: ST. GEORGE'S CHURCH, NEWCASTLE-ON-TYNE.

**W**E give this week reproductions from photographs showing the chancel decoration of this church, the general scheme being designed by Mr. T. R. Spence, the architect of the church; the figures of the Apostles were drawn by Mr. C. W. Mitchell. Mr. Spence writes:—

"The entire available wall-space is covered with mosaic, somewhat after the manner of the famous fifth and sixth century mosaics in the churches of Ravenna. On the north and south walls are ranged the Twelve Apostles, at the same height as the three figures on the east wall, of our Lord, the archangel Michael and Gabriel. The background to these figures and to all forms of ornament embraced in the scheme is of deep blue, slightly varied in tone over the surface. Above the figures runs a deep band of enriched strongly-coloured conventional foliage. The spandrels of the arches between the morning chapel and the organ-chamber are filled with figures of angels representing acts of praise."

The mosaics were executed by Messrs. Rust & Co. Several coloured drawings of the work are at present hung in the first-floor balcony or corridor at the Arts and Crafts Exhibition.

#### STUDENTS' CLUB, ERLANGEN.

This is a students' club for a small University town. The *façade* is of sandstone, with coloured majolica work inlaid in the walls. The basement contains kitchen, larders and store-rooms. On the ground-floor is a large saloon, a beer-room with a verandah, and a billiard-room. The first floor contains the drawing-room, reading library, &c.

The architect is Herr Theodor Eyrich.

#### SCHWARZENBERG CASTLE, FRANCONIA.

This is a restored elevation of a castle belonging to the Princes of Schwarzenberg, who now however live chiefly in Bohemia, and the German castle has been turned over for offices and habitations for officials connected with the estate. The restoration of the *façade* has been carried out under the direction of Herr Theodor Eyrich, of Nuremberg.

#### LODGES, PARK HATCH, GODALMING.

These lodges will flank the principal entrance to the park. The walls are built of Bargate stone, and the roofs are covered with Horsham stone slates. The timber work in the gables is oak. The carriage-way is stone pitched. The covered ways are paved with red brick. The lodges are placed between old yew hedges.

Messrs. Mitchell Bros., of Shalford, are the contractors, and the architect is Mr. Edwin L. Lutyens.

#### HARLESDEN SCHOOLS.

The design for these schools was selected in a limited competition. They are about to be built in Acton-lane, and afford accommodation for 300 children. There is a great fall in the ground from the front to the back; this necessitated a covered playground under part of the girls' school. They are to be built of red brick, with stone dressings to the windows; the roofs to be covered with slates. The builder is Mr. Collinson, of Teddington; the architect, Mr. J. Martin Brooks.

**THE VILLAGE HALL, ORPINGTON.**—Messrs. Thomas Gregory & Co., of Clapham Junction, write to say that their system of wood block flooring was used in this building, illustrated and described in our last. The omission was not ours.

**MILBANK PRISON.**—The Penitentiary at Milbank, which until four years ago served as one of our largest convict prisons, was finally closed on the 1st inst. The premises will be vacated on or before the 10th inst., and then, we understand, the site will be cleared.

### COMPETITIONS.

**BOARD SCHOOLS, OLDHAM.**—A special meeting of the Oldham School Board was held on Saturday last to decide upon the plans for Coppice School, when the assessor (Mr. W. Landless, Architect to the Leeds School Board), who was appointed to adjudicate upon the plans, was present. It was stated that thirty-eight designs had been sent in, four of them being from local architects. The whole of the designs had been carefully examined by the assessor, who had selected seven for the special consideration of the Board. These were gone through, one by one, after which it was decided to award the premiums as follows:—First premium of 50*l.* to the author of the design numbered 1, Mr. G. E. P. Lawrence, Albert Buildings, Queen Victoria-street, London. Second premium of 15*l.* to the author of the design numbered 53, Messrs. Phillips and Holcgate, Newport and Cardiff. Third premium of 10*l.* to the author of the design numbered 15, Messrs. Winder and Taylor, Priory Chambers, Oldham. The designs are on view in Messrs. Scott Bros.' rooms, Ascroft-street, and will be open to the inspection of the public for a few days.

**AYR FREE LIBRARY.**—The Committee met on Monday night, and decided that in the new building there be a lending and reference department, with shelving for 30,000 volumes. The general reading-room is to have accommodation for 100 readers; a small room is also to be provided for ladies. The cost of the site is under 2,000*l.*, leaving about 8,000*l.* for the building itself. The following architects were asked to send in competitive plans:—Mr. Washington-Browne, Edinburgh; Messrs. McArthur & Watson, Edinburgh; Campbell, Douglas, & Morrison, Glasgow; T. L. Watson, Glasgow; John Honeyman & Keppie, Glasgow; John Barnett & Campbell, Glasgow; D. Sturrock, Glasgow; J. M. H. Young, Stirling; Morris & Hunter, Ayr; Wm. Kerr, Ayr; and H. Eaglesham, Ayr.

**THE ASHTON, STALYBRIDGE, HYDE, AND DISTRICT CARRIAGE CO.'S PREMISES.**—In an open competition for new premises for these buildings the first premium has been awarded to Mr. Joseph Lindley, of Hyde, the second to Messrs. J. George & Son, Ashton, and the third to Messrs. Benwell & Taylor, of York.

#### THE PAST, PRESENT, AND FUTURE OF THE ARCHITECTURAL ASSOCIATION.\*

We last week printed *in extenso* the two papers on this subject read at the last meeting of the Association by Mr. A. Beresford Pite and Mr. Walter Millard. We now give the remaining two papers, by Mr. Needham Wilson and Mr. Owen Fleming.

##### Mr. Needham Wilson's Paper.

I must confess to a feeling of hesitancy in addressing the Association on this subject, for, receiving my student education in the provinces, I had passed the time, on arriving in London, when the Association's Classes could have been of the most benefit to me. But though I am debarred by this and my recent membership from speaking of the past with the intimate knowledge of many here, I trust I can be acquitted of lukewarmness since I have been called upon to interest myself actively in the objects of this Association. Indeed, I fear I may be rightly taxed with presumption in giving my views on its work and prospects after so short a service in its ranks. But though I cannot speak authoritatively of the past, the present affects me, and the future excites my warmest interests.

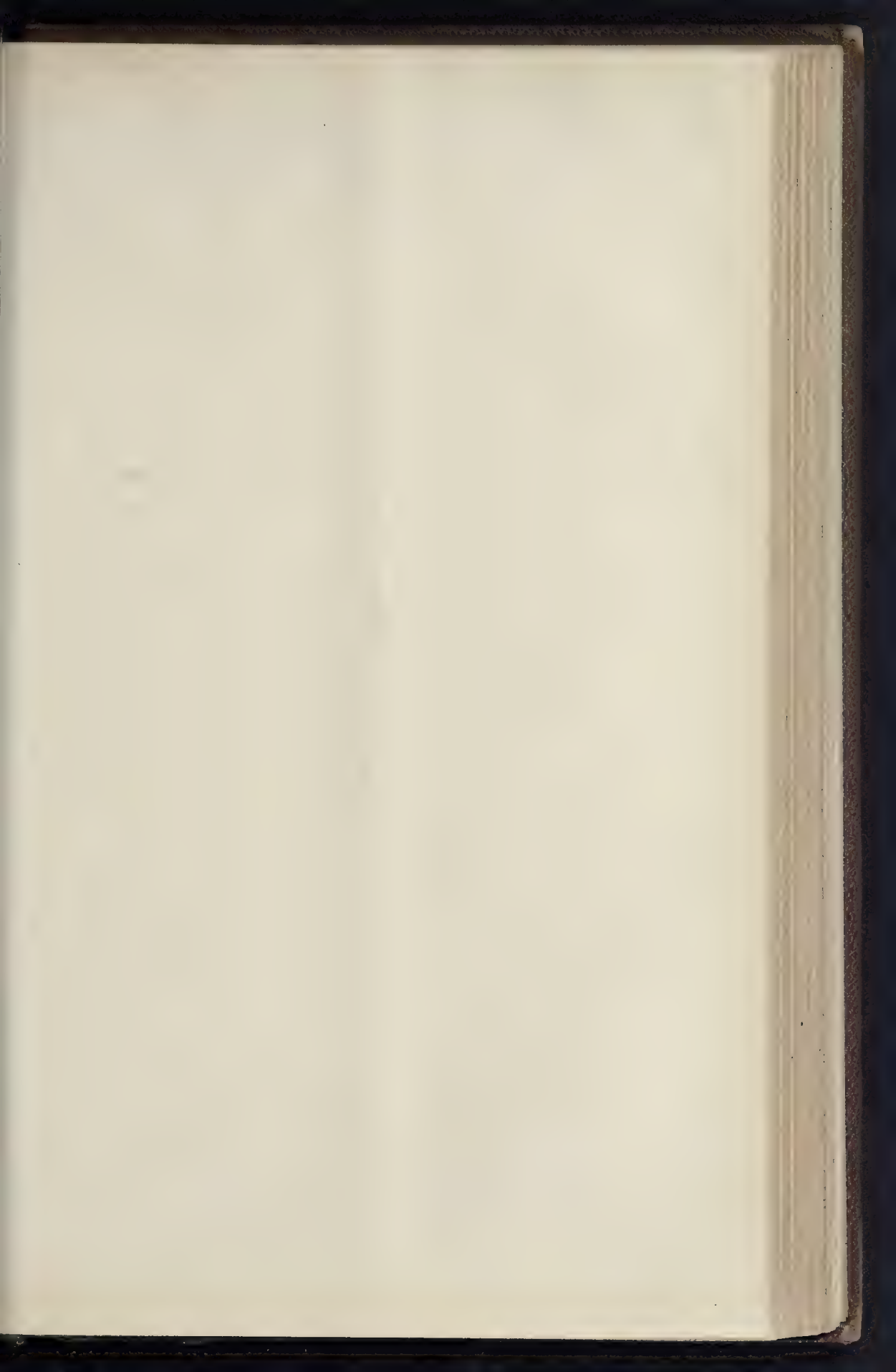
The past of this Association requires neither eulogy nor defence from me. Results speak for themselves, and I need mention no names to remind you of the work this body has done, and the manner in which it has set its seal on the architecture of to-day. I therefore confidently leave the past to take care of itself, and pass on to the present, which seems to me to be indissolubly linked with the future, and about which I can speak with more confidence.

Now, it is claimed by some that the Architectural Association is not to-day justifying its past high character and traditions. We are bidden to believe that it has not moved with the times, and that, if it is to maintain its high character and traditions, alterations must be made in its methods of teaching. Thus we are led to believe that the Architectural Association is in a transitory state, and its

\* See p. 369, ante.

affairs in a state of chaos. But if the educational methods that have obtained hitherto have been so successful, why are they so no longer? What has occurred to disturb the equilibrium of the Architectural Association, and what has led many of its members to believe that we are lagging behind the age? If we are losing ground, how is it that we now number 1,129 members, against 1,052 two years ago? Or does this indicate a paper strength represented by the 100*l.* arrears of subscriptions? I take this augmentation of numbers to imply approval of the educational methods, and not as an argument in favour of change. Indeed, I find that the increase of members is less at the commencement of this session than it was at the beginning of last session. Is this the result of the proposed changes? Why are they necessary? We are told that we are not meeting the educational demands of our students. Let us examine this statement, which seems to be based on the assumption that the Architectural Association is above everything a teaching body. This assumption appears to be of recent birth, for the first clause of Rule 2 surely cannot be construed into such a meaning. Then why should the suggestion now be made? Is it because of that bogey which is always being dangled before our eyes, the Institute Examination? Is this the cause of the solemn opening declaration of the committee appointed to inquire into our educational methods? "Gentlemen," they begin, "it has for some time been evident to these members most intimately acquainted with the working of the Architectural Association, that a desire existed amongst the active members (who are the active members?) for some change in the teaching methods hitherto followed." What has occasioned this desire, unless it is the Institute Examination? If so, it follows that the aim and end of this Association, as far as its educational adjuncts are concerned (and these are to be paramount), is to prepare students for that Examination. I say nothing against the Examination, as far as it goes, but I do object to its being made the basis of our educational methods. The very wording of the committee's report is contradictory on this point, for though somewhat ostentatiously announcing it as the basis of their proposals, they seem to have had a lingering presentiment that it was not all it should be, and so they interspersed in parenthesis, and as a sort of afterthought, the enunciation that it would not form the limit of any systematic scheme of instruction established by the Architectural Association. I am led to ask—if not the limit, why the basis? And why should this Association resolve itself into an academy for preparing students for the Institute Examination? I venture to think that the chief function of this Association is neither to compete with other organisations as to which shall have the honour and glory of turning out academic architects, nor to become a mere cramming machine, nor to usurp the system of pupillage. I venture to think that the educational functions of the Association are distinctly supplementary, and were designed to furnish the student with facilities for studying those subjects which he could do in office hours. I am not giving an essay on the pupillage system,—the spirit and vigour of our architecture as compared to the academic style on the Continent is its best defence,—but I do take this opportunity of emphatically protesting against any educational scheme that will have the effect of doing away with that system. The jeers that met some remarks of mine on this subject not long ago considerably opened my eyes, and certainly did not tend to dispose me favourably to such an educational scheme as that before the Association. Up to that point of the controversy I certainly never contemplated such a result of the proposals; but the way in which my remarks were received left no doubt that the majority of those present so considered it, to say nothing of subsequent speeches. I have nothing to say against any scheme to prepare students before entering an office. By all means let us have one. But I judged that many would far rather receive their training in the Architectural Association or other Classes than in an architect's office. Where, then, would they receive that early practical acquaintance with office routine that is so essential? I venture to think that a man must be born an architect, and no amount of office or academical training will make him one if it is not in him. He may make a tricky draughtsman, he may know to a decimal fraction the







DETAILS OF CHANCEL DECORATION, ST. GEORGE

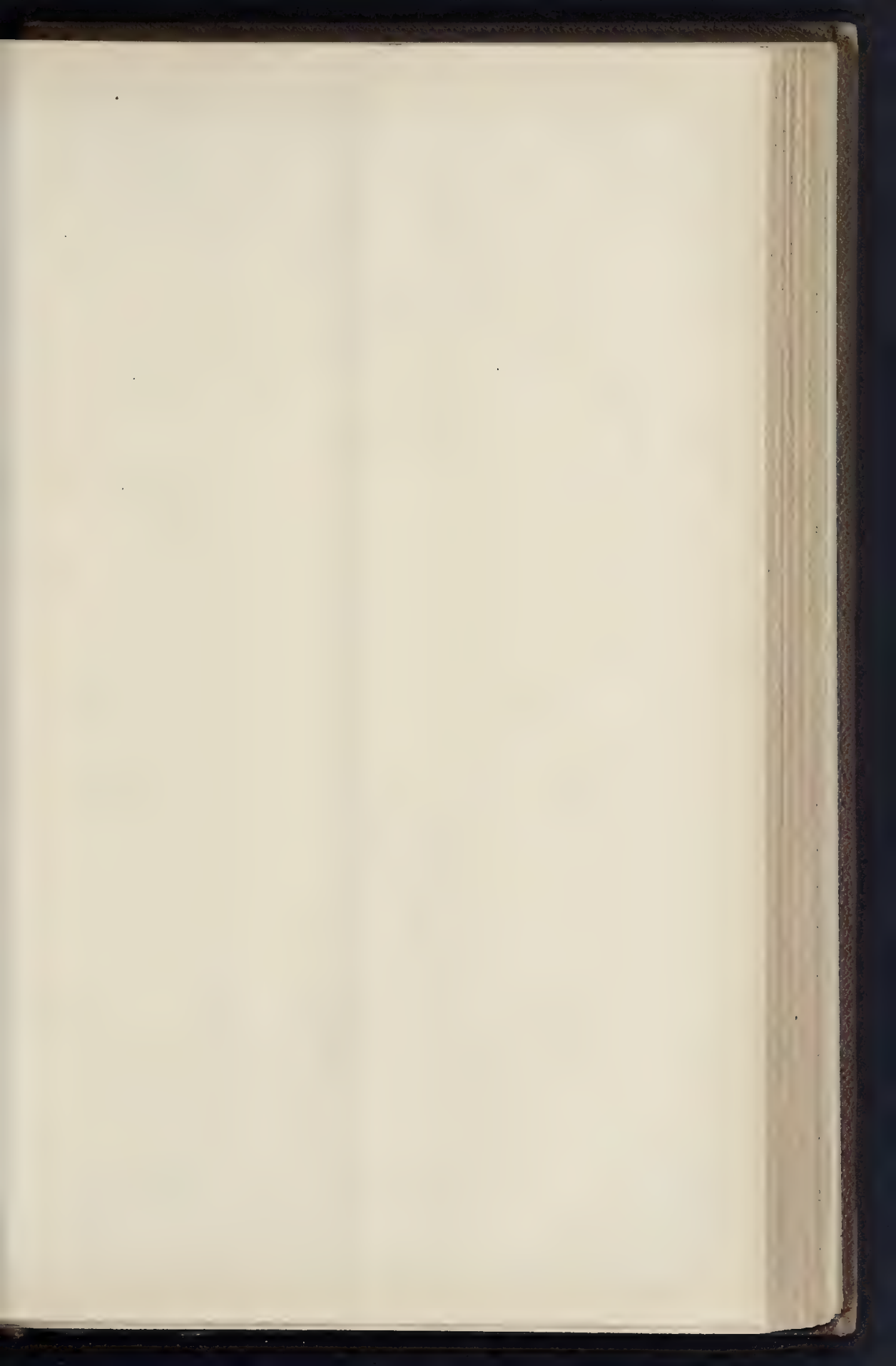




NEWCASTLE-ON-TYNE.—MR. T. R. SPENCE, ARCHITECT.





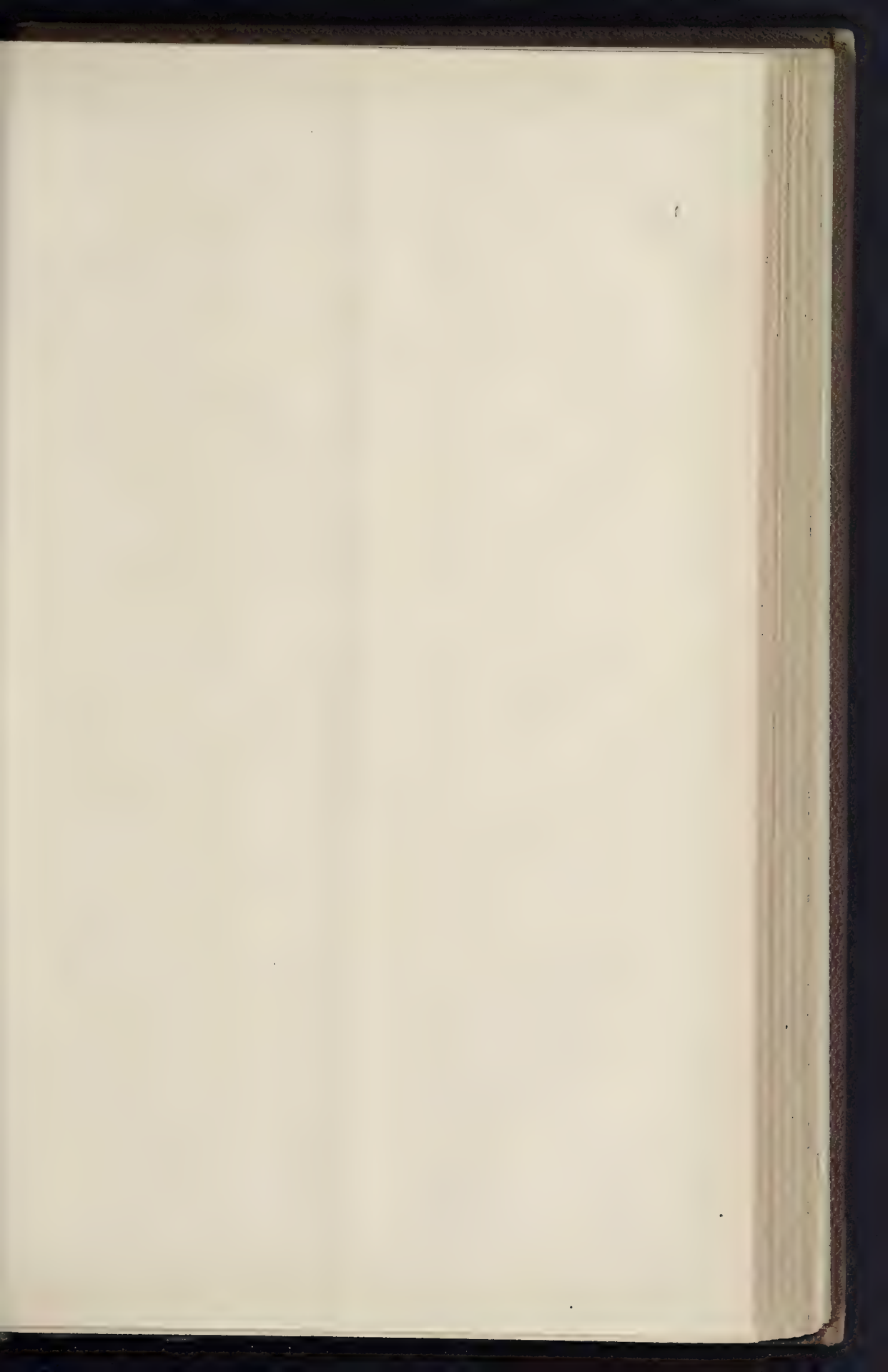


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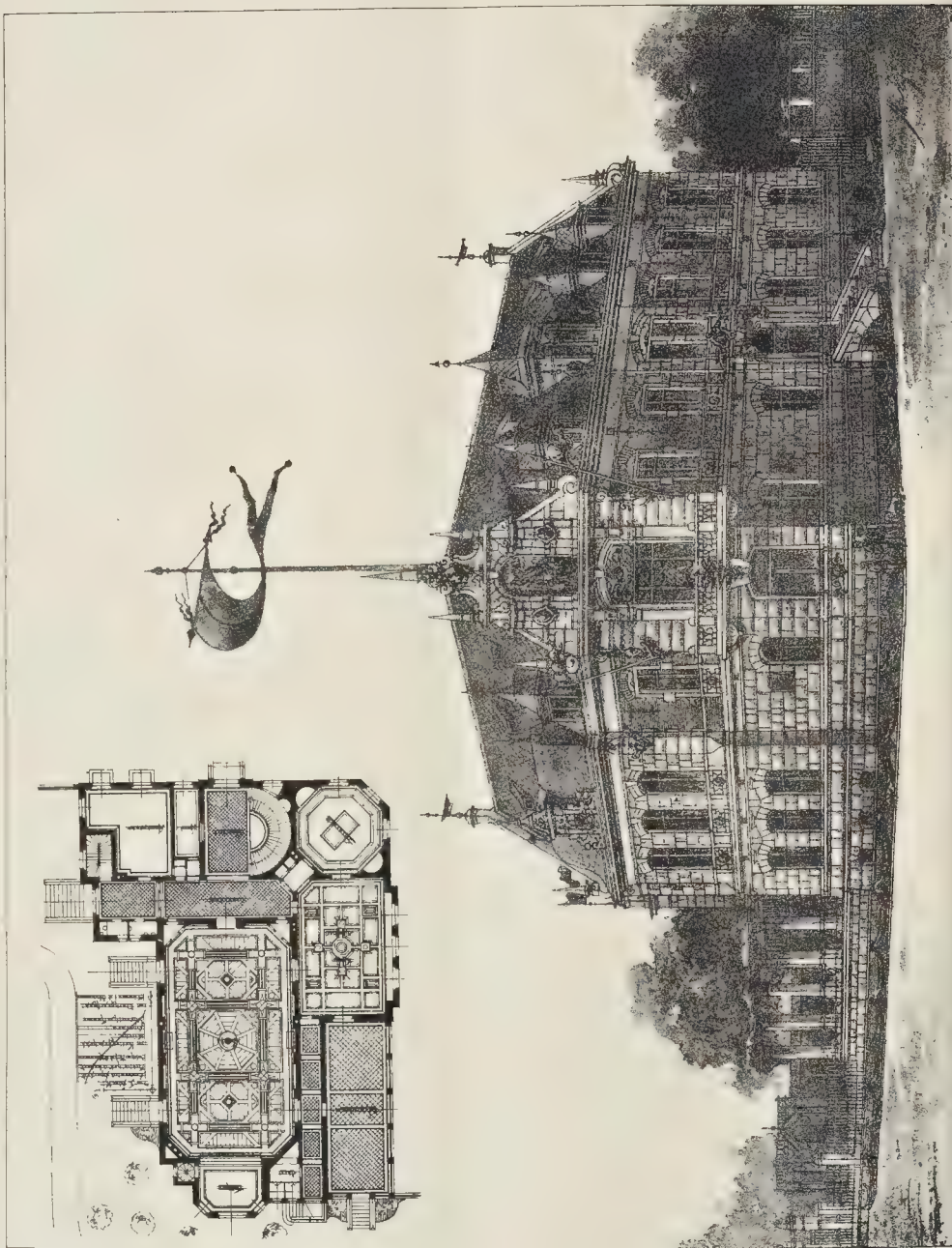
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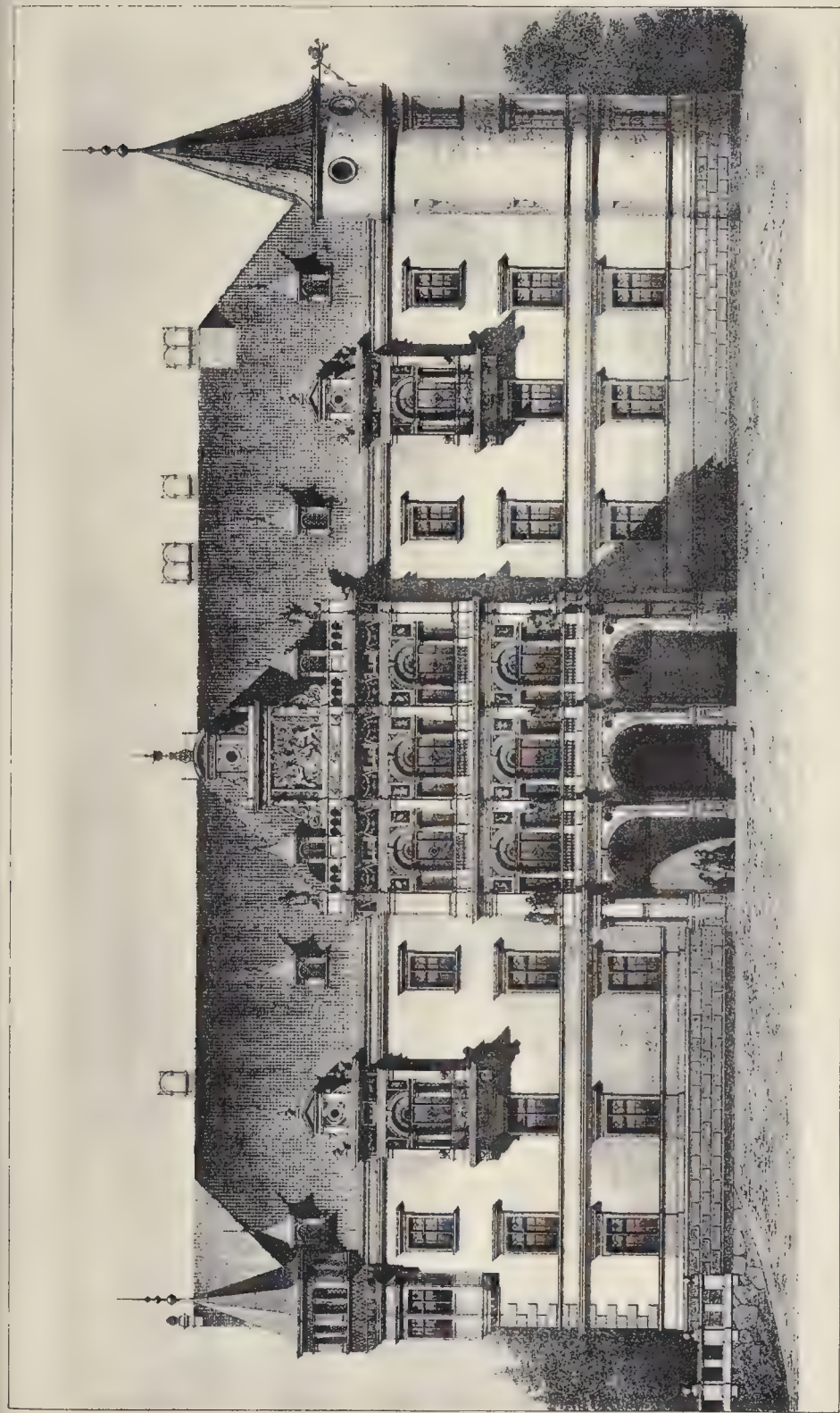




THE BUILDER, NOVEMBER 15, 1890.







RESTORED FRONT OF SCHWARZENBERG CASTLE, FRANCONIA.—HERR THEODOR EYRICH, ARCHITECT.



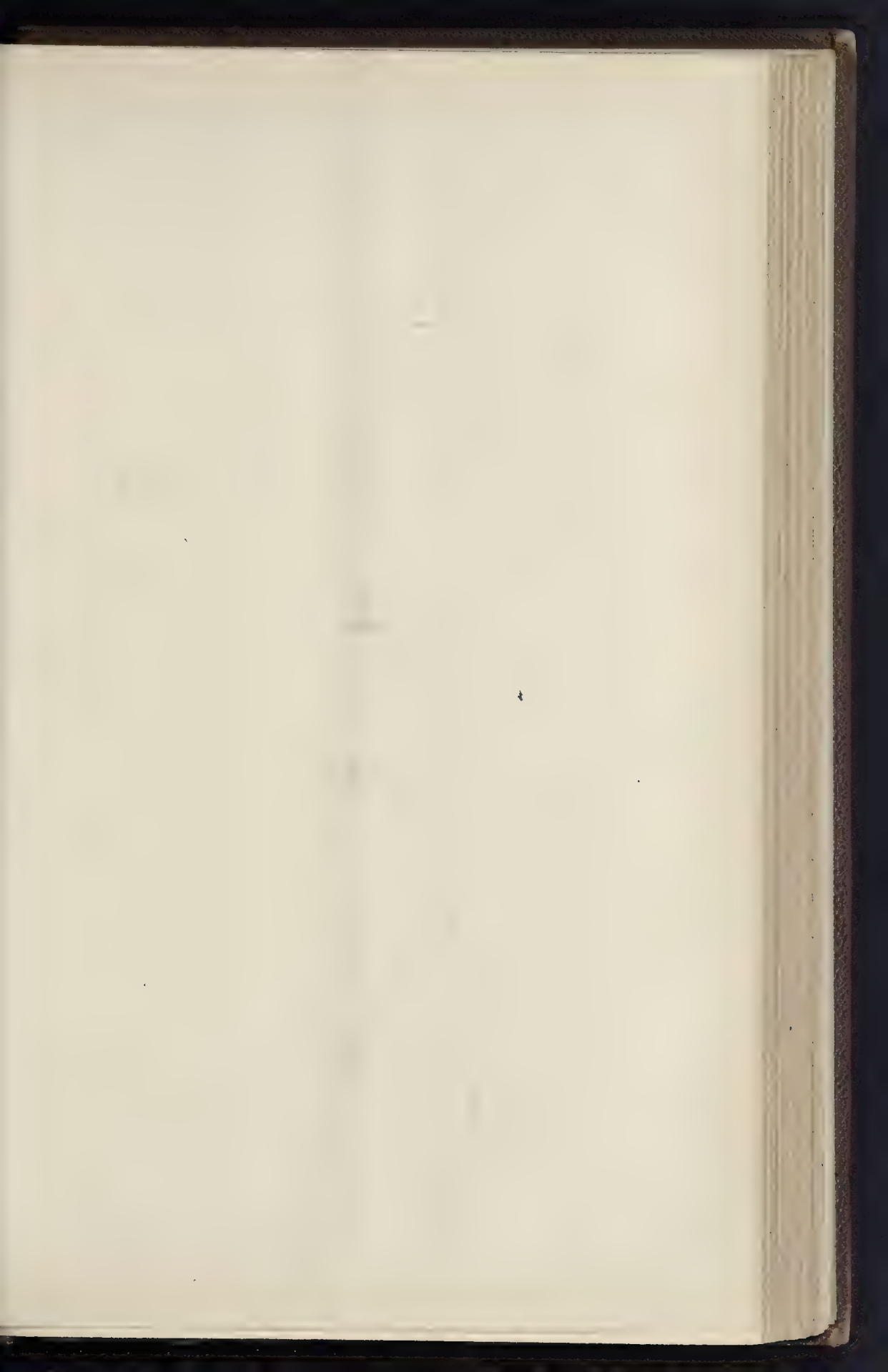




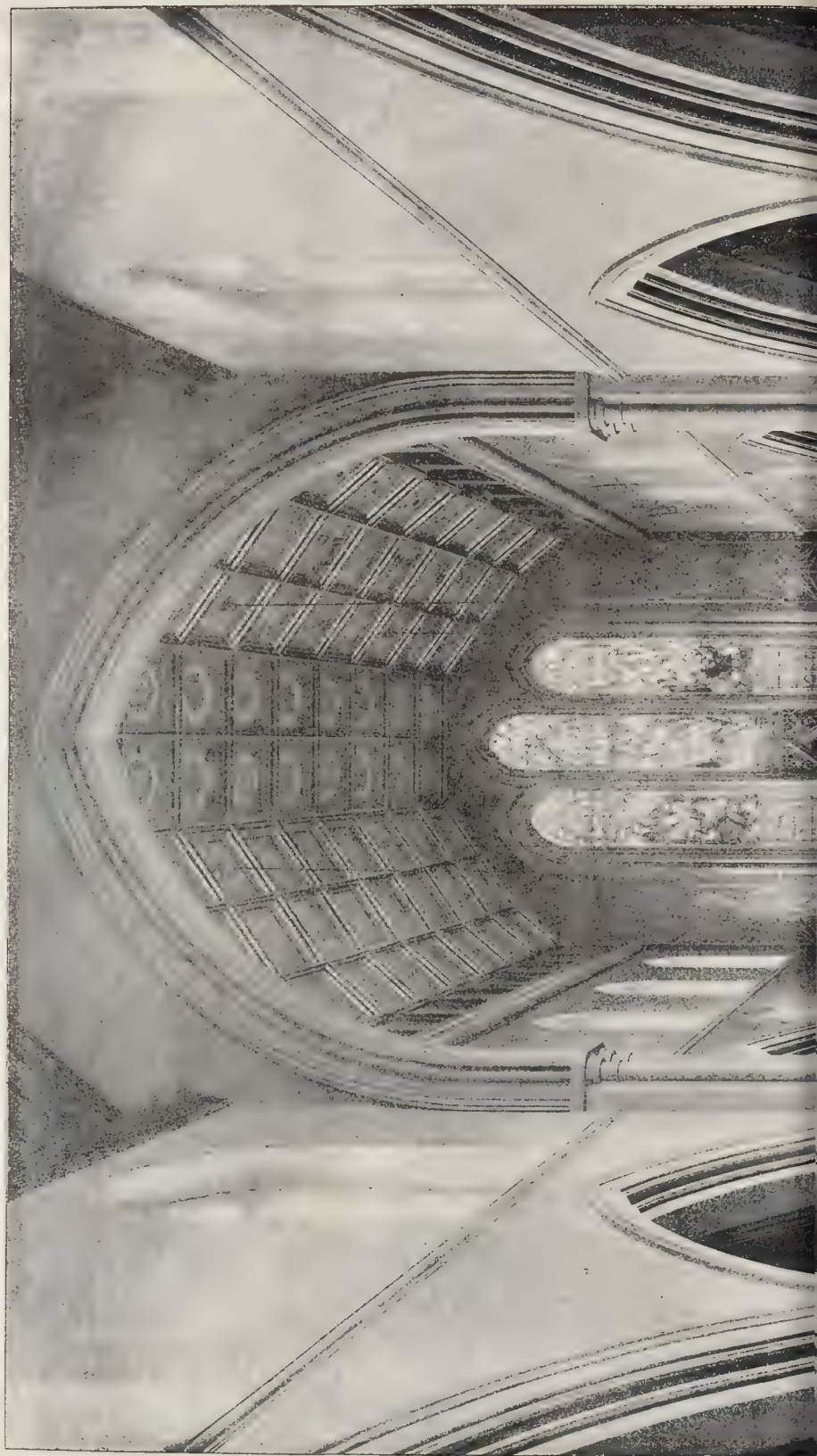
Walden ?  
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J. Martin Brooks  
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St. Paul



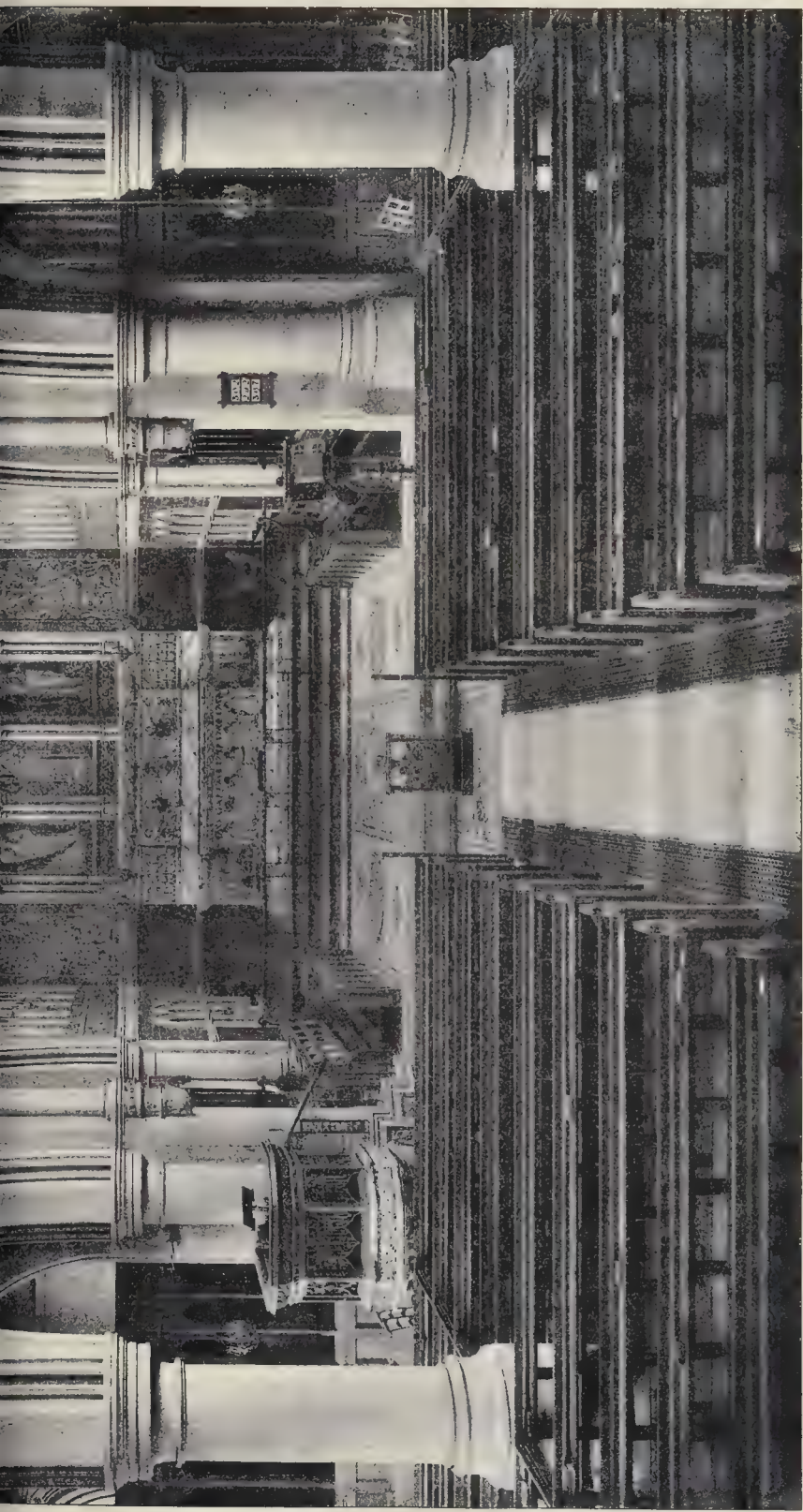




THE BUILDER NOVEMBER 15 1900







ST. GEORGE'S CHURCH, NEWCASTLE-ON-TYNE. MR T. R. SPENCE, ARCHTCT.  
INTERIOR-SHEWING GENERAL SCHEME OF CHANCEL DECORATION





proportions of Diogenes' tub, he may be ground through a curriculum (I like that word—it is no suggestive of scarifying), he may even pass Institute examinations and develop into a fulgent A.R.I.B.A., sinking into oblivion as a full-fledged Fellow; but unless he is born to it he will never make an architect.

Is it because this scheme, with its studio, day-classes, &c., would need far less hard work, than those members approved it? We are always being told of those who learn nothing in an architect's office, whose premiums and years of pupillage are wasted. Then I venture confidently to assert that, in nine cases out of ten, it is entirely their own fault. At the risk of being considered egotistic, I must say that I was educated in an office where my thirst for information was answered by, "Find out." And I had to, and precious little help did I get; but the experience I gained,—by hard work, mind you, and keeping my eyes open,—laid a solid foundation for any superstructure to be raised on it. No, sir; no curriculum will make an architect.

I will not stay now to dwell on the dangers inherent in the professorial system, though I venture to express the opinion that the proposed fees would provide but mediocre talent. If this teaching is to do more than merely instruct in theories, and pad students with a lot of knowledge only to fit them for clerks of works, it requires men in the very front rank of the profession, men whom I take it are better employed in practice for themselves. Those are the men wanted; can they be secured?

To what are our educational methods tending nowadays? Flashy and tricky draughtsmanship, which seems to be superseding the good, steady, old style. Is this a cause to make the Architectural Association believe it is not advancing with the age? Then I am thankful if it is not.

No, Sir: I am still open to conviction that academic training will make architects. Such as have had that training are not particularly distinguished for brilliancy compared to others one can name, who have gained their knowledge by the process known as picking-up and hard work, witness the testimony of two gentlemen who addressed you a fortnight ago.

We are told, as an argument in favour of change, that there is a diminution in the number of members attending Classes, and that members of these Classes are not reaping the advantages they should,—that the work is perfunctory, &c. Now I take it that mere numerical strength is no criterion to judge the Class-work by, but the proportion of work done to members present and the nature of such work as being true indications. Comparing the sessions 1887-8 and 1888-9, for which I have the full figures, I find that in the former year the attendances in seven Classes numbered 1,200, and the drawings and papers submitted, 991,—i.e., an average of 23 and 19 respectively for each meeting. In the following year the attendances fell to 983, and the papers and drawings to 927, or an average per meeting of nearly 19 and 18 respectively; so that though there were on an average four members less attending, the work is represented by an average of only one less per meeting.

And if I include the session 1886-7, omitting the Elementary Class of Design, for which I have not the figures, I obtain the same satisfactory result. It is difficult to compare the figures of last session; but I think they sufficiently bear out my contention. It is stated that the rules enforcing work if attending have been more strictly applied, and this has had the effect of ridding the Classes of some dead weight, and representing them at their true instead of a paper strength. If members are not deriving the benefit they should, why do the reports of the Class secretaries testify to the increasing value of the work, or are we to believe that they present bogus reports and exaggerate the value? If the administration of the Classes has become slack, let us improve it. Perhaps the Classes do now partake of the nature of erratic satellites revolving round the central body. If so, then it is high time that the central body should control them more firmly. At the same time, I suggest that all the Classes should be entirely self-supporting, provide their prizes, and even contribute to the general working expenses of the Architectural Association. That the Classes are too cheap I freely admit, and the subscriptions to most, if not all of them, might well be raised. That this can be successfully done we have recently had an example of, though the increased fee was subsequently reduced on the "split-the-difference" principle.

Now I come to a subject most intimately connected with the past, present, and future of the Architectural Association: I mean its finances. I have made it no secret that much of my antipathy to the educational scheme lay in the fact of its embodying a proposal to raise the subscription,—a proposal based on three main statements, viz., that it would be necessitated by the increased cost of the curriculum; that the Association's income is now insufficient for its requirements, and that additional clerical assistance is urgently needed for the secretary, or that a paid secretary must be appointed. I have dealt with the first, inasmuch as I condemn the scheme supposed to necessitate it; and, with regard to the second, I must beg leave to traverse it somewhat fully.

How the Committee had the courage to make it, after 140*l.* had been spent in 1888-9, and 115*l.* in 1887-8, on the *conversations* and *soirée*, I leave them to say. If this is a specimen of the way the Architectural Association's funds are dispensed, I do not doubt that the present subscription is inadequate. And apparently the cost of the *conversations* is increasing, for I find that 94*l.* were absorbed by it last session, and I hear over 100*l.* this session. I do not advocate its discontinuance, but surely it need not be so heavy a burden on our funds. To spend about an eighth part of our income in these frivolities, and then set it up as a plea for raising the subscription, is surely a thankless task. Cannot the cost of the *conversations* be much less, and the *soirée* either abandoned or made self-supporting? If we have so many who are wedded to this latter meeting, surely they would not object to pay the small charge that would render it independent of the general funds, as the annual dinner very nearly is.

There is, too, an ugly item in the balance-sheet that I have already referred to. I mean the large amount of subscriptions in arrear.

If it is now difficult to collect the subscription, what would it be with a doubled one?

Does this mean that the strength of the Architectural Association is a paper strength? for this amount is not diminishing. Surely some very drastic action is necessary to remove this shackle, instead of condoning these arrears by raising the annual subscription. The income of the Association is insufficient! I should think so, with over 200*l.* a year wasted or lost.

But, these drawbacks notwithstanding, we seem to be in a healthy financial condition, with assets amounting to 831*l.*

Now, taking the third statement, I find that 65*l.* is annually devoted to clerical assistance, though what proportion goes to the secretary I cannot say; though, we are informed that he is annually 25*l.* out of pocket—a fact that no one regrets more than I do. My contention, therefore, is that the saving effected in the manner I have indicated should be partly devoted to additional clerical assistance to the secretary rather than the insufficiency of the present sum allotted be used as a lever to raise the subscription.

Further, if we consider the proposal as inseparable from the educational scheme, there is much to be said against it. For students a guinea entrance fee and a guinea annual subscription, in addition to fees for the curriculum, would in many cases be a heavy tax—and for those who have passed the student stage, many of whom are members of the Institute, and who derive no great benefit from the Architectural Association, though giving it the benefit of their moral support and experience, it is too much to expect them to put their hands in their pockets to pay for others' education. And, again, if we consider the proposal as incidental to a continuance of the present method, it is too much to pay a guinea for the privilege of imparting instruction to others. I am told I am unpatriotic for this, forthwith. Surely this Association was not intended for those blessed with long purses.

I always thought it such an admirable institution because it brought its advantages within the reach of all. Why should these advantages be denied to those who may be equally deserving, but who have the misfortune to possess short purses? I must protest against any attempt to make this Association exclusive as a grave error, to be attended with the most disastrous results.

It surely does not follow that because a man happens to have scanty means he ought not to try and become an architect. But there are those who argue thus, deeming it a good thing to get rid of others who either cannot or do not care to pay an extra 10*l.* 6*d.* It is idle to say

that such a one has no business to enter the profession. These remarks I intend to apply as much to the present as the future, and I do hope this ill-advised proposal will die a natural death.

I have no time to deal with alterations to the Rules, except with the one relating to voting.

It certainly cannot be right to deprive a man of a say in important matters concerning the conducting of the Association simply because he cannot get to the meetings.

The principle of voting for all members by means of ballot papers is admitted in respect to one important matter, viz., the annual election of officers. Then why not in other cases? It ought to be out of the power of a clique—a mere handful, may be—to dominate the affairs of the Association. This was exemplified last session when half a hundred members out of over 1,100 passed resolutions involving the most radical changes in the working of the Association. I take it that the alteration of this rule as to voting is a very urgent reform, which I hope to see adopted.

Before closing, may I reiterate the able plea put forth a fortnight ago for "craft" education? It requires no words from me to convince you of its importance, and, curriculum or no curriculum, I trust facilities will be speedily afforded.

And now, sir, I have finished my ungrateful task. Ungrateful, because I have to oppose and criticise the views of those whose efforts are tending in the same direction as my own—the lasting good of the Association and the maintenance of its high reputation.

We have an excellent, if somewhat pedantic, motto. May I add to it "Let well alone"?

#### Mr. Owen Fleming's Paper.

We shall shortly be called upon to give the final vote upon a question of greater importance than any that has yet been considered by the Architectural Association, a question upon which our future depends; and yet I am afraid there are many among the 1,129 members of the Association who, from various causes, have even yet an imperfect appreciation of the nature of the question they are called upon to decide. It has, therefore, seemed to me that I may do some humble service if I try to help those to whom I have referred in their desire to arrive at a sound and accurate judgment by placing before them, as clearly and as logically as I can, the influences which have caused this great movement, proceeding then to consider the adequacy of the scheme proposed by the Committee to meet the alleged needs, and after examining into its financial prospects, endeavour to estimate its ultimate effect upon English architecture.

(a) *The Causes of the Educational Movement.*—The influences which have led to the inception of the scheme suggested by the Committee seem to be of two principal kinds, those internal and those external to the Association, although it is not always easy to determine under which of these heads a certain specified influence should be classed.

Perhaps the most important of the internal influences is the great and growing dissatisfaction of the students working in the Classes at the disconnected character and superficiality of the instruction imparted. Although our Visitors deserve our very warmest thanks in coming here, often at great personal inconvenience, to teach their fellow-members what they have learned by hard experience, yet the system under which they labour minimises to a great extent the value of their information. A Visitor is usually totally ignorant of the nature and extent of the teaching previous Visitors have given, and, in consequence, not only is the train of thought in the Class continually being diverted, but frequently most important matters are entirely unconsidered by the class,—an omission which is scarcely compensated for by the fact that frequently the same question is treated by two Visitors. Another feature of the visitatorial system which has given rise to the dissatisfaction in the Classes is, that personal interest between the teacher and the taught is almost impossible. A Visitor on taking a Class before him can hardly be expected to discern the characteristics of the individual student in a single evening, and beyond, perhaps, the lectures, there is little that enables him to feel for and with his students; yet without this feeling of personal sympathy, Classes and lectures are, at the best, but cold and dreary functions. To this want of fellow-feeling may, I venture to think, be



ascribed the inevitable and rapid dwindling of nearly every Class as the session progresses, and the total lack of that enthusiasm which we rightly look for in classes of young students, and without which good earnest education is impossible. Unfortunately the individual student can do but little to alter what he knows to be wrong. He can grumble to his fellows, and those who mix unreservedly with the younger students will bear me out when I say that he *does* grumble, and then he can do one of two things—continue as best he can in the Classes, or leave them altogether; and I fear there are not a few who choose the latter course. It was only when the students of the two junior construction classes met together one vacation evening, some time ago, and expressed the views of their kind in a petition to the Committee, that the inquiry was ordered which gauged the depth of the feeling, and which ultimately led to the preparation of the education scheme we are now considering.

Another influence which has exercised for some time the minds of the elder workers in the Association is the knowledge that there is no connected train of thought permeating the education system of the Association. If I may venture on a simile, I would liken our course of instruction to an Act of Parliament conceived originally for the needs of another generation, but which has received continued additions and amendments to fit it for new necessities. So it is with our educational system. It is an unconnected concourse of atoms rather than one whole, and, following our simile, as it becomes necessary at certain intervals to thoroughly revise and consolidate an Act of Parliament and its amending Acts, so it has become essential to revise and consolidate our educational scheme, making it thoroughly definite, sequential, and intimately connected together.

Passing now to the chief external influences which render a change necessary, by far the most important is the recent development of the Institute scheme of Examination. Examination is good or bad in direct ratio to the quality of the education that has preceded it. If the education is thorough and complete, the examination takes its proper subsidiary place as a means to an end; but permit the education to flag, or to be hastily or imperfectly imparted, and the examination immediately becomes the end in itself, and wields its usurped power with such intense severity that education soon becomes altogether demoralised, and assumes the form known as "cramming." And, therefore, gentlemen, we must take the greatest care that our education is not hastily or imperfectly imparted.

Another influence may, I think, be found in the tendency in certain quarters to regard the Association and its teaching as a temporary expedient pending the establishment of some new collegiate body. Our ex-President, Mr. Gotch, has stated that he for one should not be satisfied till the functions now fulfilled in a voluntary way by the Association should have devolved upon a body representing the whole profession. More than that, some of the speakers at the Conference of Architects our President referred to went so far as to outline a programme for this new institution that seemed needed. Is not this some reason for commencing with ourselves?

There is yet another influence which it will not be wise to neglect or under-estimate in considering the future of the Architectural Association. The educational institutions known as Polytechnics mostly have a class or classes for the study of Building Construction, at extremely low fees. These classes are generally founded upon the South Kensington lines, and therefore treat of building construction as a complete science in itself, and not as it really is, an integral and inseparable part of the great art of architecture. This training naturally engenders a habit of inartistic thought in the minds of those under its influence, and it is desirable, therefore, to discourage architectural students attending these classes by making our own equally thorough, business-like, and practical, but, in addition, preserving the necessary interdependence between them and their correlative classes or lectures.

Did time permit, it would be an interesting and profitable task to continue our analysis further, but we have, I think, examined the question sufficiently to see that there is an extraordinary combination of influences at work upon the Association at the present time, and that these influences, one and all, are tending

to impel us to modify our existing policy; and further, we see that those who hold that the present movement is of an artificial character, or that it is not of sufficient importance to demand our serious attention, are occupying a position which, if persisted in, may result in serious harm to the Association.

(b) *The Adequacy of the Committee's Scheme.*—Those who have given a careful and earnest consideration to the education question are probably by this time of the opinion that the one essential feature in any successful amendment scheme must be a thorough revision and expansion of the curriculum. Unless this difficulty is attacked, it will be futile to attempt reform, but a programme which comprises a liberal curriculum, originally well considered, and afterwards well administered, contains in itself the elements of success; and one of the reasons why I am sanguine of the success of our new schemes is that it is firmly based upon a well-thought-out curriculum. It is singular that amongst the storm of criticism aroused by the education proposals, hardly a word has been said against the curriculum. It has been urged, and justly urged, that its scope might be extended so as to include some manual instruction in the various handicrafts, but it is impossible to do everything at once; and the Committee, although alive to the great and growing importance of this subject, hardly felt justified in overburdening their scheme at first by including such matters as these, entailing as they would a considerable financial outlay.

The Committee, however, apart from this workshop practice, felt it desirable that the curriculum should be complete in itself, with the various individual Classes very intimately connected, working harmoniously together, and forming one whole under one direction and management; and it will be at once seen that, holding these views, they were unable to recommend what is called the "taking advantage of existing institutions." It would be impossible to utilise advantages presented by external institutions without yielding up, to a great extent, the control over the particular class and classes taught elsewhere; and I need hardly say that a system of dual control would be fatal to any ideas of unity and solidarity. Of course we ought to use to our utmost the priceless treasures at South Kensington, Tufton-street, and the British Museum.—far more than we do at present; and if any arrangement could be made whereby we could obtain the occasional use of one of our excellent metropolitan engineering laboratories, it would be altogether good. But to go further than this would, I am convinced, be a fatal mistake.

Having fixed the curriculum and made up our minds that it shall be thoroughly taught, it will be found that the remainder of the scheme follows as a natural sequence. Some criticism has been caused by the number of attendances and amount of work imposed on the students, but it must be remembered that ours is an arduous profession, and entails hard work. Besides, if a student is so fortunately situated as to be able to spare his afternoons for Class-work, he will have no occasion to grumble. It is the hope of many besides myself that day classes may gradually supplant evening classes altogether, as it is not right to make students work from nine in the morning to nine at night. Under existing circumstances, however, the Committee thought it desirable to make the whole curriculum available to evening students. Some exception has also been taken to the payment of teachers, but the objectors could hardly have understood the extent of the proposed curriculum, which it is quite impossible to successfully carry out with voluntary effort. The amount of fees to be paid by the students has also been objected to, but this will be better considered in our third division.

(c) *The Financial Prospects of the Scheme.*—The financial questions involved in the proposed scheme are necessarily of some magnitude, but as the figures were only arrived at after careful investigation, and were based upon a sound economic principle, I do not think they can fairly be termed illusory or optimistic.

The leading principle to which I have referred is that the whole of the *current expenses* of education, such as lecturer's fees and materials consumed by the students, should be borne by those for whose benefit they were incurred. It is not fair that those who have passed their student days, with their accompanying expenses, should be taxed for the

benefit of the education of their fellows; and it will be found upon consideration that in the Committee's estimate no charge is imposed upon the Association in its corporate capacity for the direct education of its students, each of whom is charged a sufficient fee to cover the expenses of his education. It has been held that this fee of 10*l.* 10*s.* per annum is excessive, but I do not think this view can be maintained when it is understood that for this sum the student receives no less than eighty lectures and sixty-four evenings of studio instruction from men whose capabilities prove that they deserve to hold the positions of responsibility which they occupy. Nor can it be said that the Committee have been other than extremely cautious in their estimate of numbers. At the present time about one hundred students annually enrol their names as members of the Association, and yet, under the changed conditions, the Committee estimate that the educational system will progress smoothly and harmoniously if only twenty-five students annually take up the whole course. There is little doubt that this is a low estimate, and that the attractions of the new scheme will draw a much larger number; but even if it be not so, it is surely sounder policy to educate thoroughly twenty-five students than to cover with a superficial gloss of knowledge four times that number.

While I have been saying this, however, a question has been probably forming itself in your minds, and it is this: Why, if the Committee declare that no extra funds are wanted for the education of the students, are we asked to double our contributions to the funds of the Association? This is a very pertinent question, but the answer is simple. In most, if not all, other educational institutions no expenses are incurred on account of the buildings. Either heavy endowments or a generous donor have rendered any annual payments upon this score unnecessary; but it must be understood, and the sooner the fact is grappled with the better, that we have neither heavy endowments nor a Samson Fox, and how are we ever to hope to provide the necessary accommodation for our proposed development if we do not supply funds for the purpose? The Committee have placed apart the sum of 250*l.* per annum for extra accommodation, but I fear they have been over sanguine as to the cost of the instruction,—more particularly in the studio,—and that a considerable portion, if not the whole, of this 250*l.* will be absorbed for this purpose. In any case, the cost of the building accommodation is certainly a matter for the Association in its corporate capacity. This accommodation will at first have to be temporary, but ultimately we must be housed in a suitable permanent building, fitted with the necessary studios, lecture-theatres, class-rooms, &c., and, I hope, workshops for the handicrafts,—a building, in fact, worthy of the central educational institution of the profession of architecture in the richest country in the world. To attempt to carry out the proposed scheme of education in our two or three little rooms upstairs would be simply to court ridicule; to throw the burden on the shoulders of the young student passing through would be unmanly and unworthy of the Association; to wait till the Institute, or a conference of architects, or the general public, agree to advance the money, would be to convert our scheme into a mirage. So what is to be done? The answer comes straight and direct,—bear the burden ourselves, and let the world see we mean business. Gentlemen, I ask you to give this question your most earnest consideration. You have an opportunity before you of placing once and for all the education of English architects on a firm and sound basis. You have practically in your hands the character of our national architecture of the future, and I do earnestly plead with you not to be influenced by feelings of personal selfishness, but rally to the occasion, as the Association always has rallied to the occasion, and agree, not grudgingly, but gladly and unanimously, to supply the small amount of extra funds you are asked for to enable this great reform to be successfully carried out.

(d) *The Ultimate Effect of the Scheme on English Architecture.*—I cannot pretend at this late hour to do much more than briefly indicate the manner in which the proposed scheme will affect the architecture of the future. The architecture of the present we know too well. We have only to stroll down our latest metropolitan improvements,—Shaftesbury-Avenue and Charing Cross-road, or to go



for a walk through the outskirts of London, or any country town, to find building after building totally devoid of any architectural interest whatsoever, bad in massing, bad in proportion, bad in construction, bad in sanitation, and an ever-present monument to nineteenth-century ignorance, otherwise called bad taste. Let us not fall into the mistake of supposing that architectural design is a gift, and not obtainable by those who do not possess it. We should consider it an intolerable presumption if a man, ignorant of the elementary laws of harmony, attempted to compose a Cantata, or if a butcher sought to perform a delicate surgical operation; but their jumbles would not be a wit worse than the atrocious compositions that we are daily compelled to witness.

And yet it is hardly fair to blame the architects who continually perpetrate these false quantities. We must rather blame the system which deludes the innocent student into a belief that he can learn, perhaps, the most intricate and far-reaching profession of modern days in a three years' pupillage by having the run of a small practitioner's office. We limit the chance of progress in every possible way, and adopt the very best method that ingenuity can devise for stunting and retarding the growth of the artistic faculties, and yet we are foolish enough to expect our nineteenth-century architecture to improve.

No; if we are really in earnest in our desire to raise up a national school of highly-trained scientific architects, we must see that they are properly educated; that their environment is one which will stimulate into healthy growth, instead of stifling the young artistic perception. And if our endeavours to deal in a masterly manner with the great problem of education prove successful, as there is every reason to hope they will, we may then be able to seek some other, not for mere registration or examination, but for a compulsory education which is more serviceable than a mere statutory law-making; and then, and not till then, may we look forward to a national school of architecture as highly skilled and as efficient as is our national school of medicine at the present day. The briefest recapitulation and I have done commenced this address by showing to you how many influences there have been at work making it essential, if the Association is still to go forward, for it to modify its present scheme of teaching. We examined one by one the important influences, and incidentally referred to others, and, I think, felt that it would be safe to further postpone the consideration of this vital question. We then considered the nature of the reforms proposed by the Committee, and, after finding that the key to the situation was an amended and expanded syllabus, saw the importance that had been given to this in the Committee's report. Wealing then with other minor matters, we passed to finance, found that the least judicious principle was a thoroughly sound one, and felt that the Committee had been temperate and judicious in their estimates, and that there was every probability of the estimate proving reliable. We saw the extreme necessity of raising our own contributions to ensure a satisfactory execution of the scheme of education, and concluded by endeavouring to estimate the nature of the influence which the new scheme would have upon the future of English architecture.

Mr. H. O. Cresswell proposed a vote of thanks to the authors of the four papers,—gentlemen so well qualified to express their views on this subject; but he thought that if each member, after hearing the opinions of others, would carefully consider the question for himself and in his own conclusions, it would be to the advantage of them all when they came to vote on the new rules, as they would shortly be called to do. It seemed to him the papers might be divided into two groups,—those which are satisfied with the present state of affairs, and those which were not. Mr. Needham Wilson said Mr. Pite saw a great deal to admire in the present system, and wished to continue it, if, exactly on the present lines, at all events very much on the present lines. Mr. Millard said Mr. Owen Fleming, on the other hand, did seem to approve of the present system at all, and thought that they ought to have the benefit of the most radical description. Mr. Johnson had referred to the very large expense which was incurred every year for the convention and the soirée. The Committee were

entirely in accord with Mr. Wilson in thinking that the expense was more than they could afford, and the matter had engaged their serious attention for two sessions, as being a constant item in every balance-sheet. He (the speaker) was in favour of the proposition that the expense of at least one of those entertainments should be borne by the members attending it. Mr. Wilson had also referred to the arrears of subscriptions, but he must not imagine that the same arrears were being carried forward for several years,—though the amount was generally about the same,—the truth being that the amount which appeared in each year's balance-sheet under the head of "arrears of subscriptions" merely represented the amount which happened to be due at that time, and probably the majority of those then due were paid off in the next few months.

Mr. E. Doran Webb (Salisbury) seconded the vote of thanks.

Mr. F. R. Farrow said he would like to ask Mr. Needham Wilson whether certain men whom they knew in their profession were architects; because he had said that academic training did not and could not produce architects. Did he consider that M. Charles Garnier, the designer of the Paris Opera House, was an architect? Did he consider that the late Alexander Thomson, of Glasgow, who did so much to show what could be done with Greek architecture in modern work, was an architect? Did he consider that the late H. H. Richardson, of America, who invented an entirely new treatment of Romanesque, was an architect? And did he consider that Mr. Norman Shaw was an architect? All those men had received an academic training.

Mr. Pite suggested that Mr. Farrow's questions were questions for the Institute Examination.

Mr. Farrow thought they were questions which might be put to the Institute very well.

Mr. Wilson said that the four architects whom Mr. Farrow had mentioned were architects despite their academic training.

The Chairman (Mr. Leonard Stokes, President), in putting the vote of thanks to the meeting, said that Mr. Pite had said very rightly that an architect should be an artist first. So he should; but that did not prove that he should necessarily be an ignorant artist.

The vote of thanks having been put and carried unanimously,

Mr. Pite, on behalf of the four readers of papers, briefly replied, and the meeting terminated.

#### Advanced Class of Construction and Practice.

—At the meeting on Wednesday evening Mr. Francis Hooper read a paper on "Artisans' Dwellings," dealing chiefly with the principles governing their arrangement. The discussion was opened at some length by Mr. Owen Fleming, and the points raised by him and Mr. Hooper were deemed to be of such importance that the further discussion was adjourned until November 26, when it is hoped that several representative officials conversant with the question will be present.

#### BUILDERS' BENEVOLENT INSTITUTION: ANNUAL DINNER.

The forty-third anniversary dinner in aid of the funds of this Institution was held on Thursday evening, the 6th inst., at Carpenters' Hall, London Wall. Mr. Wm. Shepherd, the President of the Institution, occupied the chair, and was supported by Mr. George Plucknett, J.P., (Treasurer of the Institution), Mr. Rowland Plimbe, F.R.I.B.A., Mr. T. F. Rider, Mr. B. J. Jacob (Warden of the Carpenters' Company), Mr. McInnes, Mr. Peters, Mr. W. Brass, Mr. Stoner, Mr. A. Ritchie, Mr. C. Russell, and the friends of the Institution, the company numbering about 150.

The Chairman gave the toast of "Her Majesty the Queen, the Prince of Wales, and the rest of the Royal Family." The Chairman also gave "The Army, Navy, and Reserve Forces," Major Brutton responding for the Army and Navy, and Sergeant Thomas Stirling for the "Reserve Forces."

The Chairman, in proposing the toast of the evening, "Success to the Builders' Benevolent Institution," said it was forty-three years ago since several gentlemen interested in the matter met and laid the foundations of this deserving charity. It was the bounden duty of the successors of those founders to hand it down unimpaired, and to maintain its efficiency. The tree had borne considerable fruit already, for no fewer than 120 male and 68 female pensioners had enjoyed the benefits of the Institution. At the time of the issue of the last report, there were 26 men and 39 women on the roll of the charity. Those who had conducted

the Institution had from time to time entertained more ambitious views than they had been able to give effect to, such as the establishment of almshouses; but such schemes had been put aside for want of the necessary funds. To pay the present pensioners about 2,000*l.* was needed yearly, besides the necessary expenses for conducting the charity. The object of the Institution was to help those who had been unsuccessful in business, and it was an astonishing thing that so many connected with the building trade took so little interest in this Institution. The building trade was one which was surrounded with great vicissitudes; in fact, there was hardly another business attended with so many conflicting elements. It was therefore of the utmost importance that the members of the industry in the Metropolis, who had been compelled to give up the struggle, through no fault of their own, should have some other resource than being declared paupers, and being associated for the remainder of their lives with persons who had never tried to make headway. It was strange that those who had always been farthest removed from such a contingency had been the greatest supporters of the Institution. At the same time, he was sorry to say that a large number of firms and individuals connected with the trade, and who were doing a lucrative business in the Metropolis, had never contributed a shilling to the funds of the charity. In this Institution the danger of indiscriminate charity were reduced to a minimum, as every case was personally investigated by the Committee. After some further remarks, the Chairman coupled the toast with the name of Mr. George Plucknett, J.P., the Treasurer.

The toast having been duly honoured, Mr. Plucknett replied on behalf of the Institution, which he believed was doing its duty according to the intentions and objects of the founders and subscribers. The great drawback was the want of sufficient money to provide for all those who sought its benefits. It was a remarkable fact that in the area which the charity covered there were something like 5,000 builders, besides thousands of others engaged in trades connected with building; yet out of all that number, only 500 subscribed to the Institution. At the same time, the Committee were grateful to the consistent subscribers, and to the present President for his anxiety to help the charity.

Mr. J. W. Duffield gave "The Worshipful Company of Carpenters." The Institution, he said, was very much indebted to the Carpenters' Company for the use of their noble hall, and for the substantial donation they gave to the funds.

Mr. B. J. Jacob (Warden of the Company) replied. The carpenters and builders, he considered, were so closely allied that if one trade suffered the other suffered also. As long as he had a voice in the direction of the Company he would do all he could to aid the Institution.

Mr. T. F. Rider, in a humorous speech, proposed "The Chairman and President." Mr. Shepherd, he added, was a man who was respected by the trade, and who carried out a large amount of work, doing it, at the same time, honestly and well.

The toast was most cordially received, and the Chairman made a suitable reply.

Mr. H. Ashby proposed "The Architects and Surveyors."

Mr. Rowland Plimbe responded, and said that an architect who was properly trained, and knew his business, must look upon his position as being that of one who held the scales between the client and the contractor. He believed that if the relations between architects and builders were carefully considered, there should be no necessity for any disputes.

Mr. Arding also replied on behalf of the Surveyors.

The remaining toast, viz., "The Vice-Presidents, Committee, and Stewards," was proposed by Mr. A. Richards.

In the course of the evening subscriptions and donations to the amount of 827*l.* were announced, of which sum 615*l.* appeared in the President's list.

#### A SCARIFIER FOR MACADAMISED ROADS.

MANY of our readers will no doubt have lately seen the macadam scarifier, which has recently been working on the Victoria Embankment, and in Hyde Park and various other places in the Metropolis. This appliance undoubtedly possesses several advantages over the old system of breaking up our roads by hand-labour. The inventor of the scarifier (which when in use is drawn by an ordinary horse power traction engine) claims for it that the work can be done at less than half the cost of the old method by pick-axe, even when done in the most economical manner. But this work, as must often have been observed, is generally done by old and infirm men far too weak for work so laborious, and who are not able to pick up the road to a uniform depth. By the use of this machine the depth can be made from 1½ in. to 3 in., as required, by working a single and simple part of the apparatus, which raises or lowers the steel tines which plough up the road. By its use, too, every stone is completely shifted, although there is no danger of the stones flying



about, as so commonly happens in the old method of hand "picking," with the result of leading to accidents and expense.

The scarifier is complete in itself, and does the work in far less time than is possible by manual labour. We understand that it will do from 2,000 to 2,500 superficial yards in an ordinary day of ten hours. It can also be used by night equally as well as in the daytime,—a great advantage in our busy streets, which, when this work is carried out, are too oftentimes closed to the traffic longer than necessary. The inventor and patentee is Mr. G. G. Ratty, of Bromley-by-Bow, London, a well-known contractor for paviors' and masons' work. We witnessed the machine at work in High-street, Poplar, on Monday last, and the ease and celerity with which it accomplished its work appears to fully justify all that is claimed for it.

### Correspondence.

To the Editor of THE BUILDER.

#### CEMENT TESTS.

SIR,—Mr. Roechling's letter in your issue of the 1st inst. [p. 348], giving a translation of the German standard rules for the delivery and testing of cement, calls for some notice, for although these regulations are, no doubt, suitable for the country in which they were framed, they are certainly not applicable to our practice here, and if generally adopted would undoubtedly lead to many difficulties and misunderstandings.

With respect to the part relating to the packing and delivery—it is purely a commercial matter, and I have nothing to say either for or against it. Here a sack of cement is supposed to weigh 200 lbs., and we have, as a rule, two sized barrels, one weighing 400 lbs. gross, and the other 400 lbs. net, i.e., about 427 lbs. gross. The barrel trade is entirely a shipping trade, and the size of the barrel depends on the market to which the cement is consigned.

I would, however, more particularly draw attention to the test for tensile strength, and the test for "blowing," i.e., the determination of the soundness of the cement.

If only for three reasons, the sand test is an impracticable test—1. a standard sand has to be procured; the late Mr. Grant, who was a great believer in this test, found a sand at Leighton Buzzard which answers the purpose very well, and on the rare occasions when I have to make a sand test, I use it, but it is not always uniform in size and form of grain, and has to be very carefully washed and sifted in my testing-room before being used; and furthermore, it does not bear the official stamp, as does the standard sand, or grit, which is supplied by the Government laboratory at Berlin. Another and greater difficulty is that not one man in ten, who is otherwise a good cement-gauger, can satisfactorily gauge a sand or grout; there is a knack in manipulation which is difficult, and to some impossible, to acquire, and hence results by different operators with the same cement do not agree, and but little reliance can be placed on them. But the third and most serious objection is, that we cannot wait four weeks to know the constructive value of a cement. Whether it be for shipment or for use in a contract here, it is only on rare occasions that the cement can be allowed to remain in bulk for the four weeks during which the test is being carried out, and which means actually five or six weeks, before it is either accepted or rejected.

The German test for "blowing," i.e., soundness or freedom from expansion or contraction, I am obliged to say, is an absolutely delusive one. I tried it for quite a year in my testing-room with several hundred samples of different cements, and obtained no satisfactory and decided results from it. My reason for giving this test such a severe trial was that some years previously I devised a test for the same purpose, but, as the German one seemed simpler, I was prepared to abandon mine if the German test gave satisfactory results. It is some ten years since I first devised this test, and some six years since I began to make it public, and all I can say about it is that during the whole of that time it has never once deceived me. I enclose a few notes on cement testing and sampling which gives a description of it, and for further particulars I may refer to the new edition of "Portland Cement for Users," published by Messrs. Crosby Lockwood & Co. I may add that there is no patent in it, and anybody and everybody is free to use it.

I have always maintained that if a cement proved to be sound, and satisfied the general conditions of a cement when gauged with water, it was in ninety-nine cases out of a hundred strong enough for the work for which it was intended to be used, and my practice is to test every sample of cement immediately it comes into my testing-room for soundness. I can then, if necessary, in the short space of twenty-four hours, advise definitely whether or no the cement may be safely used; and everybody,—engineer, contractor, and cement-maker,—will admit that this is an advantage which cannot be over-estimated.

I may add that I received a copy of the German regulations some three years ago—i.e., on their publication, and had I found any part of them worthy of imitation I should have felt it my duty to have made that part public; but, as I have before stated, I am not of opinion that these regulations and tests are best suited to our practice here. We have no governing body to regulate the quality and properties of the material we buy and sell as cement. Years ago I tried to induce the cement-makers to agree to a standard test, but I failed lamentably, and perhaps it is as well that I did. But, though not supporting these German regulations and tests, I am quite prepared to admit that the Germans have done a great deal for the cement industry, and by individually carrying out a vast number of experiments have induced and fostered an improved manufacture, but they have to a very great extent stultified the value of their experiments and tests by a too strict and almost bigoted adherence to the purely scientific and theoretical side of the subject.

HENRY FAJIA, M.Inst.C.E.

November 3, 1890.

SIR,—With regard to Mr. Roechling's letter in the Builder for November 1 [p. 348], giving the Prussian standard rules for cement testing, the latter would appear to be almost identical with those laid down by the Metropolitan Board of Works in 1886, and, I believe, continued by the London County Council. The fineness and residue are exactly the same, but the Prussian test is 227 lbs. tensile strain, as against the Board of Works' 250 lbs., the relative proportions of sand, and cement, and age being alike. The rules of the Prussian authorities as to "blowing" are those recommended by Mr. Grant, Mr. Fajia, and others, years since, so that possibly the Prussian standard tests of 1887 were adapted from the Metropolitan Board of Works' tests of 1886. At any rate, the latter were the outcome of many years' experience and many thousands of experiments, and might well be recognised as a uniform standard for high-class cements.

It is worth noting that Mr. Grant, as engineer for the Board of Works, made a large number of experiments, in the years 1861 and 1862, with cement mixed in various proportions with sand, and the average of many tests subject to similar conditions to those stipulated by the Prussian authorities, viz., 1 of cement to 3 of sand, only gave, in 27 or 28 days, a tensile strain of 108 lbs. on a section of area of 2½ in., the requirements now are 227 to 250 lbs. per superficial inch.

The Forth Bridge contract stipulated that 1 part of cement and 3 parts of sand should withstand a tensile strain of 170 lbs. per in. in 24 hours; the Metropolitan Board of Works' test in 1869 only required a tensile strain of 175 lbs. on neat cement of the same age. This remarkable increase of the capacity of cement to amalgamate with sand to form mortar, suggests whether the time has not arrived when for ordinary building purposes it may not take the place of lime. As a matter of fact, measured by strength, Portland cement is now cheaper than lime, and although specifications for building contracts, as a rule, I believe, require the same amount of sand to cement as formerly, a very much larger proportion of sand could be used, and yet make a first-class mortar. THOMAS POTTER.

Alresford.

#### BETHNAL GREEN SLUMS.

SIR,—Apropos of the necessary remodelling of the neighbourhood of Columbia- and Virginia-roads by the clearing out of so much that the continuation of these roads into the High-street of Shoreditch could be effected at a very small cost, and as no more favourable opportunity than the present can occur for about another century, I would like to put the question publicly, through your valuable medium, What are the local authorities about to allow the new\* dwellings (now about to be erected) to have such a large frontage on this route, and not to set back, at least, 20 ft. from centre of the road? In our suburbs,—often laughed at on account of their insignificance,—such would not be tolerated

\* Guinness's dwellings.

(not even for a local somebody), as they would pay compensation if it could not be done without it. Surely there is something wrong, as everyone knows by this time. Given good wide thoroughfares, and much of the objectionable character these neighbourhoods sink into will be changed. Here is an opportunity: about three-quarters of a mile, mostly of good width, but cramped at each end, and now no time to be lost. Whoever heard of such a thing? A big block, perhaps five or six floors high, and yet the roadway at one end, speaking without measuring, I have no hesitation in saying, including footpaths, under 20 ft. wide, the other end perhaps 5 ft. wider, though I doubt if 25 ft. True, there is a thoroughfare of 30 ft. or 35 ft. running into this at the wider end, but what is that in, perhaps, 400 ft. of frontage?

I trust the publicity of this will find out the way to not only initiate, but to complete, the whole of this much-needed improvement.

A CONSTANT READER.

#### "DEATH IN THE VENTILATOR."

SIR,—I have pleasure in endorsing the remarks of Mr. Buchan in your paper of last week [p. 372] with respect to the fixing of a mechanical ventilator provided with a balanced valve so constructed as to be closed by a moderate blast of wind at top of soil-pipe. I, too, must denounce this as being quite against all that has been done to prevent syphonage of the w.c. traps. In the first place, it would soon get out of order, and, provided it got fixed open to its full extent, so much the better. A moderate blast of wind would partially close the valve, and the sucking-action of the discharge of a w.c. at the time would finish it, resulting, most probably, in the syphonage of the w.c. trap, even were the latter ventilated. Those who fix these will have the pleasure of removing them at no very distant date—at least, I hope so.

Bristol.

MOSS FLOWER.

### The Student's Column.

HOT-WATER SUPPLY FOR BATHS, LAVATORIES, &c.—XIX.

IMPROVED SYSTEMS (continued)—COILS AND COIL SERVICES.

AN instance of a descent in circulating pipes to which no objection can be raised is when it becomes desirable to carry a returned draw-off service close to the tap. It has been the general practice when returning draw-off services to connect the returned portion at the point where the pipe turns down to the tap, as fig. 47, leaving some

FIG. 47.

6 or 8 ft. of single pipe in which the water lies stagnant; this in many instances is not very objectionable, but, should it be desired, the pipe may be returned from a point close to the tap as fig. 48, and the circulation under this arrange-

FIG. 48

ment will be very good; or where the pipe rises to the tap, as fig. 49, the circulation will be found quite perfect. In the case of a lavatory basin, it is always a satisfaction to find hot water issuing immediately a tap is opened; the majority of these have but small taps, and annoyance is always experienced here if any cold water has to be drawn off before the hot arrives.

As a general rule, there is only one objection to dipping the circulating pipes (provided the



lip is not a very deep one), which is, that it probably leaves some portion of the pipes as at fig. 46 (see p. 349, *ante*), and the disengagement of the confined air will give in-

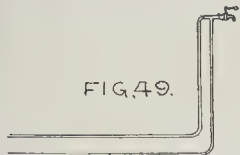


FIG. 49.

finite trouble, and, on this account, any plan of carrying the pipes in irregular directions requires considerable thought before being put in practice, for it must be borne in mind that a collection of air in pipes will quite impair the efficiency of the apparatus and bring about noises and erratic results. In a heating apparatus, air-cocks for releasing confined or collected air figure very prominently, as they require fairly regular use; but a heating system is commonly under the care of some one who has a knowledge of the air-cocks and their use, which cannot be looked for from the maidservants in an ordinary residence.

In completing this paper, there is a feature in the cylinder system which has not been mentioned before, but which is of considerable importance in rendering general good results, and this is the insertion of a stop-cock in the secondary return, which should be closed at night to stop the circulation and so retain the store of warm water in the cylinder (which is usually in a warm position), and which can then be relied upon to provide a tepid bath before the fire is lighted in the morning. If the upper circulation is not stopped, we have the water travelling around the house dissipating its heat in all directions, to no purpose, as the circulation will not cease of its own accord until the water is cold.

The best position for this tap is in the kitchen or somewhere where it can be easily used, as fig. 50; no harm can ensue, as, should it

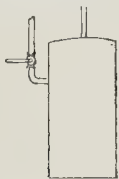


FIG. 50

be left closed, it only converts the secondary flow into an ordinary single-rising main, and the effect is that a quantity of cold water would have to be drawn before hot was obtained in the morning. If the cock has to be put near a ceiling it can have a cross-key with cords or chains, as fig. 51.

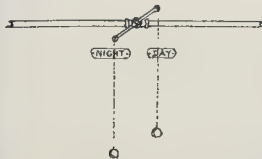


FIG. 51.

#### COILS AND COIL SERVICES.

The attachment of a small quantity of hot-water pipes or a coil or radiator to a supply apparatus is much in vogue, but it is really not a practice that can be recommended very strongly unless special circumstances render it necessary. In the first place, a coil service and a supply service for draw-off purposes are directly at variance with each other in the objects that they are intended to attain, as with the former the sole aim and purpose is to radiate, dissipate, and transfer the heat from the water to the air; whereas with the latter every effort is usually made to conserve the

heat within the pipes, so that it may all be had with the water from the taps, and not to diffuse it with a proportionate reduction in the temperature of the water; consequently, if a heating appliance of any description is connected on to an existing apparatus, a reduction in the quantity or the temperature of the hot water must be anticipated; or, if we include such an appliance in a new apparatus, we must, of course, put a boiler of a power more than sufficient for the taps only.

It is very commonly desired to heat a small greenhouse or conservatory by one or two pipes heated from the kitchen boiler, and this arrangement is just as commonly carried into effect; but it has a most fatal objection, which is that when the heat is most needed, in the early morning hours, the fire is out and the water cool. This objection is not so noticeable with a coil in the house, as the loss of heat brings about no serious harm and no particular inconvenience at night, when the occupants are at rest; but, at the same time, if the coil was in connexion with a stove that kept the fire going all night, a good deal of comfort would be felt from the warm temperature in the early morning, when the cold is greatest and felt the most.

If the kitchen range has a convertible open and close fire, this goes far towards overcoming the difficulty just referred to, as an open fire, if fed the last thing at night, will frequently remain burning until morning, and, although the combustion is slow, it keeps up the temperature very well, as but a small fire will do this when no water is being drawn off.

In concluding the objections to the arrangement now under discussion, it should be mentioned that a boiler which is sufficiently powerful to give a good supply of hot water and satisfactorily work the heating appliance in winter will probably prove a source of worry in the summer by furiously overdoing its work, as the coil would be then shut off and the demand for hot water considerably diminished.

The oldest form of coil is that having box ends, as, in fact, many are made now, but the joints between the pipes and the box ends were made and secured by a rust, or a composition joint, which was a great source of trouble to make up, and these rigid joints did not do very well, the expansion and contraction brought about occasional leakages, and, under the best of circumstances, the erection was abnormally ugly, requiring an expensive casing solely to hide it. This casing itself introduced two obstacles to the success of the coil, the first being that it obstructed and absorbed a deal of heat; and, secondly, and worse, it made it difficult to keep the coil clean, and it is surprising what a preventative of heat-radiation a coating of dust is, it being composed chiefly of poor conductors of heat (minute particles of wool, fibre, straw-like materials, and stone grit).

More recently two or three forms of expansive joints (the packing medium being a rubber ring or collar) have come into use, and are a decided improvement, as, although costing a little more, the joint does not give way, and the labour of erection is reduced to a minimum. Fig. 52 in

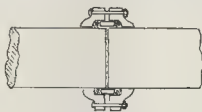


FIG. 52

section is one of the best-known of the joints as applied to two lengths of pipe. It will be noticed that the pipes may have perfectly plain

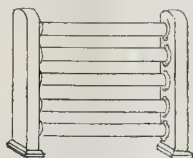


FIG. 53.

ends; no sockets being needed, and if the pipe-ends are a little rough or irregular a good joint can still be made. Fig. 53 shows a coil made up

with this joint, connecting the pipes to the box ends.

#### XX.

##### COILS AND COIL SERVICES (continued).

A MORE recent introduction, which is very suitable for houses, as no casing or other device for hiding it is necessary, is termed a "radiator" (fig. 54). These are now being made in various designs and forms by different manufacturers, and as they can be treated to match the surrounding decorations their appearance need not be objectionable.

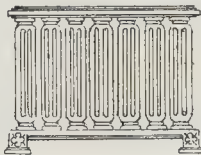


FIG. 54.

The majority of these radiators have the pipes in a vertical position, and an object retained in view by the manufacturers is to give as large a heating surface as possible with the smallest quantity of water, so that they can be heated up quickly, although, of course, they as quickly grow cold when the fire is out; but this is not a serious matter in a residence where the kitchen fire is always alight from 7 a.m. to 10.30 p.m. The small quantity of water is an advantage, as a coil of ordinary pipes which holds so much water is like attaching a second reservoir to an apparatus, and it greatly imperils the efficiency of the boiler, and takes a great deal of time to heat.

As a general rule, it may be considered that two medium-sized radiators is as much as ever should be attached to a domestic supply apparatus; to attach more than this will only be at the risk of rendering the supply of hot water at the taps inadequate in temperature, and it is only when a boiler is more powerful than is necessary for the supply of water drawn off that this can be done.

There has been some controversy as to which gives the best results, a coil or radiator of vertical pipes, or of horizontal pipes. From experiments made it is found that the water will circulate through each at about the same speed, but with horizontal pipes there will be found a difference in temperature between the top and bottom pipes, whereas with the vertical pipes the circulation is regular through all pipes, and it is quite the exception for one pipe to heat differently to the others, supposing no obstruction exists; but it has to be pointed out that with vertical pipes, if air accumulates, preventing the pipes filling right up, the circulation will be checked, but at the same time this only indicates that the air-cock wants opening, which instantly remedies the trouble. A strong point in favour of vertical pipe-coils is that they do not get coated with dust so quickly.

There are various ways of connecting these appliances to the circulating pipes; some on to the flow-pipe only, some on to the return (the secondary return to a cylinder, not the return of a tank system), and some on to both flow and return.

To commence with the first arrangement, fig. 55 illustrates a radiator connected to a

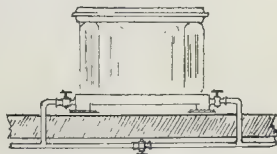


FIG. 55

flow-pipe with a stop-cock beneath to divert the whole or part of the water through the coil as required; if there were no stop-cock at this point the apparatus would still heat, but not so rapidly; and it is usually found desirable to have the cock so that it can be "set" to permit of the coil having a fair share of the circulation without interfering seriously with the house



supply. The setting of the cock is necessary, as requirements differ so greatly, some people needing hot water at a later hour or in less quantity than others, or considering the coil of the most importance; and in some instances the coil is closed off while the cylinder or tank is being heated up, and so on. If desired, the cock beneath can be quite closed, so that all the water has to pass through the coil, which will heat it up quickly, but it must not be expected to have hot water at the taps past the coil so quickly in the morning as when this tap is partially opened; in many cases, however, it can be done, and although the flow of water has to first rise up to the coil and then descend, the circulation will not be impaired. The stop-cocks at the sides of the coil are for wholly stopping off the circulation when not required; two stop-cocks are necessary if the coil is required to be quite cold, or if the coil is provided with a tap to empty it and prevent its rusting when not in use. It will be noticed that the arrangement just explained introduces an objectionable feature, viz., stop-cocks in the flow-pipe.

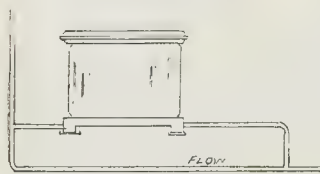


FIG. 56

Sometimes it can be arranged as at fig. 56, by which a little better results are obtained, as the flow-pipe has not to descend; but the gain is so slight that it is not worth while going to a great trouble to effect it.

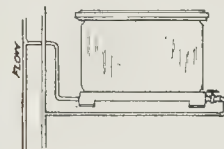


FIG. 57

When it is desired to connect the coil with both flow and return, it is done in a similar way to a returned draw-off service, as at fig. 57 or fig. 58, with stop-cocks, as shown, and this arrangement has the advantage of having no cocks in the primary flow or return services.

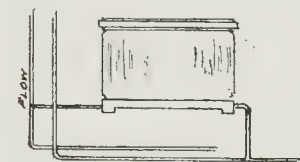


FIG. 58

If a coil is attached to the secondary return of a cylinder apparatus, it can be arranged as at fig. 59, but in this case the cocks can be adjusted to allow the whole of the current through the coil, supposing there are no draw-off taps past it,—i.e., between the coil and the cylinder,—at E, for instance.

It is usually found that if two stop-cocks are not provided for shutting off the coil (one in the pipe to it, and one in the pipe from it) the coil will not remain quite cold, and, although its temperature will not be high, the warmth is usually objected to in the hot summer months, when the least artificial heat is considered intolerable. It is found in the majority of cases that one stop-cock, although closed, does not wholly prevent a feeble circulation setting in up the open pipe, although this is generally aggravated by the stop-cock being placed in the wrong position. If the cock is placed in the pipe that leaves the coil, as shown at fig. 57, the coil will not heat, except to a trifling extent, as we have to remember that, although a slow cir-

ulation will set in up a single pipe, it is next to impossible for it to take place in a directly descending one.

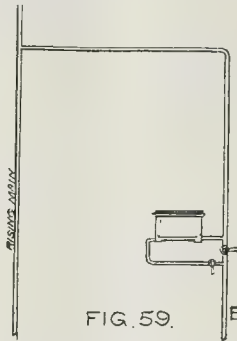


FIG. 59

The radiators referred to are generally supplied by the makers completely fitted, so that the connexion of flow and return pipes is all that is needed. This makes an agreeable improvement over the old pattern coils, which had to have all the pipes fitted and jointed on the premises. Of course, this convenience is paid for in the increased cost of radiators over plain coils.

#### SURVEYORSHIPS.

**SOUTHAMPTON.**—Mr. A. D. Greatorex, of the City Surveyor's office, Manchester, has been appointed Assistant Borough Surveyor of Southampton. Mr. Greatorex served his articles under Mr. J. Price, Assoc. M. Inst. C.E., Engineer and Surveyor to the Toxteth Park Local Board, near Liverpool, and for the past four years has been hon. sec. of the Association of the Manchester Students of the Institution of Civil Engineers.

#### OBITUARY.

**MR. J. P. HOLDEN.**—The death of Mr. James Platt Holden is announced. One of the oldest architects and surveyors in Manchester, he commenced practice in 1838, with his brother, Mr. Isaac Holden (who died in 1884). Born in Liverpool in August, 1806, he served his time and worked as a journeyman bricksetter; then emigrated to America, where he first worked as journeyman; then as builder; and, ultimately, as architect and surveyor. Returning to England in 1838, Messrs. Isaac & J. P. Holden continued practice in Manchester until 1852, when they separated by mutual consent, each continuing on his own account. Mr. James P. Holden held the office of Surveyor to the Dean and Chapter for something like thirty-five years, and of architect to the Cathedral for about twenty-eight years, during which time a considerable portion of the fabric was restored, and the new tower rebuilt. Retiring in 1879, he still retained his connexion with the profession through the Manchester Society of Architects, of which he was one of the original members. He was also one of the oldest members of the Literary and Philosophical Society of Manchester. He has passed away at the ripe age of eighty-five years, and will be remembered by many friends for his kindly disposition and his readiness to assist others in all matters within his power. His nephew, Mr. John Holden, is a member of Council of the Institute.—*R.I.B.A. Journal*.

**MR. WILLIAM STEWART.**—The death is announced of Mr. William Stewart, the Town Surveyor of Rugby. Mr. Stewart, who was articulated to a Rugby architect, succeeded Mr. J. Palmer, the present Surveyor of Malvern, in the office about sixteen years ago. According to the *Birmingham Gazette*, he was thoroughly in the confidence of the Board, and during his surveyorship had designed and carried out several important works—notably, the surface-drainage scheme, the laying-out of the recreation-ground and the cattle-market.

#### GENERAL BUILDING NEWS.

**NEW CONVENT OF THE SACRED HEART, COOKSTOWN.**—The new convent of the Sacred Heart, Cookstown, which has just been completed, was formally opened on the 6th inst. This building has been erected from design by Mr. William Heggie, Dawson-street, Dublin. It consists of three stories. On the second floor are the cells or sleeping apartments of the community. The lavatory, bath-rooms, and hot-water arrangements, together with the electric bells, have been put up by Mr. W. J. Scott. The contract for the convent has been completed by Messrs. McNally & McKee, Cookstown.

**CHURCH OF ST. MARY MAGDALENE, SANDRINGHAM.**—The reopening on the 9th inst., after enlargement, of the Church of St. Mary Magdalene, Sandringham, was attended by the Prince and Princess of Wales. The earliest portions of Sandringham Church belong to the end of the twelfth or the beginning of the thirteenth century. The chancel was rebuilt with a vestry on the north side in 1887. The works just completed consist of improvements in the chancel by strengthening and raising the walls, altering the windows, replacing the deal roof with an oak one, and the erection of a porch over the south chancel door. A specially-designed floor, executed in rustic mosaic, has also replaced the former tiles in the spaces now occupied by seats. A necessary enlargement of the church has been made by the addition of two small transepts, and a new pulpit of carved oak on a stone base takes the place of a stone one put up when the chancel was rebuilt. A rearrangement of the choir seats and the font, a new warming apparatus, and several necessary general repairs complete the work, which has been carried out from the designs and under the direction of Sir Arthur Blomfield.

**ST. JAMES'S CHURCH, TREDGAR.**—The Bishop of Llandaff on the 6th inst. consecrated a new church at Georgetown, Tredgar. The church, which will accommodate 500 persons, is in the Early English style of architecture. The plans were prepared and won in competition by Messrs. James & Morgan, of Cardiff, and the work has been carried out by Mr. Edward Morgan, of Tredgar, whose contract price was 2,200l. The building is divided into nave and aisles by an arcade of arches, supported on Corsham Bath stone columns, with moulded caps and bases, clerestory windows being inserted over the arches. The clerical vestry is situated on the north side, and the organ-chamber on the south side, of the chancel. The elevations are faced externally with blue Bedwellty stone, with grey Forest of Dean stone dressings to the doorways, windows, copings, &c. The west end of the chancel is surmounted by a bell-cot, worked out of Forest stone. The roof is covered with blue and purple slates in alternate courses. Internally the roofs are open to the ridge, and are constructed of pitch-pine. The seating is also of pitch-pine. The pulpit is of Corsham stone and pitch-pine, moulded and carved. The font is of Caen stone, moulded and carved. Both were executed by Mr. Wormleighton, sculptor, of Cardiff.

**MAIDSTONE CHURCH INSTITUTE.**—The formal opening of a new hall, in connexion with the Maidstone Church Institute, to be called the Hollingworth Hall, took place on the 6th inst. The new portion of the Institute is situated at the rear of the building in Union-street. The whole of the basement is occupied by the gymnasium, which measures 51 ft. long by 28 ft. wide, and is paved with wood block paving. A small dressing-room with lavatory, &c., adjoins it. The ground floor contains three well-lighted rooms, approached by a corridor leading from the present entrance hall. These rooms are allotted for library, senior's room, and recreation-room. The recreation-room measures 30 ft. by 20 ft. The upper floor is occupied by the new Hollingworth Hall, which measures 51 ft. by 23 ft., and will seat 300 people. A permanent platform occupies the further end of the hall, and a small retiring-room is provided. An iron external staircase is also provided. The building is warmed throughout by hot water. The building generally is in accordance with the plans of the late Mr. E. W. Stephens, P.R.I.B.A., who was the architect for the first portion. The contractors were Messrs. G. E. Wallis & Sons.

**MEMORIAL CHURCH AT ABERDULAI.**—On the 6th inst. the foundation-stone was laid of the St. Anne's Memorial Church at Aberdulai (Neath), by Miss Mary Griffiths, of Resolven. The design has been prepared by Mr. E. H. Lingen-Barker, of Hereford, and the contract has been entrusted to Mr. Walter Dowland, of Aberystwyth. The Gothic style of architecture has been chosen. Sitting accommodation will be afforded for 300 persons.

**METROPOLITAN POLICE STATIONS.**—For the improvement and enlargement of some of the principal stations within the metropolitan district, certain lands and hereditaments, as follows, are about to be acquired.—St. James's, Westminster: 11,350 ft. superficial, with the police-station and Court in Great Marlborough-street, and No. 20 in that thoroughfare. Hackney: 5,772 ft. superficial, with No. 422, Mare-street, and the police-station next west of St. John's churchyard. St. Pancras: 3,355 ft. superficial, with Nos. 63, 65, and 67, Judd-street, eastwards of Hunt's, and known as the "Horse Cross Estate," 11,010 ft. superficial will be taken for purposes of a new police-station on the western side of Kentish-town-road, between the Midland Railway line and Holme's-road (formerly Mansfield-place).

**THE HORNE CROSS ESTATE, GREENHITH.**—We understand that the whole of the property, consisting of about fifty acres, and known as the Horne Cross Estate, Greenhith, has been disposed of by Mr. Frederic W. Fryer, of Walbrook, for the sum of 20,000l., and that Mr. Fryer has been retained by the purchasers to lay out the same and to act as architect and surveyor for the extensive building operations which are to be immediately commenced.



LIBRARY OF THE LATE J. G. CRACE.—The catalogue of the library of the late Mr. J. G. Crace, which is to be sold early next month by Messrs. Sotheby, includes a considerable number of rare and curious books on subjects connected with architecture, decoration, and building.



## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENT.

## COMPETITIONS.

Nature of Work.	By whom Advertised.	Premium.	Designs to be delivered.
*Designs for Furnishing New Council Chamber.	York Corporation.	200	Dec. 1.
*Public Offices, &c.	Haydon and Rolyt. B.	£50, 200, and 250.	Jan. 1.

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
New Bridge, near Hollybush.	Bedwellty Union.	W. L. Griffiths.	Nov. 18.
250 Lamp Pylons.	Cardiff Corporation.	Official.	do.
*New Goods Sheds at God Ford and Birmington.	L. & N. W. R. Co.	do.	Nov. 19.
Sewerage and Waterworks.	Cardiff Corporation.	Official.	Nov. 20.
Supply of Soft Timber.	Cardiff Corporation.	J. A. B. Williams.	do.
Cast Iron Sinks, Pipes, &c.	Cardiff Corporation.	do.	do.
Leads for Wires.	Cardiff Corporation.	do.	do.
*Making-up Roads.	Ealing Local Board.	C. Jones.	Nov. 21.
*Batteries, Drift, sand, Magazine, &c.	The Admiralty.	Official.	do.
New School, Playgrounds, Master's House, &c.	Cardiff Corporation.	do.	do.
Repairs, Longwood Station, Eglw. N. B.	Cardiff Corporation.	do.	do.
Repairs, General Painting, &c. Workhouse.	Cardiff Corporation.	do.	do.
Iron, Chain, &c. Street.	Cardiff Corporation.	do.	do.
*Road and Drainage Works.	Cardiff Corporation.	do.	do.
Road Works, Drainage, &c.	Cardiff Corporation.	do.	do.
Pipe Sewers, &c.	Cardiff Corporation.	do.	do.
Readmanning and Pitching, Goddalling.	Cardiff Corporation.	do.	do.
*Making-up and Paving, with Blue Bricks.	Cardiff Corporation.	do.	do.
*Ironwork for Warehouse.	Cardiff Corporation.	do.	do.
Re-hanging Pair of Bell, &c. St. Ives.	Cardiff Corporation.	do.	do.
Church near Lakenham.	Cardiff Corporation.	do.	do.
Work at Bath and Washhouses.	Cardiff Corporation.	do.	do.
Travelling Crane.	Cardiff Corporation.	do.	do.
*Stoking Well, &c.	Cardiff Corporation.	do.	do.

## CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Sewerage, Flagging, &c.	Lutherland (Liverpool) Local Board.	W. B. Garton.	Nov. 20.
Asphalting Footpaths, &c.	Fulham Vestry.	W. Sykes.	do.
Resurfacing and Paving Works.	London County Council.	T. W. Aldrich.	do.
Roads and Sewers, Dartford.	London County Council.	Official.	do.
Sewerage, &c.	London County Council.	Official.	do.
*Sundry Painting at Myatt's Fields, Camberwell.	London County Council.	Official.	do.
Wrought-iron Tubing, Holes, Drains, &c.	London County Council.	Official.	do.
Board School Extension, Carstares.	London County Council.	Official.	do.
House, &c.	London County Council.	Official.	do.
*Supply of Materials and Executing Works.	London County Council.	Official.	do.
*Brick Sewers, &c. St. Pancras.	London County Council.	Official.	do.
New Waterworks, Llandafon.	London County Council.	Official.	do.
Stoneware Pipe Sewers, &c.	London County Council.	Official.	do.
New Chapel, Workhouse, Cundle.	London County Council.	Official.	do.
*New Citadel at Sunderland.	London County Council.	Official.	do.
*Erection of Pureport Warehouse, Liverpool.	London County Council.	Official.	do.
Additions to House at Colchester, near Darlington.	London County Council.	Official.	do.
Alterations to House at Colchester, near Darlington.	London County Council.	Official.	do.
Alterations and Additions to St. George's House, Leeds.	London County Council.	Official.	do.
*Samples of Sanitary Filings.	London County Council.	Official.	do.
Electric Filings, &c.	London County Council.	Official.	do.
Sinking Two Pits.	London County Council.	Official.	do.
Alterations to the "Green" at Newcastle.	London County Council.	Official.	do.

## PUBLIC APPOINTMENT.

Nature of Appointment.	By whom Advertised.	Salary.	Applicants to be in.
*Sanitary Inspector.	County of Perth.	300l.	Nov. 2.

Those marked with an Asterisk (\*) are advertised in this Number. Competition, p. iv. Contractors, pp. iv., vi., and vii. Public Appointments, p. xvii.

**REMOVAL.**—Messrs. Davey, Paxman, & Co., of Colchester, have removed their London offices from 189, Queen Victoria-street, to larger and more convenient premises, situate 78, Queen Victoria-street.

**TILES.**—We have received from Messrs. Malkin & Edge, of Burslem, a well-printed sheet in chromolithograph showing a number of their recent tile patterns to a scale of 2 in. to a foot for hearth and wall tiles, and 3 in. for floor tiles.

**ELECTRIC LIGHT IN SURREY.**—The installation of the electric light has been completed at Woking, Surrey, and on the 10th inst. the light was supplied for the first time to private consumers. The price charged is 8d. per unit, which is equivalent to 4s. 2d. per 1,000 ft. of gas. Hitherto Woking has had no illuminant other than oil and candles, and there is no system of public lighting whatever. The adoption of electricity in several Surrey towns has long been talked of, Goddalling had the electric light some years ago, but it failed on account of the water-power utilised. The inhabitants have now strongly taken up the idea of restarting its production, and Guildford and Dorking have each discussed the advisability of adopting the light. At Weybridge, a residential locality, the electric light has been manufactured successfully for some months.—*Morning Post.*

**ST. MARY MAGDALEN, OLD FISH-STREET.**—Having been left desolate since the fire of December 2, 1886, which destroyed most of its interior, the Church of St. Mary Magdalen (Old Fish-street) in Knight-riders-street, is about to be demolished. Notice has just been given that the tablets and monuments, together with the remains of those persons buried there, will shortly be removed. Option is given to all interested parties of claiming these memorials, and of providing for re-interment of any remains. Failing this, after December 1 next the latter will be taken to the City of London cemetery at Little Hford, whilst the memorial stones will be set up in St. Martin's, Ludgate. The latter is now the parish church for the united parishes of St. Mary Magdalen, St. Gregory-by-St. Paul's, and St. Martin, Ludgate.

**ST. GABRIEL FENCHURCH AND ANCIENT LIGHTS.**—At a sitting of the Consistory Court, in St. Paul's, on the 5th inst., Dr. Tristram, Q.C., Chancellor of the Diocese of London, granted a faculty in respect of St. Gabriel Fenchurch churchyard. The rector and churchwardens asked for authority to license the City of London Real Property Company, occupants of Nos. 35 and 36, Lime-street, to open seven ancient and certain other new lights in their wall, which forms the western wall of the now disused burial-ground. Against this wall some tombstones are placed. All parties agreed to this being done, and to the concurrent removal of the tombstones to within the churchyard, upon payment by the company of costs in the matter, and of a sum of 150l. to Queen Anne's Bounty for the benefit of the rector for the time being. St. Gabriel's Church in Langbourne Ward, formerly stood in the thoroughfare of Fenchurch-street. Destroyed by the Great Fire, it was not rebuilt. The parish was united with that of St. Margaret Pattens, in Billingsgate Ward, under section 55 of the Act 22 Charles II., cap. 11, and the churchyard closed by Order in Council in 1553.

\* For an account of the church (with view) and of the site see the Builder of December 11, 1886.

LEGAL.  
BUILDING BEYOND THE LINE OF FRONTAGE.

THE adjourned hearing of the summonses against the City and South London Railway Company for building stations at the corner of New-street, Kensington-park-road, and Harleyford-road, Kensington-oval, beyond the line of frontage, and without the consent in writing of the London County Council, were heard at Lambeth Police-court, on Monday. Mr. J. C. Glen supported the summonses on behalf of the London County Council, and Mr. William Graham represented the company. At the original hearing, it was contended that the company, having built the stations in advance of the general line of frontage, as defined by the Superintending Architect, so covering what had been the forecourts of the houses that formerly stood on the sites, a breach of the law had been committed. For the defence it was contended that the company were empowered by their private Act to do what they had done, and that its provisions nullified the restrictions in the Metropolitan Local Management Acts. At the hearing on Monday, Mr. Greathead, the engineer of the line, Sir Benjamin Baker, one of the consulting engineers to the company, and Mr. Thomas S. Jeulein, general manager of the line, were examined, and gave evidence to the effect that the stations had been built in the most convenient manner for the public. Mr. Glen said the special Act of the company authorised them to do such things as were necessary for the undertaking, and the onus was on them to show that that could not be done without infringing the general line of frontage. The evidence showed that it could have been done without infringing the line, and, therefore, the general Act applied. Mr. Graham said there were no public rights or private rights over the gardens except those the company acquired by their Act. He submitted that the company were entitled to do all that was reasonably convenient, and that the directors and engineers of the company, so long as they acted as reasonable beings, were the people to judge what was reasonably convenient, and not the County Council. Mr. Hopkins reserved his decision.

## INFRINGEMENT OF BUILDING BY-LAWS.

At Barnsley on the 5th inst., Mr. William Ritchie, surgeon, of Hoyland, was summoned for two breaches of the building regulations of the Wortley Union Sanitary Authority, by allowing several houses which he had erected at Tankersley, to be inhabited before receiving a certificate of their fitness for habitation from the inspector to the authority. Mr. Beaumont, inspector, proved that the houses had been inhabited and he had not had any application for certificate of fitness, nor of the fact that the houses were sufficiently supplied with water. A fine of 10s. on each charge was imposed.

## MEETINGS.

**MONDAY, NOVEMBER 17.**  
Royal Institute of British Architects.—Business meeting for Members only. 8 p.m.  
Royal Academy of Arts.—Professor A. H. Church, M.A., F.R.S., on "Selected and Restricted Palettes." 4 p.m.

**TUESDAY, NOVEMBER 18.**  
Institution of Civil Engineers.—(1.) Further discussion on Mr. John McLaren's paper on "Construction of Roads." (2) time permitting Professor John Milne,

F.R.S., and Mr. John McDonald on "The Vibrations of Locomotives." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).

Mr. A. Wynter Blyth, on "Diseases of Animals in relation to Man." 8 p.m.

Leeds and Yorkshire Architectural Association.—Address by the President, Mr. W. H. Thorp, F.R.I.B.A. 7.30 p.m.

Leeds and Yorkshire Architectural Association.—Mr. F. Barker, on "A Three Months' Tour in Belgium and Northern France." 7.30 p.m.

Glasgow Architectural Association.—Mr. T. Robertson on "Art in our Homes." 8 p.m.

**WEDNESDAY, NOVEMBER 19.**

Society of Arts.—Opening address of the Session by the Attorney-General, Sir Richard Webster, M.P. 8 p.m.

Institution of Electrical Engineers.—President's Conversations. From 9 to 13 p.m.

London Society for the Extension of University Teaching (Chelsea Centre).—Mr. Walter Leaf on "Homer and the Shield of Achilles." 5.15 p.m.

British Archaeological Association.—Mr. A. Langdon on "Ancient Copied Stones in Cornwall." 8 p.m.

Royal Meteorological Society.—Address by the President, Mr. Baldwin Latham, on "The Relation of Ground Water to Disease." 7 p.m.

**THURSDAY, NOVEMBER 20.**

Royal Academy of Arts.—Professor A. H. Church, M.A., F.R.S., on "Chemistry of Painting: Methods." 4 p.m.

**FRIDAY, NOVEMBER 21.**

Sanitary Institute (Lectures for Sanitary Officers).

Mr. A. Wynter Blyth on "Sanitary Law (English, Scotch, and Irish); General Enactments, Public Health Act, 1875; By-laws," &c.

Engineering Society.—Professor Sir William Thompson, B.A., on "Electro-Magnetic Mechanism." 8 p.m.

## RECENT PATENTS:

## ABSTRACTS OF SPECIFICATIONS.

18,951.—KILNS: *W. J. Hague*.—In order to obtain the greatest efficiency in heating kilns by common gas, an air-chamber or passage encircling or partly encircling the base of the gas producer, with an inlet for air provided. This communicates with other passages formed in making or disposing the goods in the kiln and allows the heat to be regulated and preserved.

19,302.—IMPROVED MORTISING-CHISEL: *R. W. Lath*.—The extremities of all three walls of the chisel extend as to lie in the same horizontal plane, assuming the chisel to be vertically placed, but only the middle side or blade is brought to a cutting edge, the other two very thin, being ground off flat. This construction has an advantage in use, the wood being cut at the same time taken out of the mortice.

5,974.—IMPROVEMENTS IN GRATES: *F. M. Goodall*. This invention consists of a removable support with legs forming part of the grate bars, and a frame work for attachment to a stove. The grate itself is two semi-circular sections with hinges, allowing them to be raised and lowered, and the grate shaken. The grate bars may easily be removed altogether to clean or to lay aside.

9,883.—RATTLING WINDOWS: *G. Kendall*.—To prevent rattling from rattling a turn button of a special shape attached to a vertical strip, and pressing against a wall.

11,443.—GYPSUM BRICKS: *A. Buscher*.—In order to overcome the difficulties of making light bricks, gypsum bricks are made by stirring with water, mixed with specified ingredients and then dried. Advantages claimed for these gypsum bricks are lightness and the direct use of the bricks without mortar, thus excluding vermin.

12,466.—SASH BALANCES: *G. C. Gardner*.—Intending aashboard, a wire or thin metallic band, is employed by this inventor for the purpose indicated.

8,400.—BRICKS AND BRICKS OR TILES: *A. J. J. Ansell*.—Enamel bricks, plates or tiles, suitable











# The Builder.

Vol. LIX. No. 2484.

SATURDAY, NOV. 22, 1890

## ILLUSTRATIONS.

Ancient Bridge Chapels at Wakefield and Rotherham	Double-Page Photo-Litho.
Examples of Brasses, from Rubbings by Mr. A. Oliver, A.R.S.A.—Sir William de Tending, Stoke-by-Nayland; Simon de Wenslagh, Wensley; and Sir Nicholas Dagworth, Bickling	Double-Page Photo-Litho.
Second Preliminary Design for Harringay Board School. By Messrs. Mitchell & Butler	Single-Page Ink-Photo.
Memorial Chapel, Trafalgar-road, Greenwich.—Mr. A. H. Skipworth, Architect	Single-Page Ink-Photo.
Barnwell Castle, Northants, as Enlarged.—Messrs. Gutch & Saunders, Architects	Single-Page Typo-Gravure.
Manor House, Beigstock, as Enlarged.—Messrs. Gutch & Saunders, Architects	Single-Page Typo-Gravure.

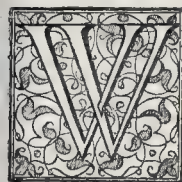
## Blocks in Text.

Sketch-plan of Remains found near the Tower of the Winds, Athens	Page 403	Sketch of South Front of Rotherham-bridge Chapel, and Sketch-plan	Page 406
Apparatus for Testing Cement	406	Ground Plan of Barnwell Castle	407
Hot water Supply: Diagrams illustrating Paper in the "Student's Column"	Pages 408-410		

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### Further Notes on the Turin Exhibition.



WE have more than once referred to the future promise of Italian architecture as indicated in the work of those who are the students of to-day, the architects of tomorrow. To anyone who would understand the position of a people in regard to any branch of art, the work of its students, containing as it must do the best evidence of what may lie beyond the present, cannot but prove of the highest interest. There is sufficient in the Turin Exhibition to justify hopes that in the next decade, granted suitable opportunity for expression, modern Italian architecture may produce good and earnest work that will mark the end of the nineteenth century as a time of high achievement in the history of the art.

The fair promise for the future is, however, we can but regret, not universally indicated by all of the architectural schools represented in the exhibition. In the *Scuola di Architettura* that forms one faculty of the *Regia Scuola di Applicazione per gli Ingegneri in Torino* there is, unfortunately, too much evidence of an academic following of precedent, too little originality of conception, and too frequent exhibition of that lack of a fine sense of proportion in design which, as we have already remarked, is so frequently found in modern Italian architecture. From this school are exhibited designs for colleges, theatres, markets, libraries, and museums, illustrated by plans, elevations, sections, and details fully worked out, coloured and shaded, which show but too clearly a constrained and stunted art development, that exhibits the faults we have indicated.

When, however, we come to examine the work submitted from the *Scuola Speciale di Architettura* of the *Regia Accademia di Belle Arti di Milano*, we recognise that in Professor Boito has been found one of those born teachers who are able to draw out the best powers of the students who are so fortunate as to profit by the educational ability of their masters. One cannot doubt that the impress

which the pupils of this school will leave on the sands of time will be one to be regarded with admiration and satisfaction in the chronicles of the future of Italian architecture. The school that has produced such men as Moretti, Sommaruga, and, in ecclesiastical art, Brentano, whose loss is one ever to be regretted, will bear like good fruit in the future.

Fortunately, too, we gather from the drawings exhibited in the Exhibition that, in modern Italy, a young man of ability and talent stands an excellent chance of being fairly recognised by the almost universal selection, in the great competitions here illustrated, of designs that can most readily be accepted as the best of those submitted. Possibly the method of deciding on the merits of designs sent in competition, which appears to obtain in Italy as elsewhere on the Continent, by a qualified jury rather than by a single assessor, has much to do with the satisfactory nature of the conclusions to which competitions are usually brought. The decision of a single assessor has not in our own country, as we need hardly remind our readers, been universally that which meets with the general approval either of the profession or of the press. With the most sincere intention and the most careful consideration, a single assessor, however unwittingly, may be, and we fear often is, unduly biassed, either by a predilection, possibly for some particular style, possibly for some particular principle of planning; or by what is equally fatal to a right judgment, by the desire to avoid undue prejudice, leading to an unsound conclusion, which might probably be avoided by the combination of varied views, such as is the necessary concomitant of the differing shades of opinion to be found in the minds of a properly-qualified jury. "In the multitude of counsellors there is wisdom" is as true at the close of the nineteenth century as when the statement was first formulated, and hence we cannot but feel that in the continental jury system, rather than in our insular method of a single assessor, is to be found the panacea for some, at least, of the soreness too often engendered by our architectural competitions.

To return, however, to the Milan School of Architecture; we find exhibited designs for the various ideal buildings that universally figure in students' work, designs in varied

styles—Pompeian, Renaissance, Romanesque—but one and all showing power of design, originality of conception combined with knowledge of the past, a right sense of proportion, and excellence of draughtsmanship, especially in the use of the brush, that is exceedingly refreshing. There is exemplified also a feeling for colour and a facility in its employment that is of very happy augury. If there is a possible fault in the work of the Milanese students, it is a slight tendency to a *bravura* method of expression that needs careful watching and repression, but this even is a pleasant antithesis to dull and deadly coldness and formality,—qualities that, in the Milan school, are conspicuously absent.

Highly interesting is a group of extemporaneous sketch designs in pencil for set subjects,—a method of architectural education too much neglected in the training of English students. The ability to immediately grapple with an architectural problem, and quickly to grasp its solution, is indeed the power that is most tested in the examination in design held by the Royal Institute of British Architects as an integral portion of the qualifying examination for the Associateship; but as a means of education the method herein indicated is absent from the work of the Architectural Association, as from that of other schools. The value of such a method in the artistic training of an architect is sufficiently obvious, and possibly some of the pre-eminence of the Milan school is due to the adoption of this method.

The students of the *Regia Istituto di Belle Arti di Venezia* exhibit drawings showing an ability in design and expression scarcely inferior to that of the Milan students, and the qualities we have mentioned as characterising the work of the latter may be found in the Venetian work also.

As studies of old work there are shown, in drawings by students of the *Istituto di Belle Arti di Firenze*, a large-scale detail of the cornice of the Strozzi, in section and isometrical perspective, a full-size drawing of one of the Erechtheion capitals, and a conjectural restoration of the Temple of Venus and Rome.

The work of the other architectural school exhibited, that of the *Regia Accademia Albertina di Torino*, consists too largely of drawings of existing buildings, apparently



copied from books. Such a means of instruction may teach drawing, but not design; hence the designs submitted show too much of mere copying, and are, in the worst sense of the word, academic.

From the work of students in the schools we may pass on to that which consists of study in the open, sketches and measured drawings from existing buildings. As we have remarked in a former article, these consist mainly of studies by church designers and of official records of historical monuments. Foremost among the ecclesiastical studies are the sketches by Brentano, who, we need hardly mention, was the successful competitor for the new façade to the Cathedral of Milan. The interest attaching to these studies is still further heightened by the melancholy fact of his decease ere the realisation of his conceptions had been begun. The examples of Brentano's work exhibited consist of photographs and lithographs of his various designs for the Milan façade, and a collection of sketches chiefly from Regensburg, Nuremberg, Venice, and Siena. These are, for the most part, perspective sketches in pencil, some shaded, some in outline, together with studies of detail.

An interesting collection of sketches is that by Odo Cavagnari, made during a tour in Genoa and the Riviera in September, 1889, and therefore probably a fair specimen of the Italian student's sketch-book at the present time. The sketches are mainly of ecclesiastical work, fairly catholic in style, but wholly drawn in ruled-up elevations, usually to small scale. No dimensions are figured, and no scale is indicated, while sections and details of mouldings, &c., are few. Thus, compared with that of our present-day English students, the Italian method would seem to lack thoroughness and careful analysis.

By far the greater part of the illustrations of old work in the Exhibition is that gathered by the Department of Antiquities and Fine Arts of the Ministry of Public Instruction. This is divided into the representative work of the various provinces of Italy. Thus from Emilia we have measured drawings and designs for the restoration of the Mercanzia and the Palazzo delle Biade, in Bologna, also photographs and designs for the restoration of the Antico Palazzo Accursio, Bologna. From Tuscany there are shown measured drawings in ink line of the singing galleries of Donatello and Luca della Robbia in the cathedral church of S. Maria del Fiore, Florence, also some good photographs both of general views and of details together with tracings of plans of the ducal palace at Urbino. "Marche ed Umbria" are represented by Professor Calderini's designs for the restoration of the cathedral at Perugia; Rome by a plan showing the antique monumental remains to be preserved as ancient monuments; tracings showing the restoration of the atrium to the Church of St. Paul; and measured drawings of the Croce di Lucca and Sapienza to the large scale of  $\frac{1}{16}$ , with details half full-size.

The district of Naples is particularly well represented by a large and fine collection of drawings to various scales, several full size, of the coloured decoration found in Pompeii, together with carefully-drawn plans of the town as unearthed by exploration. The effect of the coloured decoration of Pompeii is still further illustrated by a full-size model of the Frigidario del Sarno prepared under the superintendence of Professor E. Taverna.

From Sicily are sent photographs of the Church of S. Francesco, Palermo, which, with its pointed arches ornamented with Norman zigzag and billet, cannot fail to prove interesting to an Englishman.

In connexion with the restoration of the Cathedral of Orvieto, there are exhibited two sumptuously-bound albums, one containing a large number of photographs, including some of the unexecuted designs of Ippolito Scalza (1532-1617 A.D.), of Michelangelo, and of other authors whose names are not recorded; the second containing detail drawings of the existing coloured decoration, chiefly to the ribs of ceilings.

An exceedingly nice collection of tenderly-executed pencil-sketches illustrates the highly-interesting work of South-Eastern France, Aigues-Mortes, Carcassonne, and other old-world towns.

Although exhibited probably as an advertisement of skilful handicraft, the full-sized model, or rather reproduction, of part of the façade of the so-called Casa del Conte Verde, at Rivoli, fitly has a place among the records of the past of Italian architecture. The reproduction is executed in red brick and red terra-cotta, and comprises two of the four arches of the ground story, with two windows over, and gives an excellent idea of the treatment of these materials in North Italy during the sixteenth century. Under the windows is an elaborate frieze, representing the Count and Countess (possibly) looking out of flamboyant windows. The work is exhibited by Villanova, of Turin, and the original casts are also shown.

The work of Piedmont and Liguria is extensively represented by photographs and casts of the Roman arch of Augustus at Susa; measured drawings and sketches of Medieval work, especially of coloured decoration; details of mosaic work, shown by coloured "squeezes,"—a method that is worth remembering as a facile expedient for obtaining an absolutely reliable record of the exact treatment; and some highly interesting specimens of wood-panelling, chiefly of the fifteenth century, and showing various applications of linen panel work.

From Lombardy there come lithographs of careful measured drawings of the Ducal Palace at Venice, and photographs of St. Mark.

In addition to the drawings hung on the walls, there are in this department of historical monuments floor cases containing some good photographs, chiefly from Bologna, Venice, and Aosta, and various models, including one of considerable interest showing the shoring and scaffolding to the Ducal Palace at Venice, a model of part of the city of Pompeii in its actual state, and a restoration of a Pompeian house, also models in cork of the three Doric temples of Paestum, and the amphitheatre of Pompeii.

Models as a means of architectural delineation are fairly well represented in the Exhibition, though it must be admitted that but few are of quite modern work. Models are costly, it is true, still their value is evidently appreciated, especially for the better comprehension which they afford to the non-professional observer. To the student also casts of old work such as are here exhibited are of high value; thus we have a fine example of the work of Pellegrini in the choir-stalls of the church of S. Celso, Milan, details of Bramante's work in an internal frieze from the Ospedale Maggiore, a reproduction of the marble altar in the cathedral at Como by Tommaso Rodari di Maroggia of the date 1492, and close by a cast of a doorway from St. Lorenzo, Lugano, also the work of Rodari di Maroggia, but dated 1517, and showing the advance made in the detail of the Italian Renaissance during that quarter of a century. Further on we find a cast of Madonna and angels from Ascona, on the Lago Maggiore, the work of Fra Sordino, date 1620; and a large replica of the window dressings, in Barocco style, date 1650, the work of Antonio Camussi da Montagnola, from the church of St. Rocco, Lugano. Thus, in a collection of some half-dozen well-chosen examples, we have an epitome of the course of Italian Renaissance detail, highly instructive both to the student and to the laic.

These casts are but one branch of the work of the *stuccatore*, a handicraft which, as we have before remarked, is carried to a high state of excellence in Italy. Other examples of this craft are not wanting, executed either in stucco, plaster of Paris, or Parian cement, or in various imitations of natural stone, some resembling granite or marbles of various tints, some different kinds of freestone.

Skil in imitation is also found in the reproduction of old tiles by Cantagalli, of Florence, who has laid under contribution the

work in the Alhambra, the church of S. Maria Novella, Florence, the majolica ware of Luca della Robbia, the Sala Borgia in the Vatican.

There are also excellent examples of imitation mosaic by the Società Anonima Facsimili di Mosaico di Venezia, consisting of reproductions of the mosaic work of St. Mark's, Venice. This Company also exhibits a reproduction of a Madonna by Luca della Robbia.

Akin to these productions of fictile art are the works in terra-cotta, numerous specimens of which are shown. The terra-cotta is for the most part in mildly-burnt clay, and usually red in colour, though there are also pieces of glazed work, coloured usually green, blue, or white. Amongst the terra-cotta we come across examples, chiefly in model, of fireproof floor construction, similar to the Doulton-Peto method of our own experience.

There are several collections of samples of building stone, marbles, and granites, in which latter Italy is rich. An excellent description of light grey granite, for example, is the *granito bianco d'Alto*, from the Lago d'Orte, which, indeed, has been somewhat largely used in Turin itself.

Metal-work is sufficiently represented in the Exhibition to give a good idea of the ability of the modern Italian craftsman in this direction. Wrought-iron work is exemplified by candelabra of various forms and designs, balconies, door-handles, and so forth. There appears evidence of too great a desire to economise labour and so promote cheapness, rivets taking the place of welded joints, and a suspicion of stamping that of genuine hammering up. In general effect the Italian work looks somewhat coarser than our best English work, and there is generally a pleasing absence of file work and smoothness of finish. In design, though some examples are a trifle bizarre, there is ample evidence of versatility and originality, especially in those examples which are based on motifs of Late Renaissance character; the spirit of Barocco and Rococo design being one which clearly suits the modern Italian in this as in other classes of decorative accessories.

Some of the best examples of metal-work in the Exhibition are seen among the bronzes, in designs for lamps, knockers, and other bijouterie. Both in conception and in execution the bronze-work leaves little to be desired, granting that exception be not taken to the somewhat fantastic character of Late Renaissance feeling.

In zinc and lead there are shown specimens of moulded, hammered, and cast work for eaves, gutters, and other external parts of roofs. Some few examples of sanitary works, baths, and other plumbing details, tin-lined pipes, and an application of the water-spray method for ventilation may be seen. In this department, however, it is scarcely necessary to say that Englishmen have little to learn from their Italian confrères.

Woodwork is represented by some skilfully-wrought parquetry and by a few examples of carved wood furniture, which show pre-eminently skilful in handicraft as well as fair design.

There appear to be in Italy some architects who make a speciality of internal design,—a principle which obtains elsewhere on the Continent. Of these, for example, Signor Giovanni Riggi, of Rome, sends photographs of executed works which remind us of the work of the late Talbot Perry, chiefly designs for staircases and halls, such as those in the Villa Malta for Conte Leone Bobinsky, the Villa Massimo for Prince Colonna di Sonnino, and the palace of the Duke Grazioli Lante della Rovere. The same artist also sends photographs of the ball-room and staircase of the English Embassy at Rome. In the same category are the photographs of the library of Baron Leopold Rothschild in his London residence, the design of Professor Rinaldo Barbetti, of Florence.

Elaborate designs for internal coloured decoration appear in the drawings of many architects, showing that this is a branch of artistic work that receives considerable attention in modern Italy, while specimens of the



work of the actual executants of painted and their decoration, modelling, and embroidery re exhibited. The painting, both of ornament and of pictorial decoration, shows considerable variety of treatment, with, perhaps, tendency to exaggeration in the composition of colour as well as in the drawing of line. Thus in decorative work, as in so many other forms of art expression, there is found a striving, among, apparently, the younger generation of Italian artists, for strong and powerful effects, for dash and fire rather than refinement and delicacy, for thunder and lightning rather than calm and unruffled placidity. In architectural design, in draughtsmanship, in colour, and in form there is clearly evident a seething restlessness, an eager intensity to escape from anything like academical restraint, to burst the bonds of classical regularity, and to give free play to fancy without limitation, save that force and vigour must at any cost be paramount in every form of art expression. That cost is the exchange of refinement for vulgarity, of restraint for licence, of breadth and repose for splutter and splash. Not that vulgarity and licence are as yet characteristic of the work of young artistic Italy, but there is a danger ahead to the architectural Phœbus if his fiery steeds he has yoked to his chariot be not held with a firm hand on the reins.

Modern Italian architecture, together with its allied arts and crafts, thus clearly divides to two schools: on the one hand, the cold, formal, lifeless work of the older régime, academical in its insipidity, but not academical in correctness of taste or of proportion; on the other hand, the exuberant, boisterous, intensely living work of the younger men, full of fire and vigour, and without doubt due to a natural revulsion of feeling against the tame and tasteless work of the immediate past. This state of things we cannot but regard as one of happy augury for the future of Italian architecture. The life and vigour will survive, the exuberance will be toned down. It is so already in the work of the best men, the most thorough artists; but just the style of Michelangelo produced that of the Caracci, so we may expect that the work of Moretti and of Sommaruga, of Brentano and of Muggia, will produce imitators who will mistake vulgarity for vigour and licence for liberty.

Literary material for architectural education is a product with which Italy, in common with other continental nations, is well supplied, and there are exhibited some excellent collections of photographs of Manno, of Turin; Popp, of Bologna, and others, especially illustrating, for the most part, the work of North Italy, both Medieval and Renaissance: while such well-known architectural publishers as Ongania, of Venice; Ceppi, of Milan; Clausen, of Berlin; Ernst and Korn, of Berlin; Lehmann and Wenzel, of Vienna, and others, are represented by monographs and other special technical works. There are also some interesting specimens of old architectural books, a rare copy of Vitruvius, date 1500; a volume of illustrations of buildings in Rome newly-erected during the Pontificate of Alexander VII.; the palaces of Genoa, illustrated by Rubens, published at Antwerp, 1622; a Dutch account of the architecture of Piedmont and Savoy, published at Graevenhaage, 1725, and many others.

With a praiseworthy intention of making the Exhibition instructive, an opportunity of comparing the work of their own country with that of foreigners has been afforded to the Italian architects, as well as their employers, by the admirable collection of the work of many parts of Europe, lent by various municipal authorities. For the purpose of complete comparison of European architecture as a whole, the value of the collection is, however, diminished by the absence of French work. Possibly political considerations have militated against the catholicity of art.

London is represented by drawings and models from the City Architect's office, showing the designs for the Tower Bridge, the

Guildhall Library, Council Chamber, and Courts; Leadenhall Market, the Foreign Cattle Market, Deptford; Billingsgate Market, the Central Markets at Smithfield and Farringdon, the Caledonian-road Cattle Market, the Artisans' and Labourers' Dwellings, Petticoat-square; the Cemetery at Ilford, Holborn Viaduct, Underground Urinals, the Destructor at Lettis' Wharf, and plans and details of the City sewerage.

Our own share in the Exhibition is, however, eclipsed by the extensive contribution of Berlin and Vienna. From Berlin have been sent full illustrations, plans, and details of the sewerage system of the city, and of its water-supply; historical data of the growth and development of the city, together with particulars of municipal improvements; illustrations of scholastic buildings, hospitals, markets, bridges, municipal and other public offices.

Vienna is represented by plans and bird's-eye views, showing the growth of the city, and especially the formation of the Ring, and the regulation of the Danube river; also by drawings of the Rath-haus and other public buildings and municipal works. There are also graphic delineations of the amount of building carried on in various years from 1848 to 1889, of the tables of mortality, and of the movement of subsoil water.

From Warsaw and Cracow come extensive collections of photographs, which will probably be a revelation to many Italian architects, as they certainly would to the majority of their English colleagues. Prague, which also is represented here, has recently received some attention at the hands of English travelling students—and justly so—for the picturesque of its Medieval architecture. Cracow, from the exhibition to be seen at Turin, would prove of equal interest to those at least for whom Prague has charms.

Other cities and towns of Europe are represented by photographs, drawings, and pamphlets illustrating usually both the old and modern work of the locality, and plans of the city. These are Worms, Eger, Rostock, Passau, Stuttgart, Nuremberg, Eisenach, Erlangen, Augsburg, Meiningen, Furth, Mayence, Lubeck, Altenburg, Hamburg, Leipzig, Weissenfels, Wesel, Wiesbaden, Stralsund, Magdeburg, Stettin, Iglau, Kaiserslautern, Strasburg, Halle, Erfurt, Constantinople, and Barcelona.

Even such far-off spots as Boma on the Congo, Colombo, and Hayti are represented by photographs of their local buildings.

Besides these foreign contributions, the various municipalities of Italy send highly-interesting and important evidence of their corporate works and civic development.

Thus, the Corporation of Turin exhibits large plans of the town at various dates, showing its gradual growth from the Colonia Julia Augusta Taurinorum to the Torino of 1890, illustrations of the public cemeteries and school-buildings, besides models and designs for bridges over the Po. In designs for bridges we find generally in Italian work some compensation for the unhappy supremacy of the engineer over the architect, on which we have commented in a former article. The design of the bridges certainly benefits by the architectural training of the engineer, and this whether the material be stone or iron. The bridges are, in fact, designed, as they should be, by architects who are scientifically trained, not by skillful handlers of formulae, whose work is afterwards dressed up by an unsympathetic draughtsman, too often imperfectly endued with the power of artistic design, and lacking in fertility of conception. Comparison of the design of our Tower Bridge, for example, with that of some of the new bridges over the Po or the Tiber does not tend to an overwhelming conceit as to our national ability in the paths of artistic engineering.

From Milan has been sent a most carefully-prepared and elaborate series of studies in water-supply, comprising data of every kind, graphically expressed, so as to convey to the mind the various complicated questions which have to be considered in arranging for such

an important undertaking, particulars of density of population, of manufactories and their requirements, of the sources of supply, with their constantly-varying capabilities, and other important points.

Other municipalities of Italy have sent plans and illustrations of various matters connected with civic administration, the formation of new streets, as at Spezia, Novara, Bologna, Naples, and elsewhere, plans of public school-buildings, drainage, and water-supply, markets and other institutions.

From Rome the only illustration is that of the proposal to make the city a seaport, by the construction of a ship canal from Ostia, a plan of which is exhibited.

Thus the exhibition of the representative works of both foreign and Italian municipalities, although somewhat irregularly arranged, gives a valuable opportunity to the specialist for comparison of various methods of dealing with the great problems of modern civic life, water-supply, drainage, and means of communication.

Before closing our notes on the first exhibition of Italian architecture we should call attention to the very admirable reproduction of a Medieval Piedmontese town and castle which has been erected, after the fashion of Old London, in the public gardens on the banks of the Po, in close proximity to the building in which the architectural exhibition is housed. This, however, is superior to our own example, as, instead of being mere scene-painting of quartering and canvas, lath and plaster, it is a permanent collection of substantially-built erections in brick, stone, and half-timbering, carefully reproduced from good authority, so that the student is able to grasp not only the salient points, but also the treatment of detail, of North Italian Medieval work, with perhaps almost too much ease and too little wandering and exploration. Turin has hitherto been one of the towns of Italy to be missed by English students, but with the opportunity now afforded, all who wish to gain an idea of the Medieval domestic work of North Italy should make a stay at Turin, and seek out the ancient burg, even when they can no longer visit the Exhibition of Architecture.

#### THE RIGHT OF ACCESS OF AIR TO BUILDINGS.



RECENT decision by Baron Pollock in the case of *Bass v. Gregory* raises an interesting and important question as regards the right of access of air to a building. Popularly, the right to light has been often called the right of light and air. But this connexion is very misleading, since the right to light is quite distinct from the right to air, and the coupling of the two would lead a layman to suppose that the two rights are on the same footing. What, then, is the general right to air? That is to say, is there a prescriptive right to a full amount of air as there is of light? If, for example, the light of a window has been enjoyed for the legal term of years, no one can legally lessen that amount. But the same rule does not apply to air. "A right by way of easement to the access of air over the general unlimited surface of a neighbour's land cannot be acquired by mere enjoyment." These are the words of Lord Justice Cotton, and they state clearly and briefly what may be called the general law as to the right to air. But in the same case, that of *Bryant v. Lefevre*, the same judge remarks, "whether, if the uninterrupted flow of air through a definite aperture or channel over a neighbour's property has been enjoyed as of right for a sufficient period, a right by way of easement could be acquired, it is unnecessary now to say." In the case decided by Baron Pollock, the plaintiff's cellar in a rock was ventilated by a shaft cut through the rock into a well belonging to the defendant. This means of ventilation was stopped by the defendant closing the mouth of the well: hence arose the action. Care must



be taken not to confuse a claim to access of air through a definite channel with one to air in order to keep a place in a wholesome condition. In the well-known case of Dent v. The Auction Mart Co., decided in 1866, this passage occurs in the judgment:—"The Court has interfered to prevent the total obstruction of all circulation of air; and the introduction of three water-closets into a confined space of this description is, I think, an interference which the Court will recognise on the ground of nuisance. This is, perhaps, the proper ground on which to place the interference of the Court; although in decrees the words 'light and air' are often inserted together, as if the two things went *pari passu*." Here is a simple ground upon which a right to air is based,—a right necessary for the wholesome enjoyment of property. But this is a case on which Baron Pollock relied when he decided, —as he did,—that there was a right in the plaintiff to have the channel of air to their cellar kept uninterrupted. If the cellar could have been ventilated by other means, we have doubts whether the decision was a right one, because then the stoppage of the channel did not necessarily make the cellar unwholesome, as it could be ventilated by other means. If, however, there was no other possible means of ventilation, then the blocking-up of the channel would not only make the cellar unwholesome, but unuseable. But the ground of the judgment was that there had been established a right to a flow of air through a definite passage, a ground quite distinct from that of a right to air in order to keep a room wholesome. Whether a right to air through a defined channel exists in English law is certainly not quite clear. In actual practice it is obvious that the most usual way for air to get into an apartment is through a window, hence we see how the elements light and air have become coupled in legal phraseology. If the air of a window is blocked up, a portion of the light is kept away. Thus the vindication of the right to light would also give again the access of the air. For this reason it is obvious that it is difficult to say whether a right to air without a right to light through a definite passage can exist, and we do not think that the recent decision of Baron Pollock helps to elucidate the matter, since, as we have pointed out, the cellar in question might have become useless without the air through the passage. It is possible to think of passages for ventilating purposes which have nothing to do with light, but it is not very easy to think of the stoppage of these without injury to the wholesome character of a building. One of the reasons which have been practically stated to exist against a general right to air over a wide space, is the impossibility of the owner of the servient tenement preventing such right from accruing. The same reason does not exist in regard to air flowing along a defined channel. But we are thus confronted with the question of size. It is clear, therefore, that there is a debateable point of law in regard to ventilation which may some day be settled. But seeing that it does not arise if light or health comes in question, it may be a long time before it arises in a bare, or, as the lawyers say, in a "clean" form.

#### COMPETITIONS.

**BOARD SCHOOLS, PRITTEWELL.**—A special meeting of the Prittlewell School Board was held, on the 3rd instant, to decide upon the plans received in a limited competition for new schools in the Brewery-road, designs having been submitted by Messrs. Charles Bell, London, E. Wright, Walter J. Wood, and J. Taylor, of Southend-on-Sea. The Board unanimously selected the plans of Mr. Walter J. Wood, and instructions were directed to be given to the architect to proceed with the work.

**ASSISTANT SURVEYORSHIP, ISLINGTON.**—Mr. T. Ridyard Roscoe, of Hammersmith, and late of Ramsgate, has been appointed by the Islington Vestry Assistant-Surveyor for the northern portion of their district.

#### NOTES.

**T**HE scaffolding is now almost entirely removed from the restored face of the north transept of Westminster Abbey, and considering that the refacing was a thing which had to be done for practical reasons, and that it cannot be classed as mere sentimental restoration, we think the general result externally is very satisfactory. Mr. Pearson's filling of wall arcading and tracery in the gable differs somewhat from that shown on the frontispiece to Brayley's book; whether that was a correct representation of the design as it existed in Brayley's time is not much to the point; if it is, Mr. Pearson's tracery is an improvement on it in general richness of effect, but the new work at this point would have been all the better for a rather lighter section of tracery bars; it looks somewhat heavy and tends to lessen the scale of the façade. The curious-looking balustrade indicated by Brayley has been removed, and no reasonable person will regret that. The design of the wheel window has been altered, by the shortening of the radiating tracery which formerly extended to the jamb of the window, and the interposition of a circle of quatrefoil lights round the outer margin of the design; and the quatrefoil lights in the lower spandril adjoining the wheel are filled up solid, being represented only by exterior wall tracery. In regard to exterior effect we do not know that the change is for the worse; but internally it is certainly a loss not to have the two small lights in the spandrils below the window, which still form a pleasing and characteristic incident in the south transept window, and the loss of them in the north transept is to be regretted, nor can we see any compensating advantage in it. In regard to the general design of the circular window there is no doubt that it is richer and finer in effect than the form shown in Brayley, and which is seen also in the south window, but the mischief is that it does not suit the old glass, and the figures of the Apostles and Evangelists (we believe they are) which figured so well in the old lights, have actually been put in again shortened by the feet to make them go into the shorter lights. Such a sheer piece of bungling as this seems almost incredible. We can only conclude that Mr. Pearson intended to do away with the old glass and have new designed for the new window; and that after the tracery was executed he was compelled to reinstate the old glass. That some such explanation as this is at the bottom of the matter we must charitably hope; but it is an absurd business at the best.

**T**HE intended memorial to Lord Salisbury, set on foot by the "Society for the Preservation of the Monuments of Ancient Egypt," came before the meeting of the Institute on Monday, and lay for signature in the entrance lobby after the meeting, though the small number of signatures did not say very much for the interest felt in the matter by those present. The memorial, after recounting some of the points of interest and historic value in Egyptian art, continues:—

"Unhappily, the destruction which has been in progress during centuries has of late years been carried on with increased intensity. The growing prosperity of the country has naturally created a demand for building materials, and the ancient monuments are now, as formerly, resorted to as convenient quarries. Miracles of the sculptor's art and vast wall spaces, on which are inscribed the documents relating to the earliest civilisation, are broken up for rubble or cast into the lime kiln. But the worst cases of destruction have arisen from other causes, as in the recent most notorious mutilations at Beni-Hassan. Here, and at other places, portions of the most interesting paintings and sculptures in Egypt were ruthlessly cut away, evidently for sale; and this source of destruction can only be met by constant vigilance, and by a system of inspection more thorough than can be exercised by the director of a large and important museum."

We believe that it is owing to the suggestion of members of the Institute of Architects who are interested in the subject that one slight

but important alteration has been made in the wording of the final petition of the memorial. This ran originally:—

"We are strongly of opinion that the devastation can only be prevented by placing the monuments under proper inspection. We, therefore, most earnestly plead that your Lordship will direct your Agent at Cairo to move the Egyptian Government to appoint an English Official Inspector fully qualified for the performance of the duties proposed, who should be instructed to submit, with view to their publication, yearly reports of his proceedings."

To have specially stipulated that the Official Inspector should be an Englishman would be casting a slur on the French, who took an enlightened interest in Egyptian monuments long before we did. It was accordingly suggested by the Art Committee of the Institute that the words "a competent official" should be substituted for "an English official," which has been agreed to, and the memorial now stands in that form.

**T**HE Scientific Committee formed to promote the search for coal in the south-east of England appears to be exceedingly earnest in its endeavours. Two meetings have recently been held with the object of placing the scientific aspect of the matter before the public—one at Ashford, on the 13th inst., under the presidency of the Earl of Winchelsea and Nottingham, when Professor McKenny Hughes, of Cambridge, was the lecturer; and the other at Brighton, on the 15th inst., on which occasion Mr. Wm. Whitaker, of the Geological Survey, was the exponent. An outline of the geological argument affecting the occurrence of coal-measures in our south-eastern counties, with special reference to their probable mode of distribution in Kent, has already appeared in our columns, and we have nothing to add to our previous remarks from that point of view. It was evident from the enthusiasm of the Ashford meeting, however, that the question is not altogether a scientific one. As Lord Winchelsea said, whilst agreeing with the object of the committee, Kent is justly proud of her beautiful scenery, and her people would regard with jealous eyes any attempt at spoliation,—all of which we most cordially endorse. Still, it must be remembered as a melancholy fact that the greatness of the nation has not been produced and cannot be maintained by the contemplation of the beautiful. Our position as manufacturers, as everybody must know, is largely dependent on our supplies of coal and iron, and without the former the exploitation of the latter is practically impossible. No one can have regarded the evidence of the duration of our coal supplies (as detailed by the Royal Commission appointed to inquire into that and cognate subjects), and borne in mind the increasing demand for that useful substance, without being struck by the fact that at no very distant date its price must be considerably augmented, and the time must arrive when the supply will fall short altogether.

**T**HE Railway Commissioners have this week been called upon to give effect to the Act of 1883 with respect to "undue preference." It will be remembered that, after much "amending," the section dealing with this subject ultimately gave the Courts considerably enlarged powers in this matter. In a condensed form the clause runs as follows:—"Wherever it is shown that a railway company charges the traders in any district lower rates for the same or similar services than the charge to the traders of another district, the burden of proving that such difference in treatment does not amount to an undue preference shall lie on the railway company." The case under notice was brought by the Liverpool Corn Trade Association, but the principle underlying it renders it of equal interest to all classes of traders. The complaint was that the traders of Cardiff were given an undue preference as compared with those of Liverpool, by the granting by the railway company of low rates to Bir-



tingham,—the rate from the former place to Birmingham being less than that from Liverpool, although the distance is nearly twice as great. The intervention of the Board of Trade in their mediatorial capacity having been invoked without success, the case was brought before the Commissioners for decision. The railway company relied for their defence upon the sub-section authorizing the Commissioners to take into consideration "whether such lower charge is necessary for the purpose of securing in the interests of the public the traffic in respect of which it is made." In this case they held that they were consulting the public interest by granting the low rate complained of, and we believe this is the first time this plea has been put forward. Mr. Justice Wills showed, however, that the public interest would not suffer by the withdrawal of these rates. He considered that Liverpool was entitled to be freed from competition that was unfair, and that this was a case in which the Court had power to restrain it. Consequently, the railway company will have to remove the inequality, and this will doubtless be effected by the withdrawal of the Cardiff rates, the traffic from that town being of far less importance to them than that from Liverpool. This judgment (in which each Commissioner concurred) establishes a precedent which the railway companies will probably regard with a considerable amount of apprehension.

IN the last issue of *L'Architecture* M. Deslignières discusses at some length the various schemes for a metropolitan railway for Paris, without finding any of them satisfactory. He is of opinion that the making of an extensive underground railway would cause (as our Paris correspondent has already suggested) an infinity of inconvenience in the making, besides encountering great difficulties from the nature of subterranean Paris, and that the difficulty also of adequate ventilation would be very great in a railway which, according to the schemes set forth, would contain lengths destitute of external communication twice as great as the longest of such lengths in the London Metropolitan Railway, which is, as he truly observes, very inadequately ventilated and oppressive to travel on. M. Deslignières urges the abandonment of all idea of steam locomotives and heavy carriages, the adoption of small and light carriages and electric motors, and the restriction of the proposed railway to a line forming a connexion between the various main terminal stations of Paris, and not attempting to communicate with all the suburbs. Such a railway, he urges, could be laid in many parts of its route above ground, and only be subterranean where absolutely necessary. We presume the writer contemplates some such railway as that which connected the Pont de la Concorde with the centre of the Paris Exhibition last year. That was a very convenient and handy little railway, and took its gradients in so light-hearted a manner as to have no difficulty in burrowing rapidly underground at certain points to get under a main street, and coming up to the surface again. It is possible that a railway of this type may be the best means, after all, of meeting all the conditions of the case in Paris.

IN reference to the second (this time "limited") National Monument Competition for Germany, for which invitations were issued under direct supervision of the Emperor last September, we have already mentioned that the majority of the artists invited to compete had the intention of sending in a protest as to the non-mention of the assessing body. A formal protest has accordingly been sent in to the Chancellor, desiring (1) the mention of the names of the jury or assessors; (2) the assurance that the competition designs shall be publicly exhibited; (3) the assurance that the first prizeman shall have the erection of the monument. An official reply has been given by the Emperor's command, the purport of which is that but one de-

mand, "the public exhibition of designs sent in," will be granted. This reply, and the manner of it, has caused much displeasure in artistic circles in Berlin, where the decision as to the course about to be taken by the artists concerned is eagerly expected. It may be of interest to know that of the eleven invited to compete, five—Messrs. Hilgers, Pfann, Rettig, Schaper, and Bruno Schmitz—signed the protest, in concurrence with the ideas of Messrs. Donndorf and Siemerling. Messrs. Hildebrandt and Schilling refused to sign, and the Emperor's favourite, Reinhold Beggs, had, of course, to keep aloof from his fellow-competitors in this matter.

WE hear from Berlin that the very stringent and harassing "Building Regulations of Berlin, 1887," are likely to be altered a couple of years hence, if the complaints be regularly and systematically continued. The fire-brigade authorities, who under their former chief caused some of the most extravagant rules to be made, are likely under the more commonsense management (under which the Theatre Building Regulations were revised last year) to have to drop a number of their more exacting requirements in favour of some few others which promise to be more in harmony with general public interests.

WE hear from Paris that there is talk of extending the lines of study open to students of the French Academy at the Villa Medicis, and that whereas hitherto the travelling students have been restricted to Greece, Italy, and Sicily, it is proposed that they should in future have authority to include Spain and Holland in their travelling study-ground. We presume therefore that the official authorities presiding over art-education in France are beginning to awake to the fact that something more than the study of the remains of Classic architecture is desirable as a part of the education of a modern architect, and that the "envois de Rome" are not forever to be restricted to drawings and restorations of Classic temples, however ably carried out. They have been a good while in coming to this conclusion, but better late than never. Perhaps in time we may even hope to find that French architectural students are encouraged to study the monuments of architecture in England, of which French architects (as M. Planat's "Encyclopédie d'Architecture" amply testifies) are for the most part deplorably ignorant.

IN connexion with the scheme for bringing Vienna proper and its suburbs under one municipal body,—i.e., the formation of a so-called "Gross Wien," which is soon to take place, the local authorities, and also the architectural and engineering societies, are busy with plans for alterations and extensions of the present building laws. Among the alterations proposed are some important ones, which, if adopted, will invest the municipality with powers to prescribe not only the form of buildings to be erected (whether street frontages or detached residences, &c.) in different streets and parts of the city, but also the relegation of certain kinds of buildings (factories, offices, shops, &c.) into certain districts to be strictly defined. A set of regulations in respect to the modification of the heights of buildings is to be formed. For this purpose a new system, according to which the city will be divided into several zones, for each of which different rules for the same street-widths will be in force, is likely to find favour.

AT the professional meeting at the Institute on Monday it was satisfactory to find that the attempt of a very irrepressible associate member to make capital out of the discussion about the Whitfield Chapel competition, by bringing forward a motion to discuss the conduct of the assessor, was put a stop to, a majority voting that it was *ultra vires*. It was more than that, it was a piece

of exceedingly bad taste, which the Council ought never to have allowed to pass at all; as indeed, judging from the remarks of the President, they seem to have been rather inclined to think themselves. An incident in the meeting was the presentation of a copy of a publication de luxe on the architecture of Jeypore, presented by the Rajah of Jeypore; the first occasion, probably, that a native Indian potentate has presented the Institute with a work illustrative of Indian architecture. Of this work, brought out under the superintendence of Colonel Jacob, and in which the drawings are all made by native draughtsmen, we shall have more to say. The Secretary also announced that the Institute had at last succeeded in securing for the Library a copy of the very rare "Editio Princeps" of Vitruvius, which the Institute has long wished to possess, and for which their Library is certainly one of the fittest resting-places, as it will thus be easily accessible to all architectural students who wish to refer to it.

THE Chancellor of the Diocese of Rochester has reserved his judgment in a case of some general interest. The vicar of St. Peter's, Brockley, applied for a faculty to put bells in the church at that place; the application was opposed by some of the parishioners, on the ground that the noise was objectionable and injurious to health. With due respect to the Chancellor, the objection appears untenable as regards the grant of a faculty. It is not an ecclesiastical objection, it is not one against the lawfulness of bells in a church. Neither, we may observe, can bells be pronounced a legal nuisance till they are heard. But the opposition shows the growing dislike of church bells in populous places. Such dislike, if the bells are in fact a legal nuisance, can take a practical form: because, if church bells are a legal nuisance, they can be stopped by an injunction from the Court. This is clear law. But we do not think the fact that they may be a nuisance is a valid objection to the grant of a faculty. But vicars and churchwardens ought to hesitate long before they allow peals of bells to be placed in churches in towns. In such a place as Kensington, to take one instance only, they are a nuisance, injurious to health, and an anachronism into the bargain. They are a survival of a pre-watch-and-clock age, and it is high time that the practice was discontinued, except in rural districts, where it is yet of some use.

THE case of "Noble v. Yates," tried by Mr. Justice Charles and a jury last week, should be noticed by house-owners and intending tenants. It was an action against a house-owner by a would-be tenant for damages sustained through being injured when looking over a house which it was proposed to take. The jury found a verdict for the defendant. There seems, however, to be no doubt that if a person goes into a house which is to be let, and falls, as the phrase is, into "a trap," that the owner of the house would be liable for damages, as, for instance, if a piece of an apparently sound flooring were to give way. On the other hand, people who go over houses must be careful. If they have been guilty of contributory negligence, they cannot, of course, recover damages. The moral seems to be that each party must be careful, but in some respects the chief care should be that of the landlord, who must have no missing steps and similar "traps," which are so conducive to accidents.

THE verdicts of juries on railway accident cases are often bewildering (or rather bewildered), but that of the coroner's jury on the Norton disaster is one of the most extraordinary we have ever come across. As the coroner said, it was no verdict at all, or amounted to "accidental death." Not even a word of blame was directed against the signalman, who absolutely confessed that he forgot his duty (though, as we observed, a man's



brain will trip sometimes without implying moral negligence; not a word (still more extraordinary) is said about the danger of permitting shunting on to a main line in the middle of fast traffic, for which the company and their regulations are morally responsible; and the only person blamed is the unfortunate driver of the goods train, who was a passive agent in the matter, who was told nothing and simply followed orders in being where he was! It is difficult to look with any patience on the "palladium of English liberty" when it becomes the field for the display of such stupidity as this, and in a matter of life and death too. The coroner persuaded the jury to accept the word "negligently" in regard to the action of the signalman, which gave a legal ground for committing him for trial, and when that second trial comes off it is to be hoped we shall hear a different kind of verdict from that of the coroner's jury, in regard to the responsibility of the railway company at all events.

IN spite of the figures put forward by the railway companies to demonstrate that the adoption of the Board of Trade rate proposals will involve loss of revenue, it appears that these same proposals are still, in some quarters, considered inimical to the interests of the traders. The South Wales colliery proprietors, for example, regard the Board of Trade schedules as calculated to aggravate existing evils, and do irreparable damage to the South Wales coal trade. The Department is blamed for not adopting the present rates as maximum charges, though this it would be clearly unjust to do. It appears from the report of the Collieries Association that coal is carried to Cardiff and other ports at an average rate of a 3d. per ton per mile, and it is obviously useless to expect such low rates to govern the charging power of large railway systems. Different sections of a line will, as before, be favoured or not according to circumstances, but the purpose of the new schedules is simply to fix limits beyond which no rates may rise. Sir Michael Hicks-Beach stated on the 14th inst., at Clifton, that he believed the result of the Board of Trade revision of the schedules to be a considerable reduction of charges as compared with those now authorised by law; and this, together with the strenuous opposition of the railway companies to the schedules, should reassure objectors generally; though, of course, the proposals of the Board may be open to criticism upon certain specific points. The report alluded to, for instance, quotes a case in which a railway company is granted higher powers than it sought for, and the Board should certainly not hesitate to accept an amendment to their scheme upon this being established.

FROM the sixty-third annual report of the Council of the Royal Scottish Academy, which was submitted to the Academicians last week, we gather that several bequests and grants have fallen to the Academy during the course of the year. Amongst these is one for the behoof of decayed Scottish artists, by the late James Nasmyth, of Hammerfield, Penshurst, Kent, in memory of his father, Alexander Nasmyth, "the father of Scottish landscape painting;" and a grant of 5,000l. by Mr. William McEwan, M.P., for the purchase of works of art for the National Gallery of Scotland. The Council emphasises the protest of the Academy against any interference by the rival railway companies with the Prince's-street-gardens or destruction of the amenity of Prince's-street for railway and other purposes, "which would take from the attractiveness of the city upon which so much of its prosperity depends—a result which would ever be deplored by lovers of the beautiful, and, indeed, by all who will give the matter careful consideration." It is stated that no further information has been received from the Privy Council by the Academy regarding the proposed Supplementary Charter.

IT is announced in the *Academy* that the committee which was formed in May last to buy Dove Cottage, Grasmere, as a national memorial of Wordsworth, have obtained a conveyance of the premises, and have entered into possession. Wordsworth lived here from December, 1799, to the spring of 1808; during that interval he married, worked at his "Prelude," "Excursion," and "White Doe of Rylstone," made acquaintance with Southey, Scott, and Sir George Beaumont, and was visited by Coleridge and De Quincey. It is related of De Quincey that he turned back when he had reached the threshold, just as Rogers did from Dr. Johnson's doorstep in Bolt-court. We are informed that the high-level garden, the well, the sitting-room, the poet's bookshelf, and the like, remain as of old, though some intervening houses now obstruct the view from the cottage towards the lake. Other houses in this neighbourhood that are associated with Wordsworth are Allan Bank, the Parsonage, and Rydal Mount. The committee ask for contributions towards putting the cottage into good repair, replanting the garden, and so forth. They also invite the loan or gift of such articles as shall form a museum to illustrate the poet's life and work.

NEARLY three years ago\* we adverted to two projects for re-opening the Alexandra Palace and its grounds, which then belonged to the London Financial Company, as a place of recreation for the public. On May 12 of that year the Palace was re-opened by a company who had obtained a seven years' lease of the property. We now read, in the *Daily Chronicle*, that final steps are about to be taken to demolish the Palace, and that Parliamentary powers will be sought for to convert the ground into building sites. So the counter scheme of 1887, to buy the land as a Jubilee Memorial, for the public benefit, seems to have come to naught. But it will be a great pity if the whole of these beautiful grounds should be thus lost to the vast population of North London. The palace itself (unfortunately a very ugly building, both in its first and later edition) was originally constructed, for the most part, with materials from the Great Exhibition of 1862 (Captain Fowke, R.E., architect), including one of the two great domes, dodecagonal at base, and 160 ft. in diameter. That building was opened on May 24, 1873, but a fortnight later was entirely destroyed by fire. Having been rebuilt, it was again opened to the public on May 1, 1875, and for a while formed a highly popular resort. Portions of the grounds are finely timbered, and command extensive views over the northern limits of the county.

WE have received from Mr. Brawn, of Chelsea, a description and illustration of a fire-escape for dwelling-houses, which appears to deserve attention. It consists of a metal bracket fixed to the woodwork of the window frame, and carrying a double pulley through which an endless rope is rove, of such a length that the lower bight will just reach the ground. A leather sling is fixed on the upper end of the rope so as to hang opposite the window, and a similar sling on the lower end, so that when one occupant gets into the upper sling and has lowered himself to the ground the other sling has mounted to the window on the opposite length of rope, ready for the next person, so that there is no waste of time in sending the sling up again. The speed of descent is regulated by a brake action on the pulley, which operates automatically in proportion to the weight of the person descending. The attachment of the escape is fixed inside the room, and we presume it is intended that the rope should be coiled inside the room and the bracket swung outward for use. The patentee quotes Captain Shaw to the effect that "It is both safe and simple, requiring no skill to manipulate, and I would not hesitate a moment to descend

by it." Women however, and elderly men of nervous temperament or who are clumsy with their hands, may have another opinion. They will however find it better than being burned, and the contrivance seems to answer the main desideratum of being always ready for use, without occupying much space or forming a special feature on the exterior of a building.

THE remarks of the jury and some of the newspapers in regard to the case of the School Board for London v. Wall Bros. indicate an entire misconception as to what an architect occupying the position of the School Board Architect could accomplish. The fault is really with the Board themselves, who did not provide for sufficient supervision of their schools. The action was brought to recover damages from the defendants for the expense incurred by making good their bad work. In the course of the case it appeared that one clerk of works had several schools under him at the same time, which of course meant that any real and effective supervision was impossible, and Mr. Robson stated that he only visited the schools when completed, in order to study the result with a view to further school designs. The judge, in his summing up, while commenting strongly on this state of things, does appear to put the blame on the right persons, the School Board and their system; but we have no doubt the comment of the jury in regard to "the state of things in the Architect's department" was meant as a condemnation of that department itself. But it must be obvious that Mr. Robson, though a man of great power of getting through work, could by no possibility have undertaken personal supervision of all the schools going on. He was more than fully occupied in merely planning and devising all the schools that were going on one after another as fast as they could be done, and was at one time quite over-worked at that. The real fault was with the Board, who were pursuing a system of false economy in making one clerk of works do the work of three or four, and expecting one architect to look after and design all their schools. They should have retained Mr. Robson's services as consulting and directing architect, and employed outside architects for the actual designing and carrying out of the various schools, in subordination to the consulting architect's main idea. Then they could have ensured the work being properly carried out. Their system was a system of impossibilities, carried on under a false notion of economy, and from such a system unsatisfactory results might be expected.

THE opening address of the President of the Leeds and Yorkshire Architectural Society, delivered on Tuesday last, dealt largely with the subject of education, and supported the idea of the Institute examination as likely to afford in the end the best practical form of diploma for those who favoured the idea of some recognised guarantee of the architect's professional competency. In commenting on some local topics, Mr. Thorp referred to the new Post-office at Leeds as a building which did not at all rise, architecturally, to the importance of its position and scale in the town architecture. This is another of these buildings turned out from the architectural room of the Office of Works, and if it is like what we have recently seen in other cities, we do not wonder that it became the subject of some criticism. In our opinion some such body as the Royal Academy or the National Art Association ought to memorialise the Government or the First Commissioner of Works in regard to the injury done to architecture in this country by entrusting the designing of these large buildings to officials with probably very adequate practical knowledge, but totally destitute of architectural genius. The move could not be made, of course, by any such body as the Institute of Architects, as they would subject themselves, however undeservedly, to the

\* See the *Builder*, February 11, 1888.



charge of being influenced by selfish motives but we certainly think the matter ought to be taken up by some constituted body which is interested in art. As it is, one town after another is having large buildings of coarse and vulgar architectural design inflicted on it, because the Office of Works prefers the economy of supplying architectural designs from the hands of its own staff. In France every such building would probably be the subject of an open competition with the object of getting the best architectural design possible; and it ought to be so in England.

THE special feature at the French Gallery in Pall Mall, which opened its winter exhibition this week, is a collection of a certain number of Mr. Leader's landscapes, including several of the large and well-known ones in which the composition and motive are very similar, such as "At Evening Time it shall be light," "February fill Dyke," &c. In these and others the artist has worked out with great care and finish a kind of receipt for a poetic landscape which has become exceedingly popular, because it appeals to the ordinary perceptions of ordinary persons, and is finished with that kind of neatness and smoothness which the ordinary person (in a picture gallery) especially loves. Pictures of this kind, with evening skies reflected in rain pools in the meadows, give innocent pleasure to so many people that one cannot grudge them, even if unable to join in the chorus of applause over this superficial art. Occasionally Mr. Leader shows that he could do better things than paint for popular applause, as in the bright little work "Spring Time" (62) and in "Sunshine after Rain North Wales" (79), a small picture with much more of natural and open-air truth and freshness than his larger and more popular works. Among the other paintings in this year's exhibition may be noticed "The End of the Day" (1) by Sadée, an idea which both this painter and Israels have treated before; "Musical Critics" (4) by Jimenez; "A September Morning" (16) an admirable cattle and landscape picture by Emile Claus; "Dutch Pastures" (68) by W. Roelofs; "After the Charge" (71) by Koekkoek, a pathetic picture with a great deal of expression in some of the figures, but rather crude and harsh in colour; and "A Village Smithy" (99), by E. A. Schmidt, a little interior which is a marvel of realistic truthfulness in detail.

WE hear with some dismay that the commission of architects dispatched by the Spanish Government to the Alhambra, in order to ascertain the damage caused by the recent fire, has finished its task, and reported that "the building can be restored at comparatively little cost." Can it? That may prove worse than the fire.

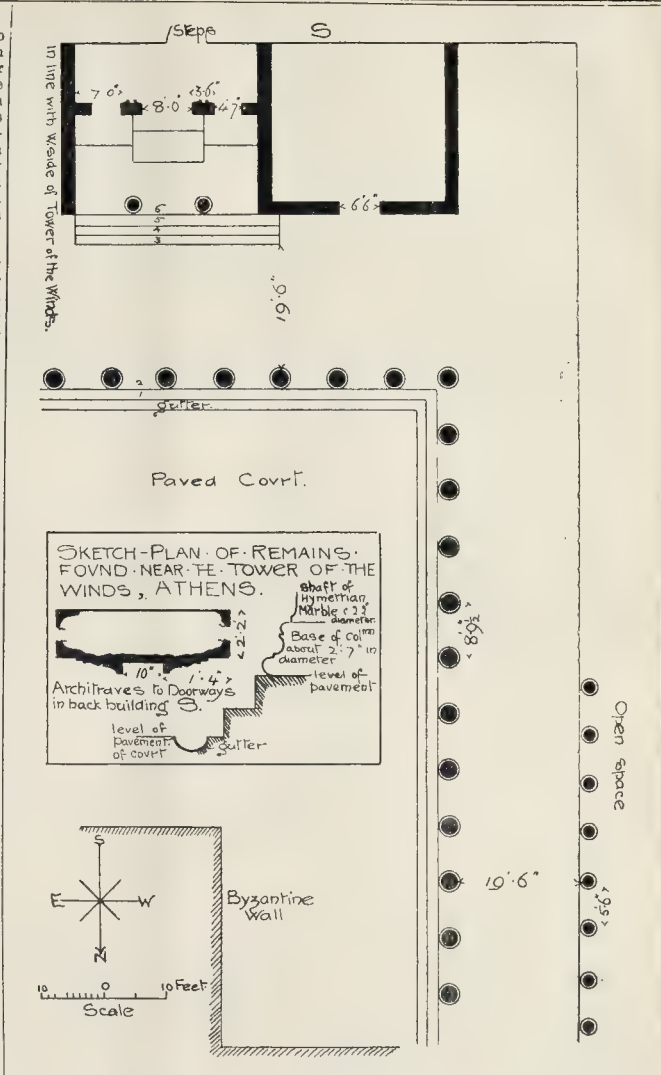
#### A LETTER FROM ATHENS.

THE following communication from Professor Aitchison, who is at present travelling—partly, we believe, in order to collect materials for his next course of Royal Academy Lectures on Architecture,—will be of interest to our readers:—

"Athens, November 8, 1890.

SIR,—I thought it might interest some of your readers to know that excavations are now being made close to the Tower of the Winds, on the west side of the sloping road, and to the north of the tower.

A portion of an agora or open peristyle has been discovered, possibly a part of the Stoa of Hadrian. There are eight columns on the south side and twelve on the west side; all these columns have Attic bases, the lower torus resting on the pavement without a plinth, and with shafts of Hymettian marble from 14ft. to 16ft. high from the pavement—i.e., including the bases. Beyond this peristyle is a space of about 19ft. 6in. Southward of the south portico is a chamber with three doorways, in front of which is a pronaos with two columns. To the west of the west portico are nine shafts without



bases. Amongst the numerous fragments found are many Ionic caps, as well as some Doric ones, with fluted shafts. One of these fluted shafts is standing in the area with an unfluted Hymettian shaft on it. Parts of the excavations are bounded by banks of earth and part by a Byzantine construction of stone with bricks in the joints.\*

As regards the Acropolis, it is greatly to be regretted that sculptural fragments are left exposed to the air. Some pieces that have been from their position protected from the weather have the carving almost perfect, and some of the coffers have the most distinct traces on them of the patterns that were painted or gilt. The Panathenaic frieze that still exists on the wall of the Opisthodomos of the Parthenon is exposed to the weather, the offering having fallen. A temporary roof would not only protect the sculpture, but also restore the original effect, as it was lit from reflected light from below. The same remarks apply to the portico of the temple of Minerva Polias, the doorway of which is exposed. It also is to be regretted that a copy of the sculpture on the temple of Nike Apteros is not substituted for the real sculpture and the actual

\* The accompanying plans are drawn out as nearly as possible to scale from the measurements given on Professor Aitchison's sketches.

pieces placed in the museum. As we owe the re-erection of this temple to the munificence of Dr. S. Hliemann, he would hardly object to the preservation of the actual sculpture.

The remarks about a temporary roof between the columns and the walls of the naos equally apply to the Temple of Theseus.

No care is bestowed on the remains of Jupiter Olympius. The boys who play about these ruins amuse themselves with breaking off pieces of the fillets of the fluting, as many of the fractures are quite new. The volutes from the fallen columns have disappeared, and the sculpture of the capitals will soon be destroyed.

G. AITCHISON.

#### THE SURVEYORS' INSTITUTION:

##### THE PRESIDENT'S ADDRESS.\*

THE first ordinary general meeting of the present session of the Surveyors' Institution was held on Monday evening, the 10th inst., when the opening address was delivered by Mr. Robert Collier Driver, President.

Having thanked the members for his election to the position of President of the Institution, he proceeded to review some of the Bills introduced into Parliament during the past ses-

\* Unavoidably postponed from our last issue.

sion. In the course of this part of his address, he said:—

The Public Health Acts Amendment Act contains some important conditions relating to drain-connections and made-up sites, to which members of the Institution, practising outside the administrative county of London, will do well to give attention.

One of the most important measures, from a surveyor's point of view, and one of special interest to our Institution, is what is known as the General Powers Act of the London County Council, which received the Royal Assent on August 18. The sections of this Act which specially concern us as surveyors are the 27th to 30th, 32nd, 33rd, 35th, and 36th. The Council of the Institution were of opinion, and urged in the proper quarter, that as regards Section 27, the sittings of the tribunal for the approval of plans should be continuous throughout the year, and that the points objected to and the reasons of adverse decisions should be stated; but their representations as regards this point did not apparently commend themselves. As regards Section 28, which concerns the fixing of the general line of buildings by the Superintending Architect of the Council, it had long been felt to be a grievance that no right of appeal existed against a decision which might prejudicially affect valuable building sites, therefore it speaks well for the London County Council that a tribunal of appeal has been voluntarily conceded, and no better court for the purpose could well be desired than one constituted of a nominee of the Surveyors' Institution, as representing property, a nominee of the Royal Institute of British Architects as representing public taste, and a nominee of the London County Council as representing municipal control.

The Council of the Institution were not of opinion that it was desirable to fix a new limit for the cubical contents of buildings in place of the 216,000 ft. prescribed by the Building Act of 1855. Although the limit has now been extended to 450,000 cubic feet, the concession is guarded in the Act by conditions which remove some of the objections which the Council entertained to the proposal. It was felt very strongly that the original proposals of what is now Section 33 of the Act might result in serious injury and loss to the owners of corner plots. There was no objection to the proposal that in the laying out of new streets the line of frontage should be continued through until it met the lines of frontage of adjoining streets; but the Council felt, and stated that, where buildings already exist at the corners of streets, the application of such a rule, however desirable, would cause such injury to the owners that it should only be carried out on giving compensation. It is satisfactory to observe that words have been introduced specially exempting existing rights from the operation of the clause.

The proposal to limit the height of new buildings to 70 ft. was modified in Committee to 90 ft. from the level of the ground to the level of the parapet. This is probably a reasonable compromise, and will save London from a multiplication of the monstrosities which threatened to invade the skies, without putting too much restriction on building-owners.

The London Streets (Removal of Gates) Act was a measure which can hardly fail to considerably affect large masses of property in the central districts of London. The Act makes provision for compensation to the freeholder for "injuriously affecting." It is, however, matter of common knowledge that a large number of the houses in these secluded streets have been taken by persons to whom quiet is a special object, on the strength of the exclusion of general and particularly night traffic. These are the persons whose bargains are disturbed by the Act without provision for compensation of any kind whatever, and who, unlike yearly tenants, will be denied even the consolation of a lowered rent for many years to come.

The Housing of the Working Classes Act is one of the most important measures of the session. Speaking generally, it is a consolidating Act, and proposes to deal in a very comprehensive manner with so-called insanitary areas and unhealthy dwellings, both in towns and in the districts of Rural Sanitary Authorities. The re-housing provisions, which formed the principal obstacle to the carrying out of what are known as Cross's Acts, are re-enacted; but, on the other hand, the law relating to the assessment of compensation is modified by making evidence receivable that the rental of the property was

enhanced by its illegal use, that it is a nuisance within the meaning of the Acts relating to nuisances, or that it is not capable of being made fit for human habitation. The arbitrator is authorised to award compensation under either of the first two categories, on the basis of the lower rental obtainable if the premises were legally and properly used, and, in the case of the third category, on the value of the land and the mere materials of the buildings.

No surveyor, worthy of the name, however jealous of any infringement of the legitimate rights of property, will find fault with provisions which prevent unscrupulous persons from obtaining compensation on rentals swollen by a disregard of the principles of humanity and common decency.

As local authorities are not empowered by the Act to re-cover the cleared sites without the special approval of the confirming body, it is to be hoped that the effect of the diminished compensation paid will be to enable them to offer the sites on such terms as will induce Improvement Societies and other responsible bodies to engage in the work of reconstruction.

The London County Council have already taken the initiative with a scheme for the improvement of about fifteen acres in one of the worst districts of the Metropolis, and the result will be awaited with sympathy and interest. But with every desire to see many of the acknowledged evils of overcrowding promptly remedied, I have great doubts whether much will be achieved under this ambitious measure.

The fatal weakness which underlies all this class of legislation is the assumption that the rates are an inexhaustible fund on which to draw for every purpose that may be in the abstract desirable; whereas, as a matter of fact, the ratepayer is already saddled with an almost intolerable burden.

I would, however, guard myself from being taken to imply that there has been any sensible addition to the burden of local taxation in country districts during recent years, and in this opinion I am fortified by the views of one of our most esteemed and experienced members, who has carefully investigated the question in almost every county in England.

However this may be, the latest available returns of local taxation show that there has been a steady increase in the total amount of rates levied in England and Wales during eight years of this decade.—the rise being from 22,160,099*l.* in 1879-80 to 27,194,836*l.* in the year 1887-88.

This enormous increase, amounting to 5,034,737*l.*, representing 22½ per cent. in eight years, is accounted for by an extra 1½ millions swallowed up by the Metropolitan authorities, 2½ millions by municipal corporations and Urban Sanitary Authorities, 123,000*l.* by Rural Sanitary Authorities, and more than half a million by extra-Metropolitan school boards.

Add to this the startling fact that the outstanding loans (some of course productive) of local authorities increased from close on 137 millions in 1879-80 to over 192 millions in 1887-88, or about 29 per cent., and we have some measure of the enormous burden which the ratepayers now have to carry, and which Parliament is continually adding to by new legislation for objects most beneficent in intention but very costly in execution. It is to be hoped we are not drifting into a disguised system of State Socialism.

Within the last few weeks we have witnessed a revival of the project of the purchase of the London water companies. As the President's address is happily free from liability to criticism in this room, I may, without fear, venture the opinion that London will never again get so good a bargain as was placed within its reach by the ability of our late distinguished colleague, Mr. Edmund James Smith, whose proposals fell a prey to political exigencies, and who may be said to have died a martyr to the cause. . . .

While upon the subject of house property, I may note the remarkable change of habit which in London is coming over a large section of the population possessed of moderate means. I refer to the great development of the system of collective occupation of dwellings in what are known as flats. The system is, of course, no novelty in Continental towns, and in Scotland (possibly from its close connexion with France during the times of the Stuarts) flatted houses have existed in large numbers for some hundreds of years. Whatever be the cause of the change in London, whether it be the domestic service diffi-

culty, the loss of time involved by the daily journey from the constantly-receding suburbs, or a symptom of the co-operative tendency which appears to be entering into every consideration of life, the fact remains that the system has greatly extended within recent years, with the result of a return wave of prosperous people to districts of London from which a few years ago they appeared to have permanently departed. The effect upon London trade and upon the value of land in localities suitable for the erection of buildings of the kind is becoming noticeable, and a person of a fanciful turn of thought might in his mind's eye picture the city merchant living once more hard by the scene of his daily labour. Oddly enough, the system which has been so long in vogue in Scotland is there now falling into disfavour, the tendency being to self-contained dwellings. I propose, during the session, to read a paper on this subject.

A subject on which I can speak with some knowledge is British forestry,—at least in one of its aspects,—the realisation of its products, in which my experience has been neither short nor slight. I believe that, in selected situations, larch, oak, and beech can all be grown at a profit, especially if the crop be credited in its early years with a share of the profit derived from the shelter it affords to the surrounding land.

There is no doubt that home-grown timber reached its lowest level, within living memory, ten or fifteen years ago. The last two or three years have seen a gradual improvement; oak has improved from 4*d.* to 8*d.* per foot, ash has kept the lead as the most saleable timber for some years, and now realises as much as, and in some places more than, oak. The devastating storm of October, 1881, so flooded the market with elm that the price fell 50 per cent., and it is only within the last two years that any decided recovery has become apparent. Beech has nearly recovered the position it held eight or ten years ago.

The Institution has shown its sense of the importance of the Forestry question in England by establishing a special examination, and granting a diploma of efficiency in the subject. It may be claimed that this is the first examination in home forestry ever held in England. The existing conditions in this country are not, in my opinion, favourable to the establishment of a National School of Forestry. The most that can be done for the present is to stimulate, by means of a special diploma of the kind, the ambition of young land-agents to a more careful study of the science with such facilities as already exist.

A few more words and I have done. The Session upon which we enter to-night will introduce an epoch most interesting as regards the future of the Institution. We stand committed to what is virtually a revolution in our constitution. It was assumed that ten years was sufficient notice to the profession of the impending compulsory examinations, and, speaking generally, we have secured the complete adhesion of the rising generation of surveyors, who have, in large numbers, been making their way into the Institution through the examination system applicable to the younger men. During the last seven years we have also been so happy as to draw into our ranks most of the leading surveyors of all classes in England and Wales. Any of our professional brethren, possessing the requisite qualification of five years' practice, not yet on our roll, have still for a few months the option of applying for admission without the ordeal of examination, and I can promise that their applications will receive all due consideration at our hands. It is to be earnestly hoped that the Institution will find itself completely representative of the whole profession before the advent of the important change to which I have alluded.

On the motion of Mr. E. P. Squarey, Past-President, seconded by Mr. Wheeler, Q.C., Associate, the thanks of the meeting were unanimously accorded to Mr. Driver for his address.

REGENT'S PARK BARRACKS. — The Household Cavalry barracks in Albany-street, Regent's Park, are about to be pulled down. The rebuilding, on an enlarged scale, including the hospital, and for which some adjacent property has been acquired, will be begun next April. It is stated that the existing quarters were condemned some ten years since, the drainage being found to be defective, particularly beneath the stables and the officers' mess-house.



## THE ARCHITECTURAL ASSOCIATION.

The third meeting of this Association for the present session was held on Friday, the 14th inst., in the meeting-room of the Royal Institute of British Architects, Conduit-street, Mr. Leonard Stokes, President, in the chair.

The minutes of the previous meeting having been read and confirmed, the following gentlemen were elected members, viz., Messrs. S. D. Adshad, R. G. Rendle, E. White, C. C. Brewer, P. P. Cotton, E. E. Sadler, R. M. Vining, F. Thompson, W. McClelland, F. H. Willis, F. Taylor, G. Lucas, G. E. Martin, and H. Legg.

The Chairman announced that the Committee of the Association proposed to nominate Mr. P. J. Marvin to fill the vacancy on the Committee caused by the resignation of Mr. Francis G. Hooper. The election would take place that day fortnight.

The Chairman also announced that the "Common Room" had been re-opened under entirely new management, and expressed the hope that it would be more freely used than in the past.

Mr. F. R. Farrow (senior hon. sec.) announced donation by the author to the library, entitled "The Parish of Hamsbury: being the first part of the Hundred of Hamsbury," by Mr. E. Doran Webb. A vote of thanks was accorded to the donor.

Mr. C. H. Brodie said he wished to refer to some remarks made by the President of the Royal Institute of British Architects in his opening address to the Institute. Those remarks, as far as they concerned the Architectural Association, were not very flattering, and were not altogether fair. In the first place, a very common error had crept into Mr. Waterhouse's address, in which the President said that he had heard that the more complete system of instruction of the Committee had not been adopted by the general body of the Association. That was not so. It was adopted, but was not carried out to effect owing to the difference as to the alterations of the rules which would be necessary to carry its adoption into effect. In the second place a comparison was drawn between the total number of members of that Association and the number of its members who also belonged to the Institute. To be just, he thought that comparison should concern only the members of that Association who were resident in London and its neighbourhood, because it was clear, and it had been spoken of and regretted on many occasions, that that Association could not help, to the extent it would like, students in the country. A little further on some remarks were made as to the number of men admitted to the Preliminary Examination; and it was stated that for the examinations held in Bristol, Glasgow, London, and Manchester, the total number of candidates was seventy-three, of whom only five were members of that Association. He must say again that that Association did not pretend to educate the young architects of Bristol, Glasgow, and Manchester, and the comparison should be with regard to the number of men resident in London and the neighbourhood who went up for that particular examination. He thought that if figures were given of the men who, since the institution of the obligatory examination, had passed that examination, a very large proportion of those men would be found to be members of the Association. A paragraph in Mr. Waterhouse's address referred to the register of architects' assistants. He (the speaker) did not know much about the register of the Institute, but he knew a great deal about that kept by the Association, and that register was a great success, and he did not think that any fault could be found with it. A little further on in his address, he noticed that it was stated that people calling at the Institute office on the subject of the Association made requests which were often unheeded. All he could say was that if the clerks at the Institute office would just refer applicants to Mr. Collins, to whom the Association owed a great debt of gratitude, their wishes would not be overlooked, and if Mr. Collins could not assist these applicants, he would put them in communication with those who could. He would like to ask whether any steps were being taken by the Committee for the appointment of a joint committee to confer with the Royal Institute of British Architects as to the means to be taken for bringing about a closer union of the two bodies? Mr. Waterhouse spoke of such a union,

and it seemed to him (Mr. Brodie) to be a very desirable thing.

The Chairman replied that the matter had not been before the Committee so far.

Mr. John L. Robinson, R.H.A., of Dublin, then delivered an interesting and amusing lecture, illustrated by a large number of excellent photographic slides, from photographs taken by himself, and shown by the oxy-hydrogen lantern, of buildings visited by the Association on its annual excursions during the last four years, viz., 1887, to Bath and neighbourhood; 1888, to Derby and neighbourhood; 1889, to King's Lynn and neighbourhood; and 1890, to Oxford and neighbourhood. As we have in each year fully reported these excursions, and illustrated to a considerable extent the buildings visited, it is not necessary here to go over the ground again. It will suffice to say that all the principal buildings visited were shown by means of Mr. Robinson's admirable photographic slides, his comments on each being characteristically pertinent and witty.

Mr. H. O. Cresswell, in proposing a vote of thanks to Mr. Robinson, said they all owed a deep debt of gratitude to their confrère, not only for the wonderful series of photographs he had shown them, but for the exceedingly pleasant way in which he had taken them for a personally-conducted tour through four different districts of England by the aid of dissolving views, and not less for the running commentary which he had made on the various buildings illustrated. Mr. Robinson had concluded his remarks with a few practical and pointed observations as to the advantages to be derived from attending the Association excursions, and he (Mr. Cresswell) thought it would be an advantage if a larger number of members attended. He himself attended this year for the first time, and he sincerely trusted that it would not be the last. They had a very enjoyable trip, with a great deal of interesting work to see; a great deal of sketching was done, and he thought a good deal of social enjoyment was extracted out of the excursion.

Mr. H. L. Florence seconded the vote of thanks. The younger members who had not yet been to one of the Association excursions would learn from Mr. Cresswell's experience and advice that there was much to learn in and much benefit to be derived from joining these excursions. It had been his good fortune to be present at a great many of the excursions, and he had attended all the four which had been brought before them that evening. He thought, however, that any attempt to increase very greatly the number of those joining the excursion was likely to result in some dissatisfaction. From the experience that he had had he thought that thirty was the largest number that could be conveniently arranged for. Seeing that they had had already some twenty excursions, the time was coming when they would not be able to find new and interesting localities to visit; he therefore thought that it was for the benefit of those who had not been to those excursions, if some old places were visited again; and instead of trying to make a very large party, which was very difficult to manage on account of the hotels and conveyances, smaller parties might be conducted by one or two of the older members who had previously visited the places.

A junior member, whose name was not announced, said he took part in the last excursion, and had tried to make a few sketches; but with the older men round him he had felt a bit nervous. The Excursion seemed to him to be a perfect scramble; in fact, he had heard the annual excursion called the "Annual Scramble." Would it not be a good idea if they had an excursion for junior members only, giving them a chance where they would have a little more time?

The Chairman, in putting the vote of thanks to the meeting, said he could not advise beginners to go on the excursions. They must first gain a certain facility with their pencils, as unless they could sketch tolerably freely, it would be much better for them to go by themselves, or with one or two others, and not with the Excursion. He heartily believed in the Excursion, although at one time he was prejudiced against it. He could not help thinking that Mr. Robinson was a public benefactor to the Association, and particularly to members of the Excursion, because the collections of photographs that he did for them yearly were particularly valuable, as they could not get them anywhere else. The views that they could buy were not generally architecturally interesting, but simply pretty views. Architectural detail

they could not get, as a rule, without Mr. Robinson's help.

The vote of thanks was then put and carried unanimously.

Mr. Robinson briefly replied, and the meeting terminated.

## DR. LEAF ON HOMERIC GREECE.

## IV.—DRESS AND ARMOUR.\*

THE question of Homeric dress, the lecturer began by observing, is not so slight as it might seem. It is intimately bound up with the wider question of Homeric culture generally. Dr. Helbig, when he brought out the first edition of his book, had come to the conclusion that the dress described by Homer was in the main Oriental, thus according with what he supposed to be the general state of civilisation of Homeric times, i.e., a condition scarcely to be regarded as Greek at all. The young Viennese archaeologist, Dr. Studniczka, on the other hand, has (in a book we reviewed some time back on Greek dress, "Die Altgriechische Tracht") clearly shown that the principal garment known by Homer was the peplos, a purely Greek piece of drapery. Dr. Leaf then proceeded, by means of illustrations, to draw a clear distinction,—often disregarded by even eminent archaeologists,—between the two main Greek garments: 1. The Ionic type, a *linen chiton*, fitting close, and having sleeves. 2. The Doric chiton, or, as Homer calls it, the peplos, woollen, loose, and sleeveless. The word *chiton* is Semitic, and the origin of the garment Asiatic; the Doric peplos is primitive Greek.

That the dress of the *women* in Homer was mainly the Doric peplos is shown by the fact that it is often spoken of as variegated, and wool, not linen, is the proper material for dyeing. Linen takes colour,—excepting certain shades of purple,—badly. Further, frequent mention is made of the girding of women's raiment, and girding implies the loose peplos, not the tight-fitting chiton. Lastly, we often read of brooches or pins, and these are in use for the loose peplos,—not needed for the tight-sewn chiton. Dr. Leaf referred to the story told by Herodotus of how the Athenian women slew the one surviving man who returned from Ægina with their brooch-pins, and how for punishment they were obliged to wear the broochless Ionic chiton. In addition to the peplos, the women wore often a *kredemnon*, or large cloak-like veil, which fell at the back of the head, and partly shadowed the face. Innovations are, of course, easier at all times in the dress of men than of women. Accordingly, we find that, in Homeric times, the Ionic linen chiton, both in its short and long form, was already universally adopted by men. Later, the Ionic chiton, as has been seen, was introduced at Athens, and in other parts, for women also, but was again, in part, suppressed, possibly by the national reaction after the Persian War. Previous to Homeric times,—if the Mycenaean sword-blades are to be taken as evidence,—men wore a sort of close-fitting short drawers, and a woollen cloak over them; but the evidence of prehistoric monuments, the lecturer observed, is, in the matter of both men and women's dress, very unsatisfactory. In addition to the outer cloak or chlaina, we hear of the pharos, which seems to have been usually white, sometimes purple, made of linen, and very probably, like the name, of Egyptian origin.

Turning to hair-dressing, artificial modes, like shaving, can be traced to pre-Homeric times, and it is noticeable that Paris is twitted with wearing his hair like a "horn," a method that can be illustrated from extant monuments. As regards armour, there is no break in monumental evidence, and it accords closely with Homeric tradition. The Homeric panoply of greaves, breastplate, helmet, spear, shield, was, with some very slight modifications, substantially the same as that seen on archaic statues of the late sixth and early fifth centuries B.C., and on the beautiful vase by Doris, who flourished early in the fifth century B.C.

THE COURT OF THE BLACKSMITHS' COMPANY have just conferred their honorary freedom and livery upon Sir John Fowler, Bart. A similar honour was bestowed some months since upon the two engineers associated with Sir John,—namely, Sir Benjamin Baker and Sir William Arrol.—*City Press*.

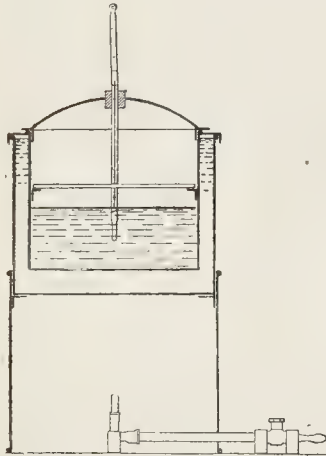
For reports of the previous lectures of this course, see *Builder*, pp. 303, 345, ante.



### APPARATUS FOR TESTING THE SOUNDNESS OF CEMENT.

THE annexed cut gives an illustration of the apparatus used by Mr. Faija, and referred to in his letter in our columns last week (p. 390 *ante*) on "Cement Tests," for determining the soundness of cement in a few hours.

The space between the two vessels is to be filled with water, the inner vessel being filled with water only to the height shown.



Mr. Faija says "the apparatus is based on the principle, which has been proved by practice, that moist heat accelerates the setting of cement, and that if judiciously applied the age of several days may be artificially given to a cement in a few hours. A sound cement acquires great hardness in a short time when treated in this apparatus, but an unsound one, or one that would under ordinary conditions "blow" when used in work, is caused to develop this characteristic in a few hours; and hence by the use of this apparatus, a definite opinion may be formed as to whether or no a cement is a safe one to use; independently, of course, of its tensile strength, which may or may not be equal to that required."

### METROPOLITAN GOVERNMENT.

By the new Bill which they will introduce into Parliament, the London County Council intend to ask for powers in regard to compulsory purchase of lands, the establishment of markets, and the superannuation of their officers; the removal of wires, with "other appliances" overlaid, and, generally, the regulation or prohibition of the erection of any structures for advertisement or other purpose which, in their opinion, "may cause danger to the public or tend to the disfigurement of London." Powers will also be sought for the following specific objects:—Acquisition of some land and buildings for approaches to the Millbank Prison site; the conversion of Bishop's Meadow, Fulham, into a public park, with the construction of a riverside embankment there; exchange of land at Plumstead-common, with Queen's College, Oxford; maintenance of Maryon-park, Charlton, the gift of Sir Spenser Maryon-Wilson; purchase of 74 acres of Bostall Woods, Plumstead; extension of Peckham-rye; formation of public recreation-grounds at Beresford, Limehouse, Trafalgar-road, East Greenwich, and by the new Hammersmith Bridge; new Fire Brigade Stations at Renfrew-road, Lambeth, and at the northern end of Clapham Common; widening of Fortess-road, Kentish-town, Fulham Palace-road and Queen-street, Hammersmith, and St. George's-place, Knightsbridge; new streets from Evelyn-street to Creek-road, Deptford, and Falkland-road to Fortess-road, Kentish-town; to substitute permanent bridges for the swing bridges at Preston-road, South Dock, City Arms, and Limehouse entrance,—being four in number,—Isle of Dogs; and for rebuilding, partly at the expense of West Ham District, the present iron bridge across Bow-creek in Barking-road.

In our leading article of July 26 last we com-

mented upon the Fortess-road, the Evelyn-street to Creek-road, and the Isle of Dogs bridges and approaches schemes. With respect to some of the others the following particulars may be of interest:—Peckham Rye: The proposed addition consists of the Homestead Farm Estate, about 49 acres, towards the purchase whereof the Charity Commissioners promised 12,000*l.*, under the City of London Parochial Charities Act of 1883, and the Camberwell Vestry 20,000*l.*, the freeholders having agreed to sell at 1,000*l.* per acre. The farm, a pottery, and two messuages, if not removed, would yield about 525*l.* yearly. At their meeting on July 29 last the Council approved a contribution not exceeding 18,000*l.* towards this purchase. Hammersmith: The Vestry applied to the Council to enable them to widen to 45 ft. the junction of Queen-street and Fulham Palace-road at what is known as "Robin Hood-corner," and to contribute one half of the cost, estimated at 8,500*l.* Knightsbridge: The widening of the road (now from 46 ft. to 53 ft. wide) was ultimately agreed to by the Council at their meeting on July 29 last, upon Councillor Howell Williams's amendment, provided that the parish of St. George, Hanover-square, contribute one-fourth of the estimated cost of 32,067*l.* The leases of part of the scheduled property on the southern side, between Wilton-place and William-street, owned by the Ecclesiastical Commissioners, are about to fall in; for this land the Commissioners asked 21,892*l.* We may add that the Poplar District Board has expressed its willingness to contribute 10,000*l.* towards the estimated cost (33,500*l.*) of the Isle of Dogs scheme. The St. Pancras Vestry agreed to contribute one-fourth,—say 7,000*l.*—towards the widening from 33 ft. to 60 ft. of Fortess-road, with subsidiary improvements; and the Deptford improvement, previously scheduled by the late Metropolitan Board of Works in 1888, has been estimated to cost 62,000*l.*, towards which we understand, the Southwark and Deptford Tramways Company and the Greenwich District Board will contribute. The new thoroughfare would accommodate much of the traffic from Plumstead to London Bridge, and *pro tanto* relieve London-street, as also New Cross-road and Greenwich-road.

### Illustrations.

#### BRIDGE CHAPELS.

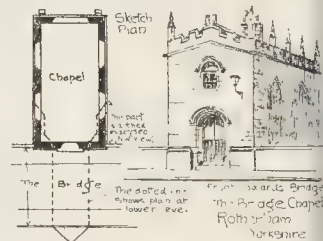
ATTENTION was recently drawn to the old Bridge Chapel at Wakefield, Yorkshire, undergoing for the second time a thorough restoration. This and the one on the bridge over the Don, at Rotherham, not far distant, are the two most perfect examples we have remaining. In Medieval times a large number of these bridge and wayside chapels existed in various parts of the country, but those now remaining, either as a whole or in part, would probably hardly reach a dozen in number. One of the most celebrated of them, now gone, was the chapel of St. Thomas à Beckett on Old London Bridge (shown in the views of London published in the *Builder*, May 10th, 1884, and January 7, 1888). Others existed at Rochester, Derby, York, Durham, Wallingford, Bridgnorth, and Exeter. There is a small building on the bridge at Bradford-on-Avon, Wilts (see *Builder*, August 20, 1887), but it seems doubtful whether it was ever used as a chapel; it probably occupies the site of a former structure of that kind. In 1882 an interesting paper on the subject of Bridge Chapels was read by Mr. S. W. Kershaw, F.S.A., before the St. Paul's Ecclesiological Society, which we printed in our issue of April 29th of that year.

Of the two examples which we illustrate today (see plate), that of St. Mary's, Wakefield, is by far the most elaborate in design. Not quite in the centre, "below bridge," is an island on which the chapel is built, the plan being so arranged below as to offer the least resistance to the stream (see dotted lines on plan). The extra width required for the chapel above is obtained by corbelling out on either side, which gives a total external width of about 20 ft. The total length is about 45 ft. The front towards the bridge is very elaborate, and is divided into five ogee-headed compartments, with buttresses between. Three of these, the centre and two ends, are doorways, the other two being panelled. Over this is a series of five panels

filled with sculpture representing the Annunciation, the Birth of Jesus, the Resurrection, the Ascension, and the Descent of the Holy Ghost on the Disciples. Surmounting the whole are battlements; and a bold group of pinnacles at each end of the front over the buttresses. Each side is lighted by three three-light windows, and the east end has a large one of five lights; all have rich Decorated tracery. A well-designed turret stands at the north-east angle, and contains the staircase which communicates with the roof and crypt. On the north, south, and east fronts is a panelled parapet, and there is a canopied niche over the east window. There was formerly a priest's house adjoining, but the last vestiges of it were removed in 1866.

In 1847 the chapel was restored—practically rebuilt—by the late Sir G. G. Scott. The original front was removed to the grounds of Kettlethorpe Park, a short distance south, where it is still to be seen. Unfortunately, Bath and Caen stone were used externally in the restoration, and the atmosphere of Wakefield has played havoc with the new work. Indeed, some of the detail is sharper in the original at Kettlethorpe than in the restored chapel, and its deplorable condition has rendered a second restoration necessary. The interior is in good repair, and is fitted up for service, being the only example that exists at the present time. The windows on the south and east are filled with stained glass.

Not far distant is the bridge chapel at Rotherham, also illustrated in the present number. Here, again, we find a small island, which has been utilised to some extent to form a foundation for the chapel. As at Wakefield, the upper portion is corbelled out on either side, the end against the bridge being carried by a half arch. The Rotherham example is much simpler in



design and is smaller in size, being a rectangle about 30 ft. by 14 ft. It is lighted by two windows on either side, a large one over the altar, and a smaller one over a door facing the bridge. An embattled parapet with pinnacles ran round the whole. The building is now used as a tobacconist's shop, and has been divided into two floors. All the tracery has disappeared from the windows, and the space walled up and pierced with small modern sash windows. In Mr. Guest's book on Rotherham an engraving is given of the chapel and bridge, with the tracery restored. Each of the side windows is shown there as of three lights, and the small one over the door of two lights. It seems a pity that this chapel cannot be restored and the window tracery replaced.

Next week we propose to give some sketches of the bridge chapel at St. Ives.

#### EXAMPLES OF BRASSES.

THE brass of Sir Nicholas Dagworth, Blickling, Norfolk, belongs to what is known as the camail period of armour. The knight's head is placed on the tilting helm, which is surmounted by the crest. The jupon, cut into a curious leaf pattern, is confined by the baldric, to which is attached the sword and dagger. The sword-hilt is of a curved pattern, and the upper portion of the scabbard is ornamented with a canopied detail, which is also to be seen at the extremity of it. The armour, which is ornamented, is very simple. Mail is seen above and below the knees, at the armpits, and over the instep. The mode of attaching the camail to the bascinet is not shown in this instance. The inscription, of which very little is now left, is in black letter with sprays of leaves placed between each word. On either side of the figure are placed shields of arms.

The brass of Sir William De Tendring, Stoke





## EXAMPLES OF BRASSES.—F



SIR WILLIAM DE TENDING, 1408, STOKE-BY-NAYLAND, SUFFOLK  
Length of Original 5 ft. 10 ins



SIMON DE WENSLAGH, 1360, STOKE-BY-NAYLAND, SUFFOLK  
Length of Original 5 ft. 10 ins



DESIGNED BY MR. A. OLIVER, A.R.I.B.A.



PHOTO LITHO SPRAGUE & CO 22 MARTIN LANE CANON - LONDON E.C.

SHIRE

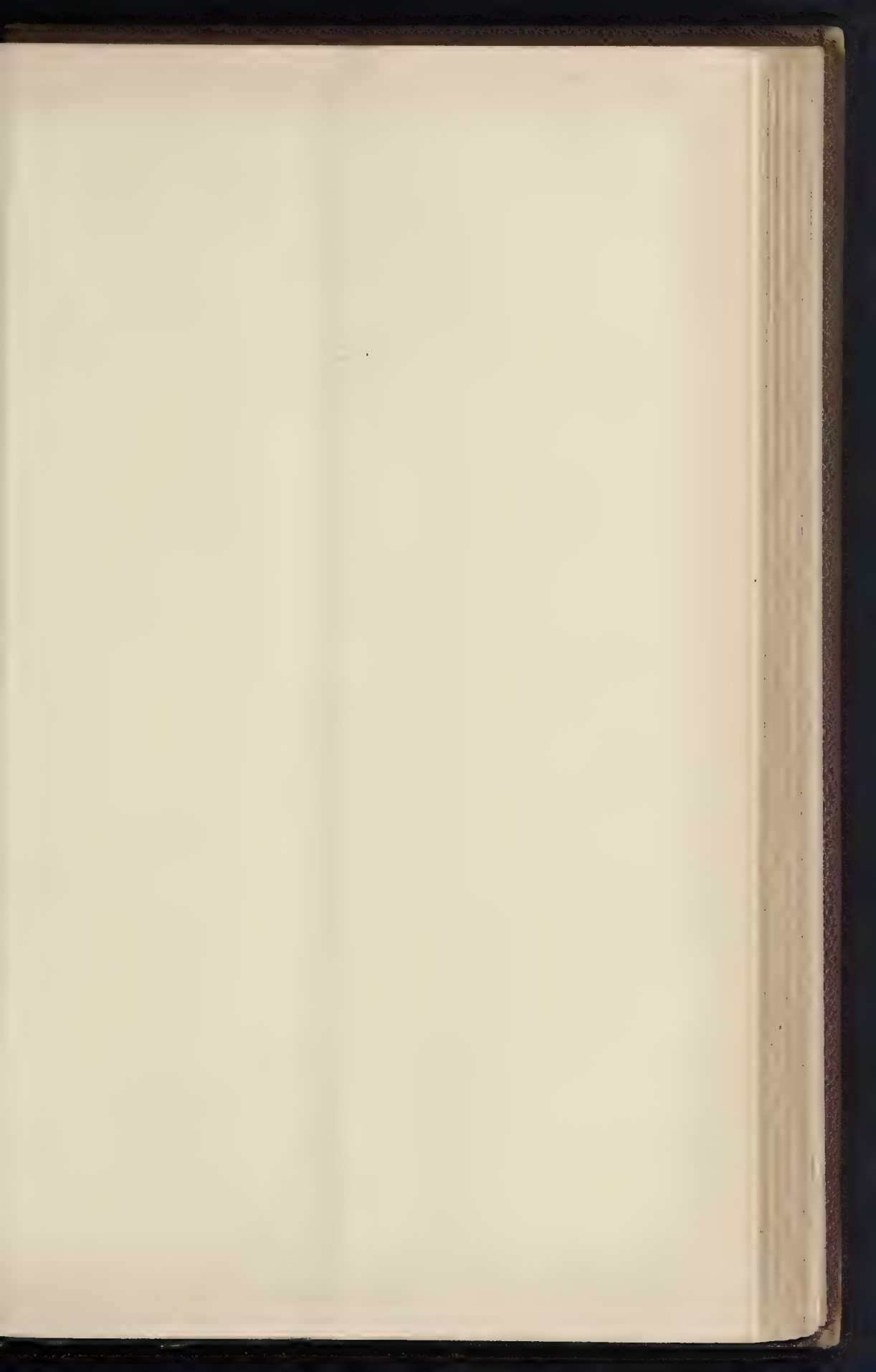
SIR NICHOLAS DAGWORTH, 1401, BLICKLING, NORFOLK.

(A MUTILATED MARGINAL INSCRIPTION OMITTED.)

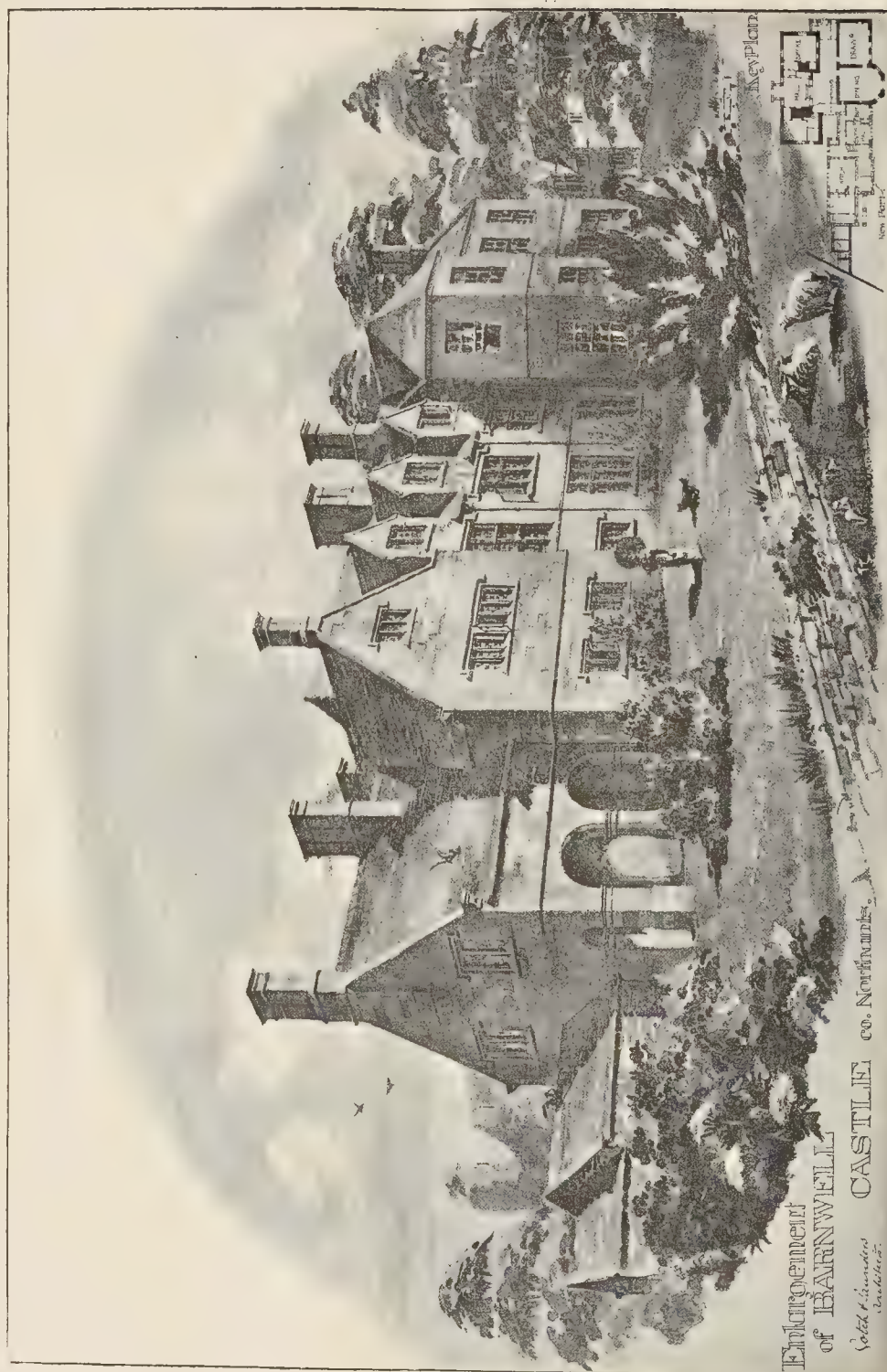
Length of Original 5ft. 8 in



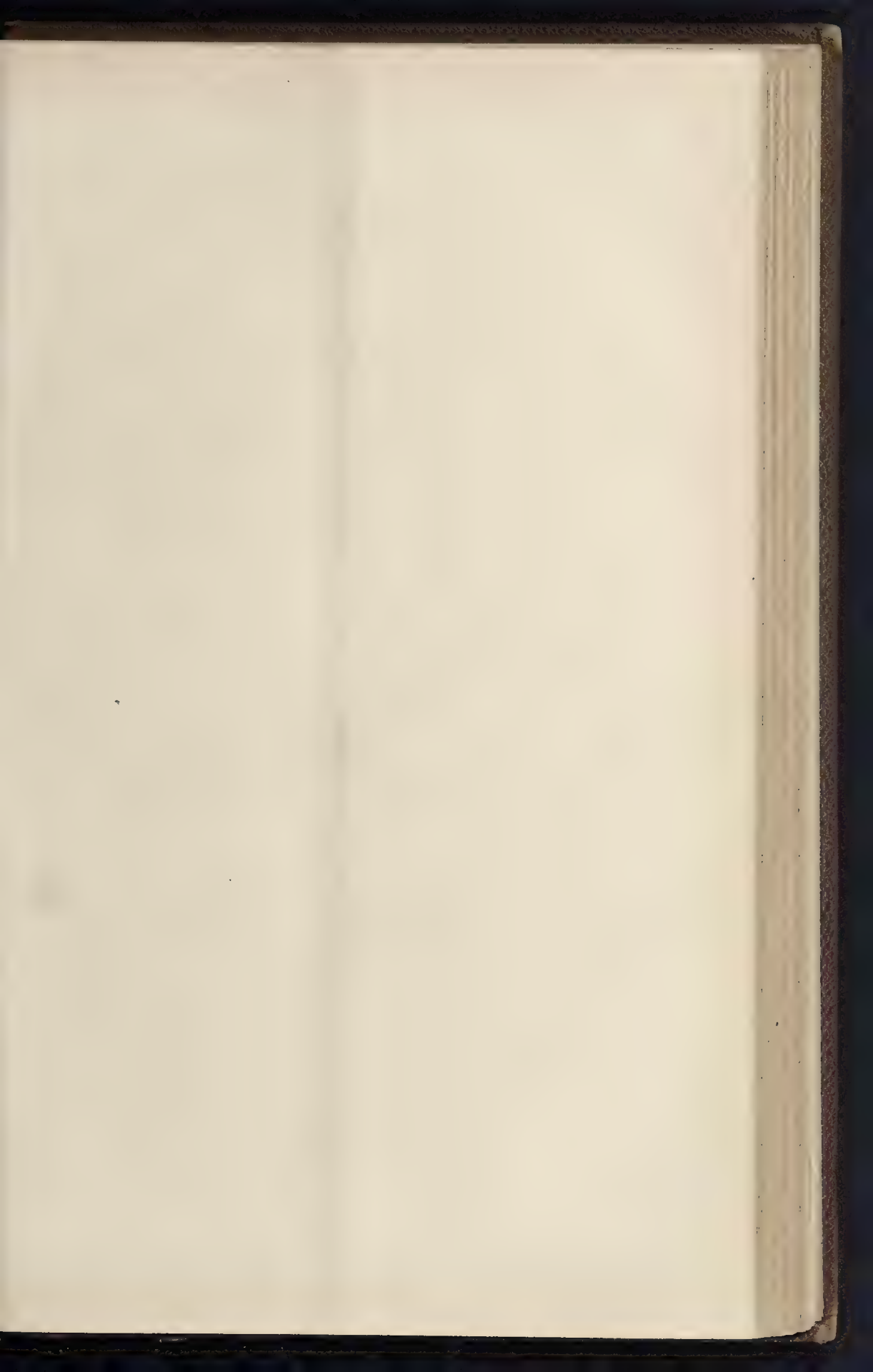




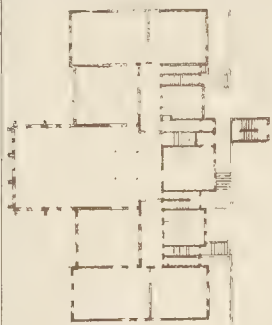
THE BUILDER, NOVEMBER 22, 1890.



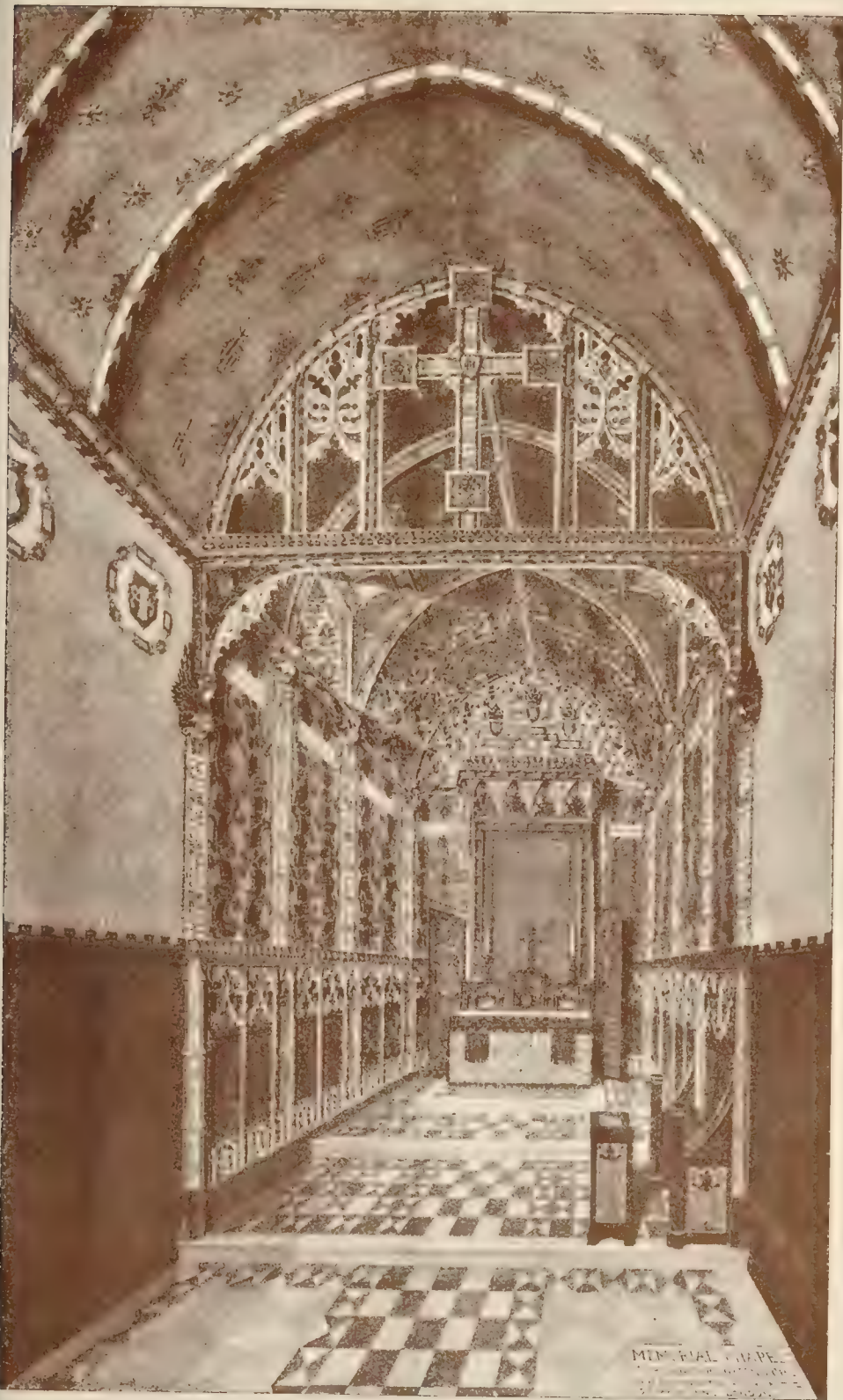




THE  
SECOND  
FLOOR  
PLAN  
OF  
THE  
NEW  
MUSEUM  
AND  
GALLERY  
AT  
THE  
SCIENCE  
MUSEUM,  
LONDON.











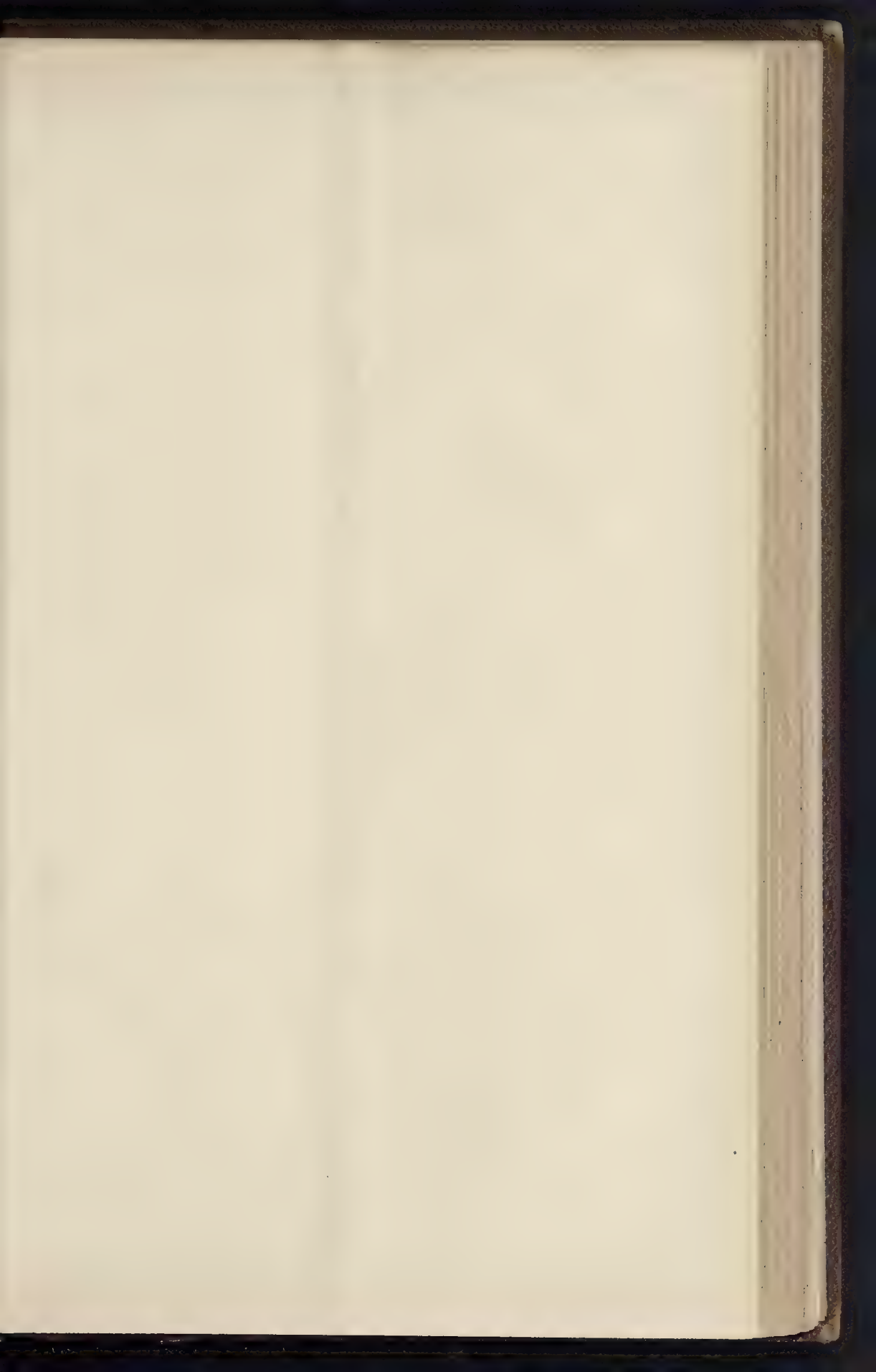


THE HILLCREST  
 OF STANFORD  
 AND HILLCREST CO. NORTHERN CALIF.

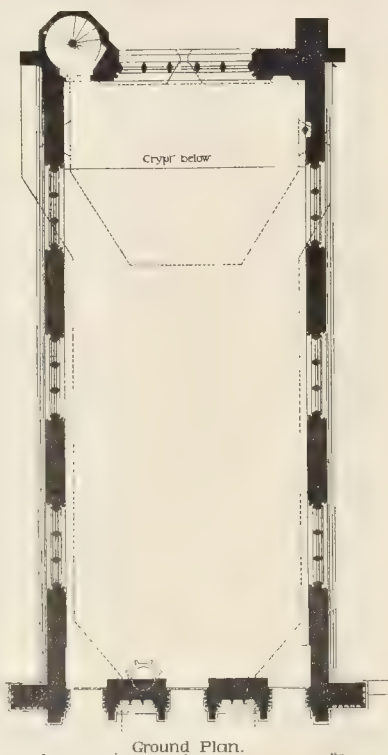
JOHN A. HILLCREST  
 ARCHT.







# The Ancient Bridge at Wakefield & Rotherham



Ground Plan.  
The Chapel, Wakefield Bridge.



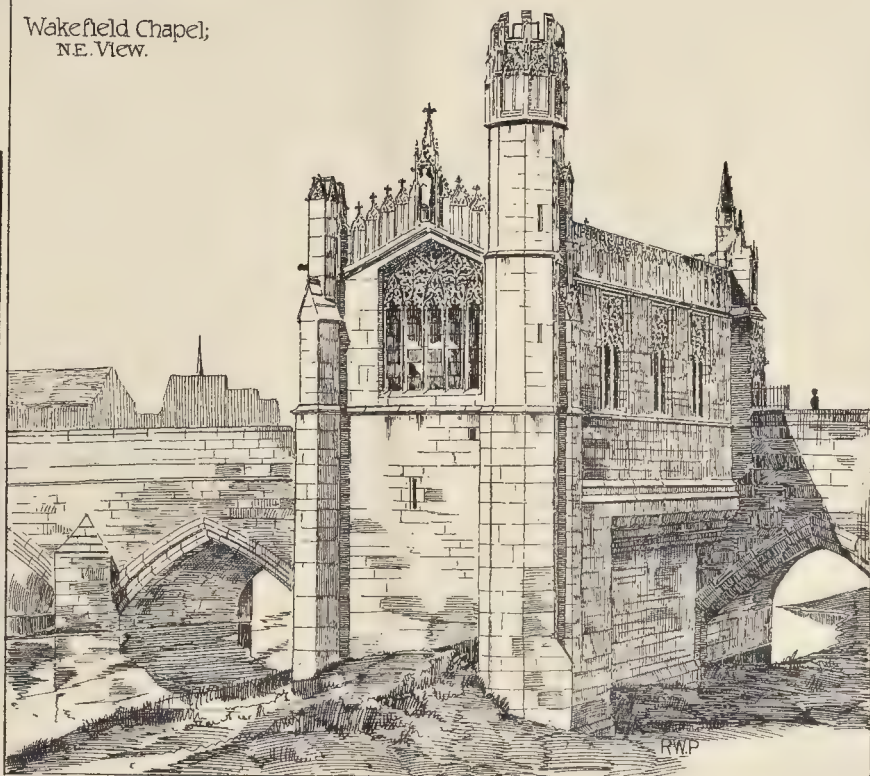
Rotherham Bridge





oels  
m.

Wakefield Chapel;  
N.E. View.



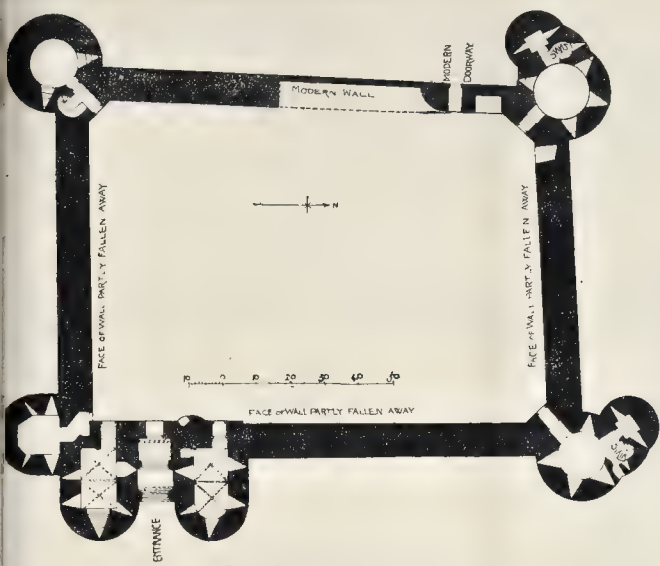
Chapel;  
front.

Wakefield Bridge.









Barnwell Castle: Ground Plan.

by-Nayland, Suffolk, presents some features not usually to be seen in the brasses of this type. The head, which is bare, is placed on the tilting helm, and a long beard falls over a kind of mail gorget. In the detail it is somewhat similar to that of Sir N. Dagworth, in the ornament on the gauntlets, the baldric, and in the sword-hilt and scabbard. Mail may be seen at the arm-pits and instep. The figure of the lion under the feet is different to that usually seen. The brass of Simon de Wenselagh, Wensley, Yorkshire, is of the kind known as Flemish. It bears a very strong resemblance in the detail to that of Abbot Delamere, St. Albans (see *Builder*, September 13). The head of the figure rests on a cushion supported by angels. The hands, contrary to the usual practice, are turned downwards, and above them is placed a chalice and paten. Below the feet are two dogs. The matrix of a marginal inscription is round the figure. An inscription, dated 1607, is placed over the head of the effigy.

A. O.

PREMIATED DESIGN FOR BOARD SCHOOL, HARRINGAY.

This design was awarded second place in the recent competition by Mr. E. R. Robson, the professional referee. The school was planned to accommodate 1,200 children, with a cookery class for girls, caretaker's house, and hall to seat 600 in addition. The materials proposed were red brick, with moulded brick strings, rough-cast in the gables, with plain tiled roofs. The whole scheme was to cost about 11,000*l*. The design is by Messrs. Mitchell & Butler, architects.

MEMORIAL CHAPEL, TRAFALGAR-ROAD, GREENWICH.

This chapel, which is nearly completed, is built of brick, with a wooden barrel-vault roof. It is lighted by a three-light window at the west end, and by a dormer in the chancel roof. The pavement is of black and white marble, with wood block flooring under chairs. The whole of the interior will be decorated. The work is being carried out by Messrs. Wheeler Bros., of Reading. The decoration is by Mr. H. A. Bernard Smith, of Lewisham-hill. Mr. A. H. Skipworth, of London, is the architect. The original drawing is exhibited in the Arts and Crafts Exhibition.

BARNWELL CASTLE.

THE present dwelling-house, which is now being enlarged, belongs to the Duke of Buccleuch and Queensberry. It was built early in the seventeenth century out of the stones of

a thirteenth-century castle, and some fifty yards away from that dismantled structure. Some time during last century the house was considerably enlarged by the addition of a drawing and dining-room, with bedrooms over, but the accommodation for servants was left quite inadequate. The object of the present enlargement is to provide such accommodation, and the new wing contains the kitchen and kitchen offices, servants' hall, and butler's pantry, with bedrooms over. The style of the new work is in conformity with the seventeenth-century portions, although the view we publish only shows the plain eighteenth-century part of the old work. The walling is carried out in local stone, chiefly obtained from old buildings that have been pulled down, and the dressed stone is from the Weldon quarries. Since the accompanying drawing was made, it has been decided to add a story for the nurseries over the end of the new wing, while at the other end of the building a new boudoir with bedrooms over it has also been added.

The contractor is Mr. George Henson, of Wellingborough, who is carrying out the works from the designs of Mr. J. A. Gotch, F.R.I.B.A., and Mr. Chas. Saunders, of Kettering.

The remains of the ancient castle are visible in the illustration, as also are the seventeenth-century stable-buildings to the right. There is very little known of the history of the castle, except that it was built by one answering to the romantic name of Berenger le Moine. It was not a large place, but the remains are very considerable, and the ground-plan, which is given in the annexed cut, is tolerably complete. Fireplaces and windows of upper floors can also be seen from below, but they are inaccessible.

BRIGSTOCK MANOR HOUSE, NORTHAMPTONSHIRE.

This house has recently been enlarged by the addition of a servants' wing. It was formerly used as a farm house, in which capacity full advantage could not be taken either of its large rooms or of its dignified character. It was at one time the residence of the Montagues, and within its walls was born the founder of the dual house of Montagu of Boughton.\* Parts of it date from the fifteenth century, and other parts from early in the seventeenth. But although it was a house not unworthy of being a manor-house, it was badly supplied with servants' accommodation,—hence the decision to add a new wing. This includes servants' hall, butler's pantry, brushing-rooms and lamp-room, with bedrooms over them. To gain access from the old part to the new, a one-story

\* From them it has descended, along with their other Northamptonshire estates, to the Duke of Buccleuch and Queensberry.

corridor was thrown out in the angle where the new and old joined.

The walls are built of local stone, with Weldon stone dressings, and the roofs are covered with Brossley tiles.

The contractor was Mr. George Henson, of Wellingborough, who carried out the work from the designs and under the superintendence of Messrs. J. A. Gotch, F.R.I.B.A., and Charles Saunders, of Kettering.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday afternoon, Sir John Lubbock in the chair.

Waterloo Park.—The Parks and Open Spaces Committee presented the following report as to Waterloo Park, Highbury:—

"We have had before us the question of Waterloo Park, which, as the Council is aware, was presented to the public by Sir Sydney Waterlow. It is a property estimated to be worth about 50,000*l*., and we consider that, both in deference to the wishes of Sir Sydney, who so generously made the gift, and to the public to whom it was given, the Council should place the park in such a condition as to render it suitable for the public use. At present it is enclosed by a high wall, which excludes the public from any view of it, and we may, perhaps, add that a great many people who have no time to visit parks obtain pleasure by being able to see them in passing if the parks are enclosed with an open fence. There are other necessary works, such as the provision of a water supply, the cleaning out and rendering safe of the lake and a pond, the fencing in of shrubberies, the raising of the portion of the boundary-wall which adjoins certain houses, the repair of the green-houses, the provision of public conveniences, seats, and the renovation of the Superintendent's lodge, which is in a somewhat dilapidated condition, although otherwise a slightly building. We are endeavouring to make arrangements with the owner of Fairseat House and grounds, which are held on lease, so that the Council may be enabled to remove it altogether or to let it for other purposes than that of a private dwelling, for which it does not appear to be in demand. There are, however, two other houses on the freehold portion of the park, one, Hertford House, which is neither useful nor ornamental, nor possessed of any historical interest; and the other, Lauderdale House, which is possessed of a certain historical interest. We propose that Hertford House shall be at once pulled down, and as regards Lauderdale House, that it should be retained, if it be possible to repair it at a moderate cost. In any case, as regards the old garden adjoining it, which is laid out in the style of the seventeenth century, we propose to restore it with its terraces at a cost of 320*l*. The expenditure which we have to ask the Council to incur is necessarily a large one, but we are of opinion that the Council, having accepted the park, is morally bound to put it into such a condition as to be a credit alike to the Council and the donor.

We may add that there is a proposal from the Vestries of St. Pancras and Islington that, in erecting the open fence next Dartmouth Park-hill, a portion of the park should be given up for the widening of the road, which is at present very narrow. We propose to report upon this at a future date. In the meantime, the recommendation which we have to submit is as follows:

"That, subject to an estimate being submitted to it by the Finance Committee as required by the statute, the Council do authorise an expenditure on capital account of 9,485*l*. for alterations at Waterloo-park; the works comprising—

Construction of paths .....	£3,560
Laying water supply .....	350
Cleaning out lake and pond and making them safe .....	525
Fencing shrubberies .....	440
Restoring Lauderdale-house terrace .....	320
Erecting boundary fencing in place of close brick wall .....	2,000
Raising north-west boundary wall next backs of houses .....	225
Renovating greenhouses .....	675
Erecting public conveniences for both sexes .....	650
Improving shrubberies .....	300
Pulling down Hertford-house .....	175
Renovating Cemetery Lodge .....	150
Purchasing 100 seats .....	225
	£9,485 "

This report led to a long discussion, which was raised on an amendment, moved by Mr. Deachoroff, to reduce the amount of the proposed expenditure by 4,045*l*., by omitting the sums of 3,560*l*. for making paths, 320*l*. for restoring Lauderdale House-terrace, and 175*l*. for pulling down Hertford House. The opinion was expressed that the amount proposed to be expended on paths and roads was excessive, and Colonel Edis and other members of the Council protested against the conversion of Waterloo-park into any such Cockneyified specimen of



"landscape gardening" as were to be witnessed, they said, in Dulwich-park and Vauxhall-park. On a show of hands, the amendment was carried by 36 votes to 30, and on a division by a larger majority, 47 to 38. On the amendment being put as a substantive motion, the members of the Committee asked that the whole question might be referred back to them for consideration, and this course was agreed to.

*The Report of the Special Committee on Contracts.*—On this report\* being called,

Mr. Arthur Arnold moved that recommendation *a* be referred to the General Purposes Committee for examination and report. He contended that such clauses and restrictions as the Council had inserted in its conditions of contract had deterred respectable and responsible contractors from tendering.

Mr. Howell Williams seconded the amendment, but the recommendations of the Committee were supported by Mr. Stevens, Mr. Roberts (both builders), Mr. Burns, and Col. Edis, who, as an architect, said it was not only desirable, but absolutely necessary, in the case of special work, to allow subletting. Mr. W. Eneas Smith, the Chairman of the Special Committee, said that the adoption of recommendation *a* would only be a reversion to the old practice of the late Metropolitan Board of Works, who inserted such a condition into their contracts for years.

On being put to the vote by show of hands, the amendment was lost by a large majority. A division not being demanded, recommendation *a*, and the other recommendations of the Committee, were agreed to.

*Tenders for Works at Abbey Mills Pumping Station.*—The report of the Main Drainage Committee contained the following paragraph:—

"The Council on the 11th instant referred to your Committee the tenders which had been received for the execution of certain alterations and additions to the boiler-house, &c., at the Abbey-mills Pumping station. Only two tenders had been sent in, namely, from Mr. William Neil, £6,898, 19s. 2d., and from Messrs. J. Mowlem & Co., £10,934. Under these circumstances, and looking to the great disparity in the two amounts, your Committee have come to the conclusion that the best course will be to re-advertise the work. They are also of opinion that in doing this bills of quantities should be supplied by the Council. They recommend:—

"That an advertisement be again issued, inviting tenders upon proper bills of quantities."

This was agreed to.

*The Water Supply Question.*—The Special Committee on Water Supply and Markets brought up the following report:—

"We have had before us a copy of the Parliamentary notice issued on behalf of delegates of the Vestries and District Boards as to a Bill relative to the London Water Supply. The main objects of this Bill are to empower either the Council or a specially-constituted Water Trust to acquire the undertakings of the eight water companies, on terms to be settled by agreement or by compulsion; and also to provide supplemental or alternative sources of supply. In view of the introduction of this Bill and of the possibility that it may be dealt with by a Parliamentary Committee in the course of next session, it is desirable that the Council should determine the course to be taken with regard to it. By the 38th section of its General Powers Act of last session the Council was authorised to prosecute and conduct inquiries and negotiations relating to the supply of water, or companies supplying water, in or near London; and the Council empowered us to enter upon such inquiries and negotiations. We at first considered that the best course would be to hold an inquiry, at which evidence could be taken, and with this view we put ourselves into communication with the eight water companies. The companies, however, were unanimous in declining to submit evidence at such inquiry, and, as it appears to us to be essential in an inquiry of this nature that all sides should be heard, and that the investigation should be of an exhaustive nature, we have come to the conclusion that, in the absence of the co-operation of the water companies, it is not desirable to enter upon an inquiry in this form.

The Council cannot promote any Parliamentary Bills relating to the water supply, but can oppose Bills in Parliament affecting the County of London, and we have come to the conclusion that the most desirable course for the Council to take in connexion with the authorised inquiries is to obtain

\* Printed *in extenso* in last week's *Builder*, p. 385.  
+ Recommendation *a* was as follows:— "That the sub-contracting be added to the clause, now inserted in the Council's contracts, with reference to subletting or allow the contractor to sublet such special portions of the work as would not be produced or carried out by him in the ordinary course of his business."

information and prepare evidence, with a view to its being submitted to any Parliamentary Committee dealing with the subject.

In connexion with this subject we may refer to the report recently issued by the County Purposes Committee of the Corporation of London relative to the inquiry on the subject of water supply which has been held by that Committee on behalf of the Corporation. It appears to us that although much valuable information was submitted to the Committee, the inquiry was open to the objection that it was an *ex parte* inquiry, and that the water companies submitted no evidence. The conclusion came to by the Corporation Committee was that, as the eight water companies who supply London also supply large areas outside London, Parliament should create a water authority consisting of representatives of the governing bodies over the entire area of the watersheds of the Thames and Lea, and that such authority should govern the watershed and manage the supply. The Committee also pointed out that the prosecution of a Bill relating to the London water supply must fall upon the Corporation, as at the present time no other public body has power to incur the necessary expenditure. Should the Corporation introduce any such Bill it will be necessary that the Council should be prepared to submit evidence upon it.

We do not propose at the present time to enter upon the merits of the proposals made either by the delegates of the Vestries and District Boards or by the Corporation, as the Bills embodying these proposals are not yet before us, but it is obvious that the creation of a water authority over such an extensive area as that indicated must raise very serious questions. In recent legislation relating to the water supplies of provincial cities, Parliament has invariably given the Corporation of the city to be supplied the sole control of the water undertaking, providing, however, for the supply by the Corporation of a sufficient water-supply to the surrounding districts.

Whilst holding these views we feel that the Council and the Corporation are at one in desiring to place the supply of water to London in public hands, and we are now in communication with the Corporation on the subject. We recommend:—

"That it be referred to the Parliamentary Committee to take, in conjunction with this Committee, subject to any necessary resolutions under the Act relating thereto, the necessary steps to enable the Council to submit to Parliament its views on any Bills dealing with the water supply of London which may be introduced during the ensuing session."

We also report that we have addressed a letter to the eight water companies supplying London with water, asking each of them to be good enough to permit Mr. Binnie, the Engineer of the Council, to examine the works of the company. To this letter seven out of the eight companies have replied, and the Chelsea, Grand Junction, and West Middlesex Water Companies have given the necessary permission to inspect their works."

The recommendation was agreed to.

*The Proposal to take Pupils in the Offices of the Council.*—The debate on Mr. Breerton's motion (see last week's *Builder*, p. 385 *ante*) was resumed and concluded, and, after speeches in opposition by Mr. Haggis (the Deputy Chairman) and Mr. Fardell, the motion was negatived by a large majority.

After transacting some other business the Council adjourned.

## ARCHITECTURAL SOCIETIES.

**BIRMINGHAM ARCHITECTURAL ASSOCIATION.**—The annual *conversations* of this Association was held at the Edgbaston Assembly Rooms, on the evening of the 12th inst.; a very enjoyable evening was spent. There were about 300 members and guests present, and the proceedings opened with a reception by the President, followed by a concert and dancing, which was continued to a late hour. A fine collection of drawings was exhibited, those chiefly attracting attention among them being the pen-and-ink drawings of Mr. Herbert Railton (kindly lent by Messrs. Virtue of London) and Mr. Raftles Davison, and the drawings and sketches lent by Messrs. Millard, Horsley, Aston Webb, Davies, May, Sedding, Edis, Bidlake, Bewlay, and Mitchell; the cartoons for stained-glass work, lent by Messrs. Holiday, Ward & Hughes, and Hardman & Co., and the pictures lent by Mr. E. R. Taylor and Mr. J. Pratt, also excited considerable interest. There was also exhibited in the rooms a very complete and interesting collection of English and foreign marbles lent by Mr. J. Ward, and the drawing-rooms were, by the kindness of Messrs. Norton & Co., of Birmingham, tastefully furnished and decorated under the direct superintendence of Mr. Bardell.

**LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.**—The first meeting of the fifteenth

session of this society was held on Monday evening last, in the society's rooms, Infirmary-street, Leeds, when the opening address was delivered by Mr. W. H. Thorp, F.R.I.B.A. At the outset he gave a brief history of the institution. He said that, in common with other organisations of a similar character, it had had varying seasons of light and shade, had been largely dependent for its existence and success on the continued efforts of a limited few, but had always shown signs of vitality, even at times when there had been cause for some little discouragement. One important event which must materially affect the welfare of the society had transpired since the concluding meeting of their last session. After somewhat prolonged negotiations and interchange of correspondence, the alliance of the Yorkshire society with the Royal Institute of British Architects was now an accomplished fact. That the alliance would prove of benefit both to the parent institution and its branches in the provinces he thought there could be but little doubt. After referring to the advantages they would derive from the amalgamation, Mr. Thorp, speaking of examinations and diplomas, said he looked forward to a time, and that not very far distant, when the architect whose reputation had not been made prior to these more enlightened days, and who failed to possess himself of the necessary guarantees of ability, would find himself at no little disadvantage as compared with his fellows. Valuable appointments of a public nature were usually only obtained by those possessing the highest qualifications, whether they were representatives of the scholastic, medical, or legal professions; and, in like manner, the architect of the future who, in addition to his known capacity for work, was the owner of the Institute diploma, was more likely to be preferred than his less fortunate fellow-practitioner who was without.

**SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.**—The monthly meeting of this Society was held at the School of Art, on Tuesday evening last. Mr. F. Fowler presided, and there was a good attendance of members, including Messrs. C. J. Innocent, J. B. Mitchell Withers, E. M. Gibbs, W. F. Hemmell, W. C. Fenton, E. Macdougall, J. E. Benton, J. Smith, Theo. Winder, C. F. Wike (Borough Surveyor), H. W. Lockwood, and others. Mr. J. R. Wigfull read a paper of a technical character, illustrated by well-executed diagrams, on domestic sanitary fittings. The subject was, he observed, one of special importance to Sheffield architects now that the Town Council were contemplating the system of sewage disposal by water-carriage. The new by-laws would tend, moreover, to improve sanitary work in the homes of all classes of the community. The various kinds of water-closet apparatus were noticed, and the different ways of constructing and jointing soil-pipes described, with the systems of ventilation, sewer disconnection, &c. The lecturer also noticed, as a probably useful means towards this end, the glass-lined pipes of Messrs. Dan Rylands & Co., specimens of which, lent by the agent, Mr. Donovan, lay on the table. A lengthy discussion of a practical character took place, in which Messrs. J. Smith, H. W. Lockwood, W. C. Fenton, E. Macdougall, and the Borough Surveyor, with others, took part; and, on the motion of Mr. J. B. Mitchell Withers, seconded by Mr. C. Hadfield, a hearty vote of thanks was awarded to Mr. Wigfull for his paper.

**GLASGOW ARCHITECTURAL ASSOCIATION.**—The usual monthly meeting of this Association was held on the 4th inst., when a paper on "Greek Architecture—Late Period" was read by Mr. R. J. Gildard. The President, Mr. William J. Anderson, occupied the chair. Mention was made of the reproduction of various types of Athenian architecture to be seen in Glasgow, such as the Gao, Royal Bank, Waterloo Rooms, &c. Mr. David Andrew opened a discussion which followed, at the close of which the usual vote of thanks was passed to the essayist.

**ARCHITECTURAL SECTION OF THE PHILOSOPHICAL SOCIETY OF GLASGOW.**—The architectural branch of the Glasgow Philosophical Society commenced the winter session on the 17th, in the rooms, Bath-street, when the President, Mr. James Thomson, F.R.I.B.A., delivered the inaugural address, in the course of which he alluded to the erection of picture-galleries and museums in large cities, and while advocating the maintenance of these institutions, he thought that more might be done in the



ection of providing "People's Palaces" and recreation halls. As to the housing of the working classes, he considered that a great deal had been done in that direction, but what was wanted seemed to be better accommodation for the lower orders, at a rental which would not be prohibitory. He concluded with reference to the late Mr. John Carrick, City architect of Glasgow. On the motion of Mr. Campbell Douglass, seconded by Mr. Gildard, vote of thanks was accorded to the President of his address.

Correspondence.

To the Editor of THE BUILDER.

ISLINGTON BATHS COMPETITION.

SIR,—In your article upon the premiated designs above, in your issue of to-day's date, you are commenting favourably upon my plans, drawing attention to a discrepancy that has been discovered between several of the competitors between the figured plan and the drawing of my second-class bath. It is an error admits of a simple, and, I think, acceptable explanation. In the preparation of my plans, I myself pencilled—in all notes and dimensions upon the drawings, but by some means or other the assistant who generally has the printing to my plans mistook the 2 of the ft. for a 3, making the figured width 37, instead of what it should have been, 27 ft. In the report, however, accompanying my design the dimensions are correctly given, viz., 72 ft. by 27 ft. This fact, on being conveyed upon the drawings, the error was added to a width of 27 ft., precludes the possibility, I think, of any imputation of unfairness on my part in the matter.

Your criticism of my scheme generally I consider to be just, and even complimentary. I would, however, like to correct you upon one portion of it. The ironing-room has been considerably altered in my revised plans. I think, on looking over the original ground-plan and the revised edition of the same (which I now send for your inspection), you will admit that this is not quite correct. In the plan, it is true that, at the desire of my Commissioners, I have incorporated a suggestion of the Messrs. "viz., to dispense with one of the pay-boxes. To do this I had but to transfer the entrance to the public laundry in the Stanmore-street to the other side of the women's pay-box in the Caledonian-road, displacing the ironing-room, longitudinally, to the extent of the space vacated by the displaced pay-box and adjacent waiting and cloak-rooms transferred to the Caledonian-road front. I think, therefore, I may justly maintain that my plans have been altered to no considerable extent.

It should, I think, be borne in mind, in criticising me for the buildings in question, that the site was adequate for the proper accommodation required by the Commissioners; and that therefore some compromise had to be made by the several competitors in attempting to solve this problem. I myself did this at the expense of reducing the size of my second-class bath, and I was enabled thereby properly provide on the ground-floor every part of the establishment that should be so accommodated. The provision of slippers-baths and the public laundry was no moderate in its requirement to admit of no reduction in this part of the establishment, and I was of opinion that one of the ironing-baths might better bear being reduced in size. A clause of the "conditions" issued to the competitors clearly gave them the right of effecting any compromise of the conditions that might suggest itself to them. This clause was as follows: "It is suggested that the following accommodation should be provided, but the architect is at liberty to vary and adapt his plan and design to suit, as he may consider more suitable accommodation."

This explanation is, I think, due to myself, and I hope you will kindly insert it in your next issue.

A. HESKELL TILTMAN.

November 15, 1890.

\* We should say that the portion of the plan referred to above had been "considerably altered," and we did not attach any blame to the designer for doing so.

THE PAINTING OF ASPHALTE.

SIR,—Will you allow me by means of this letter to obtain the assistance of those of your readers who are competent to give it under the following circumstances?—

I am the possessor of an asphalt tennis-court in an open. When first laid, seven or eight years ago, it was of the usual dark slate-colour, very pleasant to play upon, but got rapidly very much lighter by the bleaching action of the elements.

This interfered so much with the sight of the ball, which soon became soiled and grey in London, that I cast about for some means of restoring the original colour, but without success.

None of the Asphalte Companies could help me at all, but at last a chemical friend suggested a solution of pitch in naphtha.

I have tried this, but it will not do. It is very difficult to put on evenly because the naphtha evaporates so rapidly, and it thus makes a streaky job, and soon wears off.

I dare say others have the same trouble, and if anyone can tell me of a suitable painting material, I shall gladly make it public.

The asphalters people say that it must not contain either oil or turpentine, as these would injure the asphalt. (My court is laid with "Val de Travers" mastic.)

The paint must not be "shiny," but "flat"; it must not make the surface slippery, and it ought to last in good condition for several years.

I think the best colour would be a darkish neutral tint, or the colour of asphalt when just wet all over.

I am having a number of 4 in. squares of asphalt made on which I can try the material in case any makers send me samples of what they recommend.

I shall be much obliged for information.

J. M.

CEMENT TESTS.

SIR,—In reference to the letters of Mr. Faija and Mr. Roehching, there is no reason why we should simply adopt bodily the German standard tests, but I think that a standard set should be drawn up for this country. There is not the slightest necessity to invoke Government interference. We have two powerful societies, the Institution of Civil Engineers and the Institute of British Architects, perfectly capable and fitted to deal with the whole question.

Let these two societies appoint a joint committee to draw up such a set of tests,—of course, after due consultation with the great firms of makers of cement; there is, I feel sure, no doubt but that such a committee could draw up most satisfactory regulations; and there is equally little doubt that if such a set of regulations were drawn up, very few engineers or architects would fail to adopt them; we should thus put an end to the often meaningless and contradictory tests now too frequently inserted in specifications.

I have no desire to make them compulsory, because I feel sure that common sense would be quite sufficient inducement for their general adoption.

J. HUDSON BEARE.

Engineering Laboratory, University College, London, W.C.

DEATH TO (NOT IN) THE VENTILATOR.

SIR,—The letters of Mr. Buchan and others in your issue raise a curious point with regard to soil-pipe ventilation. Many eminent sanitarians, including Mr. Buchan, recommend the use of cowls on soil-pipes. I am now puzzled to know why, as Mr. Buchan informs us that such cowls are intended not only to extract foul air, but to "let air down," why, then, not leave the soil-pipe open? We all know an open pipe is the most powerful extractor by the wind's action, and it is obvious it can "let plenty of air down." Why, then, use a cowl? Surely not simply to keep dead leaves out? It is rather too bad of Mr. Buchan, after being paid for many soil-pipe ventilators, to now show his customers that they could have done as well with no cowls at all. If we still care to follow Mr. Buchan's precepts, let us evict "Death from the ventilator" by removing the roof from over his head; and henceforward when we buy cowls get a proper warranty with each, so that we can take our choice out of up-draught, down-draught, or "patent combination up-and-down-draught" cowls.

J. F. SIMMONS.

Liverpool, November 17, 1890.

BRICK-BURNING NUISANCE.

SIR,—I note in your current issue that you draw attention to the fact that Dr. Dudfield confirms your opinion as to the cause of smells complained of.

It has always puzzled me why there should be so much doubt and delay about the matter. It is perfectly obvious to anyone who understands the system pursued in and around London that a very serious nuisance exists.

How is it possible that animal and vegetable refuse, in all stages of putridity, together with all kinds of indescribable filth, can be burned slowly, at a low heat, and the fumes openly diffused into the atmosphere without creating a great and dangerous nuisance? It is not a question of distance, for according to the state of the atmosphere and wind, the fumes will travel yards or miles accordingly.

I have detected the fumes of a brick clamp when at least three miles away. The clamp bricks, or London stock, has been done for some time on the ground of the tendency to use a better brick, and if the by-law referred to is rigidly enforced (as it should be), there is an absolute end to the clamp system in all places where such a regulation exists.

This fact seems serious at first sight, and will

doubtless put the brickmakers to the expense of erecting kilns, and burning the bricks with coal.

The bricks can be made either by hand or machine, and, if properly arranged, a good hard, kiln-burnt brick can be produced (obviating all the nuisance complained of) at a price as low, or lower, than those now produced by the clamp system.

JOS. JOPLING.

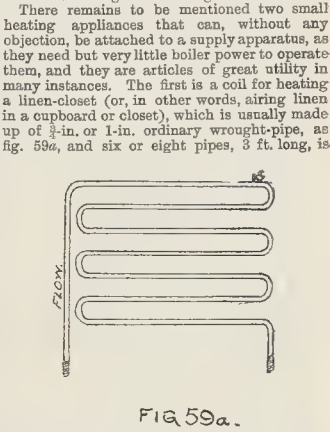
The Student's Column.

HOT-WATER SUPPLY FOR BATHS, LAVATORIES, &c.—XXI.

COILS AND COIL SERVICES (continued).

AN example of a case in which coils were attached to a supply apparatus, and to which no objection could be raised, was in a residence only occupied during the summer months; in this case the coils did not come into use during the occupation, so that the supply of water for domestic purposes was not interfered with, but when the house was left in charge of two servants all the winter very little hot water was required to be drawn off, and the coils had practically the full benefit of the fire. There was one coil placed in each of five bedrooms for the purpose of keeping them aired, which they very effectually did. In an instance such as this, and whenever it is at all possible, it is best to take a distinct service to the coils, not in any way connected with the flow and return of the supply apparatus, as this in the majority of cases will save putting stop-cocks in the flow-pipe to divert the current; whereas if two distinct services are taken from the boiler they both start about equally, and should the coil service rob the supply then there is no objection to putting a stop-cock in this (coil) service, to check, adjust, or stop the circulation in this direction. If a distinct flow and return is not practicable, perhaps the flow-pipe can be so run, and the return branched into the other return, but in either case it is desirable to have stop-cocks in both pipes to totally prevent circulation, and by this means the coils and coil services can be emptied (by a cock provided for the purpose) in the summer months, to save the extensive rusting that would go on.

There remains to be mentioned two small heating appliances that can, without any objection, be attached to a supply apparatus, as they need but very little boiler power to operate them, and they are articles of great utility in many instances. The first is a coil for heating a linen-closet (or, in other words, airing linen in a cupboard or closet), which is usually made up of 3-in. or 1-in. ordinary wrought-pipe, as fig. 59a, and six or eight pipes, 3 ft. long, is



sufficient for a large-sized cupboard, say 9 ft high, 6 ft. broad, and 4 ft. deep, and this coil does not particularly need any stop-cocks, as it is generally used all the year round.

The other appliance to be mentioned is a towel-rail made of tube (decorated in colours or nickel-plated), as fig. 59b. This serves the purpose of drying and airing towels, and if it is severe weather the warmth both to the towels and in the dressing or bath room is agreeable. This does not need stop-cocks, unless desired.

One very essential feature in any description of coil or radiator is an air-cock or tube for giving free escape to the air with which the apparatus is charged before it is filled with water, and also to discharge the air that is perpetually accumulating in every description of hot-water apparatus. These air-vents require to be fixed at the highest point on every coil, as air being so much lighter than water is



always to be found in the extreme highest positions.

The objection urged against an air cock is, that it wants regular attention (every few

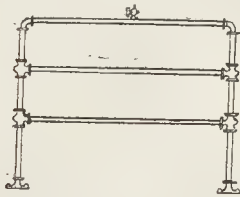


FIG 59b.

days at the least) which makes it unsuited for domestic purposes, and the remedy for this is to have an air-pipe, which, being open at the end, gives free discharge to the air as fast as it accumulates, and requires no attention; but an air-pipe is not always convenient, as, if there is a coil situated on the ground-floor, and the general apparatus terminates at the top of the house, then the air-pipe must be carried up to the top also, or it will overflow; it is, in fact, a secondary expansion-pipe. If air-pipes are used, these require to be just as many as air-cocks, but one air-pipe may be branched into another, but on no account must an air-pipe descend anywhere; in fact, they should not be carried horizontally, but ascending in a greater or less degree everywhere from beginning to end.

If a single coil is attached to a supply apparatus upon the tank principle it can either be connected to the flow pipe wholly or to the flow and return, as already explained; but with an apparatus upon the cylinder system we are better situated as regards this as we can connect it to the flow (secondary), or flow and return (secondary), or to the return only (secondary); this latter arrangement being the best by far, and which is not applicable with the tank system, as in this latter case the return takes a great time in getting hot, and when it is so it is continually being cooled down whenever a tap is opened and cold water enters the tank.

In connecting a coil to the secondary return of a cylinder apparatus we gain an advantage in only using water that has practically done its work, it having passed all the draw-off services and only having to pass through the coil on its way back into the cylinder; this is worth every consideration, as if a hot-water apparatus is designed to supply hot water there should be no obstacles or impediments placed in the way of its doing the work thoroughly, and to place a coil between two draw-off services means, as a matter of course, that the service nearest the boiler will have hot water some time before the one the further side, and if this one on the further side is of the least importance the coil will prove a source of annoyance to this extent. If the coil is placed in the return, the whole of the return water (which in a cylinder apparatus is very hot) can be made to pass through it, but a means of cutting it out must be provided for the hot weather.

In many of our suburban residences, it occurs that the kitchen is on the same floor as the entrance hall, and it is desired to place a radiator in this hall (one of the most efficient places for such a thing) with a view to warm some of the cold air that is perpetually pouring in here. A difficulty arises in the fact that if we place the radiator on the floor it will be below the boiler, a difficulty commonly supposed to be insurmountable, but such is not exactly the case, for we have already shown that in the usual way a pipe may descend and ascend (dip) to a certain extent, and it is so in this case.

It is not within the province of these papers to deal with the theory that supports this suggestion, especially as the subject of heating by here, but in practice it will be found that this arrangement is permissible, and will give fairly good results, sufficient to prevent its being deemed a non-success.

It is necessary to effect this that the general

apparatus extend up two or three floors, as usual, in which case it may be connected up as

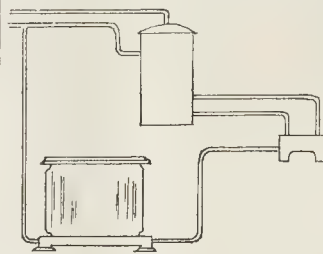


FIG 59c.

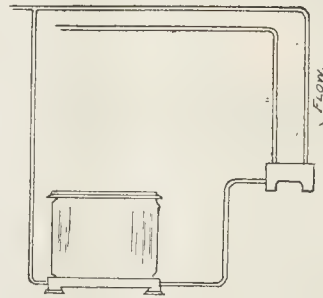


FIG 59d.

at fig. 59c or fig. 59d, illustrating the cylinder and tank systems respectively.

#### GENERAL BUILDING NEWS.

**EDINBURGH.**—Dr. Rowand Anderson has prepared plans for a new Free Church to be erected at Braid-road, South Morningside, a newly-formed suburb to the south-west of Edinburgh. The congregation have for some time met in a small hall, which was designed by Dr. Anderson, and which will form an adjunct to the new church, the estimated cost of which is about 8,000l. The church is to consist of a nave 98 ft. long by 33 ft. broad, with narrow aisles and transepts. At the north-west angle there is a tower 30 ft. square and 83 ft. high, surmounted by a lead-covered spire, 65 ft. high. The aisles have no windows, the interior being lighted from the clerestory and east and west gables. There are two windows in each compartment of the clerestory, which are square-headed, and of three lights, filled with tracery in the upper part. The window in the east gable is pointed, of seven lights, and in the west gable are two pointed windows of three lights each. The style adopted is that of the Thirteenth Century, and the accommodation provided is for a congregation of 800. This church will occupy a site in the immediate proximity of the recently-erected and very effective parish church, designed by Mr. H. J. Blanc, and the two buildings will naturally challenge a comparison between their respective merits.

**THE DEVELOPMENT OF ALDRINGTON, NEAR BRIGHTON.**—The *Brighton Herald* says that since the sale by auction, in May and September last, by Messrs. J. W. Stride & Sons, the auctioneers have negotiated sales in land and houses on the estate amounting to upwards of 20,000l. The purchasers, it is believed, contemplate developing large portions of the estate: new roads will be formed, attractive villas built, belts of trees planted (a wise project), and other improvements will be carried out. The Aldrington estate embraces an area of over 300 acres. To show the comparative values of some portions of the estate, negotiations are stated to be pending for the transfer of land en bloc at the rate of 2,000l. per acre, whilst other parts fetch the very low sum of 200l. per acre,—these extremes affording plenty of scope for speculation.

**COLDRED CHURCH, KENT.** The new Bishop of Dover performed his first official duty on Wednesday, the 29th ult., by reopening the ancient Church of St. Pancras, at Coldred, which has recently been restored. The funds have been collected mainly by the exertions of the Rev. C. B. Shirres, vicar of Sibbertowald, with which parish Coldred is united, Lady Guilford, of Walden Park, being the principal contributor. The church is a small building, consisting only of a nave and chancel, with a south porch. Until recently the fabric was

in very poor condition, the accumulated earth having for centuries risen above the original level, and thus making the walls damp and the interior cold and comfortless, added to which the wind found free access through the old tiles of the roof at the decaying plaster of the ceiling. The porch was in a dangerous condition, although its age was not very great. The bell-turret, at the west end (there is no tower), had lost its original gables, and the plastering of the interior was greatly decayed. All this has now been changed. The roofs have been lined with felt to exclude the cold, the earth has been dug away from the bases of the walls, and proper channels formed to prevent rain-water from damaging the foundations; the falling porch has been rebuilt of open timber-work, of larger dimensions, to allow of easy ingress and egress. The ceiling has been boarded, and the dreary-looking aspect of the interior removed by the colouring the walls in warm but subdued tints, relieved by some effective patterns and bands. The lost upper part of the old bell-turret has been added, and the internal passages have been laid with bright blue and red tiles, and the exhalation from the ground has been prevented by a layer of concrete. The works have been carried out from the plans at Dover under the direction of Mr. E. P. Loftus Brock, F.S.A., architect, of London, by Mr. W. Adcock, builder, of Maison Dieu yard, Dover. The church is remarkable as a specimen of antiquity. When it was visited by the British Archaeological Association during the Congress held at Dover in 1883, Mr. Loftus Brock pointed out that there was good reason for the belief that the church had been erected in Saxo-Norman times, since the angle-quoins had been formed originally of rough flint in very primitive fashion. The church is now repaired in a modern style, and by different hands, with Caen stone, evidently the work of early Norman builders. The church was again repaired in the middle of the fourteenth century, of which date is the nave roof, the bell turret, and a window on the south side. The fifteenth century witnessed the remodelling of the chancel. The church is one of the few buildings dedicated to St. Pancras, an early saint having been martyred at Rome in the fourth century.

**A NEW CHURCH FOR NEATH, SOUTH WALES.**—The foundation-stone of a new church for the outlying district of Tonna was laid on the 6th inst. The building will be cruciform on plan, with semi-circular apse and lofty tower and spire on the western side of the north transept. The stone for the walls will be raised on the estate of the donor, and the total cost will be about 3,000l. Mr. E. J. Lingon Barker, of Hereford, is the architect.

**A NEW EAST-END "DOSS-HOUSE."**—There has recently been erected at the East-end, from the plans of Mr. R. J. Lovell, A.R.C.B.A., a new model "Doss-house." This contains accommodation for forty-five lodgers. The top floor is devoted to beds with screens between; and the two lower floors have "cubicles," which really form a distinct room for each lodger. Each cubicle is fitted with shelf, seat, and looking-glass. On the ground floor is a large entrance-hall and stone staircase to each floor, with water-closets on each landing; a common kitchen, fitted with lockers, one for each lodger; a "deputy's" room, bar, and pantry and store. On the basement are the lavatories, with hot and cold supply to each basin; bath-rooms, lined with glass bricks, with hot and cold supply. Deputy's bedroom, and washing-room, with appliances for the lodgers to wash and dry their clothes. There is a large hall, with the roof of the house flat, serving as a recreation-ground and for smoking-place in summer for the men.

#### SANITARY AND ENGINEERING NEWS.

**TEDDINGTON SEWERAGE WORKS.**—The Teddington Local Board have, we understand, upon the advice of their Surveyor, Mr. Henry York, placed an order for sewage pumps with Messrs. S. Owen & Co. They are to be on Mr. J. C. R. Okell's patent. The quantity to be raised is 54,000 gallons per hour. Mr. J. C. Melliss, of Gresham House, is the consulting engineer.

**SEWERAGE OF HESWALL.**—At the meeting of the Wirral Sanitary Authority, on the 12th inst., the Engineer, Mr. Charles H. Beloe, M. Inst. C.E., reported that the system of sewers at Heswall was practically completed, and the houses might be connected with the sewers at once. This work has been in progress since March last, and has been attended with considerable difficulty, nearly a whole of the excavation being in hard rock. The total length of the sewers is about 4½ miles, and they are composed of stoneware pipes supplied by Messrs. Denton & Co., of St. Helens, and laid with Stanford's joints. The several sewers discharge into a large brick tank sewer, 260 ft. long by 7 ft. 6 in. and 4 ft. 8 in. wide, which will serve as a reservoir to hold the sewage while the tide is up. On the ebb side the sewage will be discharged into the River Mersey through a line of cast-iron pipes, 9 in. diameter, which are carried to low-water mark, and are supported on strong timber piles firmly driven into the shore. Special provision has been made for flushing these sewers by large flushing-tanks be-



structed at the end of every branch sewer, oh will be supplied with water from the n of the West Cheshire Water Comy. Owing to the precarious nature of the ind as Howell it has been deemed ad- able to break the flow of sewage into sections means of specially-designed trapped manholes, oh will also prevent the sewer gas from mulating at any one spot and compel it to escape at numerous points in the system. In ar to prevent any objectionable smell arising in the sewers, all the manholes are furnished a special deodorising baskets, designed by the ineer, and filled with "polarsite," through h the sewer gas must pass. The amount utioned by the Local Government Board to be ended on these works is £4,700, and it is not eeted that this sum will be exceeded. The ole of the works have been designed and carried under the personal supervision of the Engineer the Authority, Mr. Charles H. Beloe, C.E., of Liverpool, and the contractors for the works were Messrs. Thomas & Co., of Danby-et, Liverpool.

ELL-SINKING AT HOMERTON.—The Hackney rd of Guardians, finding that they were paying r year for the water-supply to the Union rkhouse at Homerton, consulted Messrs. W. wn & Son, Artesian Well Engineers, Tottenham, who recommended them to carry out the following ks. They have sunk a shaft 80 ft. deep, with -iron cylinders 6 ft. in diameter, and from this nt continued with a 14-in. boring, carried to a total depth of 400 ft. into the chalk n. They also designed a 25-horse power engine a 12-in. long barrel pump, with a 3 ft. stroke, h is fixed in the 14-in. bore-hole at the depth 260 ft. from the surface, with a total lift of ft., and giving a yield of 150,000 gallons per day. The best working month, supplying the building without the aid of the water company, giving every satisfaction. The total cost of ying out this work was 2,800*l.*, and the con- tractors agreed to forfeit half the cost of the outlay 100,000 gallons per day was not raised. The e contractors have also carried out similar work the City of London Board of Guardians at their lybrary.

# FOREIGN AND COLONIAL.

FRANCE.—The monument to Flaubert, by Chapu, which we drew attention when speaking of the on sculpture of this year, is to be inaugurated at the next Sunday. Next year the works are to be commenced for the monument at Reims in on Joan of Arc, the cost of which is to be ayed by a public subscription which has now ounted to 110,000 francs.—The Government occupied with a scheme for the establishment of eological museums in Algeria. A committee has been formed in the department of Aisne for the Jean of Arc monument, a statue to be erected euvreiroir, in the chateau of which the heroine was risoned.—The competition opened for a new ch at Aix-les-Bains has resulted in the first le and the commission for execution being given H. Arthur Berin, of Chambéry; the second pre- ize going to M. Joseph Aix, of Lyons. The ding is to cost 300,000*fr.*—Some remains of a an theatre have been discovered at Lyons, in haring the approaches for a bridge which is uite the district of Fourviere with that of Croix- euse. The steps of the theatre appear to have as been used up, in course of ages, as a quarry, the substructures remain.—In spite of the ling of the Seine, the work for the new bridge onflans is being carried on, the piling having commenced from the Ivry side.—M. Henri uschi has presented to the Ecole des Beaux- a curious collection of six hundred specimens eoloured marbles such as may be employed in uration. The series, which is believed to unique of its kind, has been placed in the Salle de la Construction, where architects e decorators can study or refer to it.—The Municipal Council of Dinan have decided to e the plaster-status of Duguesclin, in the lo square of the town, by a bronze one to be uted by M. Caravazius, a young sculptor who already produced a statue of the celebrated stable for the monument of the Comte de Cham- l at Ste. Anne d'Auray. The state will be id to supply the bronze; the cost of modelling statue will be borne by public subscription.—The ancient collegiate church of Lonn (Vienn), ch dates from the fourteenth century, is in ress of being transformed into a covered ket. (What does the "Société des Amis des uments" say to this?)—The "Société éole des Chemins-de-Fer Économiques" has been ounded to commence this month new lines a Sancoia to Lapeyrouse, and from Châtea- lant to La C. erche.—The Municipal Council Amoges has expressed officially the opinion that professional school of Céramique ought to be bliated in that town, in order to train up ans and masons in the highest class of work. ousness of this effect has been mitted to the Chamber of Deputies. A new ay line has just been opened in Corsica, from asca to Calvi.

THE TWENTY-FOURTH ANNUAL CONVENTION OF THE AMERICAN INSTITUTE OF ARCHITECTS was held at Washington on the 22nd of October, and was attended by nearly ninety members. Mr. R. M. Hunt, the President, was kept away from the meeting by illness, and the chair was taken by Mr. W. W. Carlin, the first vice-president. Mr. Douglass, on behalf of the City and District of Washington, read an address of welcome, in which he said that during the past ten years permits for 17,733 new buildings in the city had been issued, representing a valuation of 43,133,843 dols. The average cost of buildings erected in 1890 was less than 40 per cent. greater than the cost of buildings erected in 1881, a fact which he regarded as conclusive evidence of improvement in the character of the houses erected. The annual address of the President (Mr. Hunt) was then read by Mr. Kendall, who condemned the practice of leaving all architectural work for the Government in the hands of a bureau of the Treasury Department at Washington. He argued that were the national buildings put in charge of well-selected men, and the duties of the Supervising Architect restricted to a general supervision of them, the Government would be better and more economically served, as then the architect could give more thought to his design and more efficient superintendence to its execution. The Treasurer's report showed that the Institute is in a satisfactory condition financially. The reports of the several Chapters were referred to a committee for consideration and report. The secretary then read reports from several committees,—upon a "Code of Ethics," upon the "Employment of a Clerk of the Works," upon "Railroad Transportation," and upon a "Uniform Contract." These reports were all laid upon the table, without acceptance, for future action. The text of these reports will be found in the *American Architect* for November 1. The committee on "Ethics" declines to submit a definite code of ethics, but recommends "that the topic be kept well and constantly in mind." The report on the clerk of works question sums up distinctly in favour of the employment of clerks-of-works in America. The proceedings of the Convention were continued on the 23rd and 24th ult.

BERLIN.—1,008 matriculated and 355 non-matriculated students have last summer attended the lectures, classes and practical courses of the Royal Technical College. Of the 1,008 matriculated students, 138, or over 10 per cent., were resident foreigners, 60 Russians, 23 Norwegians, 11 Austrians, 8 Japanese, and 5 English (two architects, three engineers). A great increase in numbers is expected this winter. The annual calculations of the cost of the city railroad viaduct (which connects the different main lines and serves for local traffic) show that 27,199,000 marks were spent on acquisition of the necessary ground, and that the construction cost 33,339,000 marks; together 60,538,000, or over 3,000,000*l.* (about 250,000*l.* per kilometre).—The underground telephone connection is now nearly complete. The Post-office, to which the line belongs, intending open a night service, hoping thereby to assist the Fire Brigade service, which will then have more chance of getting their "alarms" as quickly as possible.

SWEDEN.—The amended design for the new opera-house to be built in Stockholm by the architect, Herr Anderberg, has now been completed. In front of the building a terrace will be laid out in a similar manner to the Brühlische Terrasse in Dresden, with a fine view of the most picturesque parts of the city, whilst the ground-floor of the building will be occupied by a first-class café, &c. Two broad marble stairs will lead up to the terrace. The principal entrance to the opera-house will face the Square of Gustavus Adolphus, opposite the Royal Palace, and consists of a vestibule with a fountain in the centre. There will be a separate entrance to the Royal box. Through the new passage a saving of about 28,000*l.* on the structure has been effected.—The great new Seraaphim Hospital, now in course of construction in Stockholm, is approaching completion. The architect is Herr A. Kumin.—In order to effect certain important street improvements in Stockholm the corporation has purchased half a million square feet of ground, at a cost of 36,000*l.*—A new municipal church is to be built in Sundsvall (a town totally burned down last year), at a cost of 20,000*l.*, in addition to a school-house to cost 15,000*l.*—The restoration of the ancient Cathedral of Skara is progressing. Up to the present time 15,000*l.* has been expended in the work, and there still remains in hand 6,000*l.*—The architect (Herr Adrian Pettersson) commissioned to erect buildings for the industrial exhibition to be held in Gothenburg next year, has completed his designs. The principal building contains a large central and five smaller galleries. All the buildings are of wood, and in Norse style.—In consequence of the depressed state of the wood-pulp industry, leading Swedish and Norwegian manufacturers have agreed to a reduction of output for this and next year of 25 per cent.

RUSSIA.—A hygienic and sanitary exhibition is to be held next year in St. Petersburg.—The *Peterburgskij Wydomoni* states that the Russian Ministry of Finance has appointed a commission

to report upon the question of a normal day of labour for workmen in Russia.—The Russian Government has decided upon thoroughly repairing and restoring the house in Zaandam, inhabited by Peter the Great in 1697, whilst working as a ship's carpenter in Holland. It is to be made as much as possible similar to its appearance at that date. The work will be carried out by a Russian architect.

## MISCELLANEOUS.

DISCOVERY OF PETROLEUM IN FRANCE.—According to the Paris correspondent of the *Daily News*, a discovery of petroleum is reported to have been made at the foot of a hill named the Puy de la Foix, four miles from Clermont, in Auvergne. The naphtha which exudes from the rock in different parts is equal to Baku or Pennsylvania oil, and geologists are of opinion that it extends in a subterranean sheet over the whole extent of the vast Plain of Limagne, and is probably to be found at a depth of 1,600 ft. Borings have commenced near the village of Lussac. One of them attained a depth of 450 ft., when a rush of natural gas took place, which caught fire and stopped any further progress.

MR. JOHN THOMAS HURST, C.E., so well-known in civil engineering and architectural circles, as author of the "Pocket Book for Surveyors"; revised edition of Treigold's *Carpentry*, &c., has, we are informed, just retired from the public service, having held the appointment of senior first-class surveyor in the Royal Engineer Civil Branch of the War Office. On the occasion of his retirement, Mr. Hurst was presented with an address by the professional members of the Royal Engineer civil staff as a token of esteem and respect. Mr. Hurst is, we believe, an Irishman by birth, but has for many years resided in London. He is a member of the Society of Engineers.

CANAL BETWEEN THE AZOFF AND BLACK SEAS.—A company, with the Duke of Leuchtenberg, cousin of the Czar, as patron, has been formed for the construction of a canal between the Azoff and Black Seas. The capital is 100 million francs. The canal will be 100 versts in length, and is to be completed in six years. The company will have a proprietorship of ninety-one years.

THE ENGLISH IRON TRADE.—The recent troubles in the money market have not been without effect upon the iron trade. To some degree the present quietness in the English iron market is due to that cause, and the resulting stagnation in business might have been worse were it not the case that the trade, taken by itself and as a whole, is in a healthy condition, awaiting only a slight revival in the demand to fully recover its former steadiness. Pig-iron has been depressed in price. The Glasgow warrant market has been flat, with a downward tendency. Middlesbrough pig has dropped quite 1*s.* 6*d.* In other districts pig-iron is tolerably steady, and the same may be affirmed of Bessemer pig. Finished iron is weaker in price, and steel is likewise easier, with no appreciable change in the demand, however. Shipbuilders have again been booking fresh work, and there is no sensible slackening of activity amongst engineers.—Iron.

LIVERPOOL ENGINEERING SOCIETY.—The second ordinary meeting of the session was held at the Royal Institution, Colquhoun-street, on the 12th inst., Mr. Ferdinand Hudleston, Assoc. M. Inst. C.E., President in the chair. A paper, entitled "Water-pressure Engines," by Mr. John S. Brodie, Assoc. M. Inst. C.E., M. Inst. M.E., of Whitehaven, was read to a large gathering of members. The author, after a general introduction on the subject, dealt with some water-pressure engines which had recently been erected at the Whitehaven Water-works for the purpose of pumping water to a portion of the town which is situated at a high level. In doing so he stated the conditions under which they had to be erected and the work they had to perform, and then proceeded to describe the engines and pumps in detail, giving statistics of their performance, together with the first cost and the actual cost of working. A discussion upon various details of the pumps followed the reading of the paper, and a vote of thanks to Mr. Brodie terminated the proceedings.

WINDOW AT ST. MICHAEL'S CHURCH, HELSTON.—A stained glass window has been placed in St. Michael's Church, Helston, by Mr. T. Davey in memory of his son, Mr. G. T. Davey. The subject of the window is the raising of the widow's son at Nain. It has been designed and executed by Messrs. Clayton & Bell, of London.

TRAMWAY AT BERN.—A new tramway on which compressed air (McKarski system) is used as motive-power has been opened. The new line, of 3 km. length, constructed at a cost of 410,000 francs, has an average gradient of 11.4 per cent., the curves having radii varying between 30 and 50 metres. When the McKarski system was tried in London a few years ago it failed.

CREMATORIUM AT HREIDIRBURG.—A crematorium specially for the Duchy of Baden is to be constructed here on a site given by the municipality. The work will be commenced next spring.



19,628.—CHIMNEY-POTS: *P. & J. Mann*.—The upper portion of the chimney-pots are provided with openings at the side, fitted with hinged covers, all connected with each other by metal rods, in such a way that when at rest each opening or outlet is partly open. In case a strong wind is blowing, the hinged covers on the wind side of the chimney-pot are closed by the pressure; while those on the opposite side are open to allow for the exit of the smoke.





**LONDON.** For the construction of a sewer in Queen street, and street improvements in the place, Mr. J. O. Cook, architect, 1, Euston-road, W.C. For the construction of a sewer in Queen street, and street improvements in the place, Mr. J. O. Cook, architect, 1, Euston-road, W.C.

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# The Builder.

Vol. LIX. No. 2464.

SATURDAY, NOV. 29, 1890.

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Part of Norman Arcade, St. Bartholomew-the-Great, Smithfield.—Drawn by Mr. W. D. West	Single-Page Ink-Photo.
Bridge and Chapel, St. Ives, Huntingdonshire	Single-Page Photo-Litho.
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## Japanese Pottery and Japanese Drawing.\*



THE large and finely-illustrated volume recently brought out by Mr. James L. Bowes on Japanese pottery is not only one of the most beautiful but one of the most useful and rational books upon Japanese work which has been published in England: useful, because it gives a very complete and intelligible analysis of the various styles of Japanese pottery, and rational because the author, although probably the most accomplished connoisseur in Japanese art in this country, is not so indiscriminating in his admiration as to accept as beautiful everything that is Japanese, or even everything that the Japanese themselves consider to be beautiful. Critics who thus combine knowledge with judgment on Japanese art are too rare in this country.

Mr. Bowes is logical and systematic in his division of the subject. He commences with mythological tradition, which is curious if not very instructive. All Japanese reports, he tells us at the commencement, agree in stating that the art of pottery was invented long before the historical period of Japan, which commences 660 B.C. This tradition is based on the fact, as vouched for by the late Mr. Ninagawa, archaeologist in the Imperial Museum of Tokio, that in the earliest Japanese history it is stated that "Sosanowono-o-mi-Kami advised Tenatsuchi to prepare from different fruits a drink in eight vases," but, adds the learned archaeologist, "we are unacquainted with any specimens of these ancient productions"; in which case his theories need not detain us.

Coming to the next chapter, "Traditional," we are on firmer ground, for here we are given figured specimens of very old and undated bits of Japanese pottery which have been dug up from various ancient mounds in Japan. These examples serve once more to point the lesson which every find of very

ancient pottery seems to teach, viz.: that in the earliest periods of which we find any remains of pottery the art was much the same all the world over. There is nothing specially Japanese, as we regard Japanese work in the present day, either in the outlines or the decoration of these ancient vases and fragments of vases found in Japan. They belong to the same general type as the pottery found by Dr. Schliemann and General Cesnola in their various explorations. The outlines are simple but shapely, and the ornamentation consists mainly of striations, oblique, horizontal, crossed, or chevroned, and much like what may be seen in the archaic Greek vase room at the British Museum. They have no affinity with the types which we are accustomed in these days to regard as peculiarly Japanese.

The "Historical" phase treated of in the next chapter commences not, as the Japanese would have it, at 660 B.C., but, according to Mr. Bowes, at about the eighth century of the Christian era. But at this period there is no evidence of the production of anything more elaborate than unglazed stoneware and earthenware made by hand; nor does there seem to have been any marked advance in this respect for the next four centuries, when we come on the first historical artist, whose original name is too long to write, but who became known as "Toshiro," and is recorded to have visited China in 1222, and there learned the art of glazing. "On his return to Japan his knowledge enabled him to select clays of a suitable character for the improved wares which he wished to produce, and he commenced to make small objects, having a slight approach to elegance in form, to which he imparted some degree of beauty by the skilful application of glazes but his skill carried him no further in this direction than simple brown glazes of various shades speckled with black."

The productions which are thus rather unsympathetically described were in fact the small jars of brown stoneware, made for holding powdered tea, and of which there were a number of specimens in the fine exhibition of Japanese work held some time since at the gallery of the Fine Art Society. There is a simplicity of design about these, and purpose-like and practical character, which is in itself admirable as far as it goes; but we

agree with the author in thinking that it is impossible to echo the extravagant admiration which it appears the Japanese connoisseurs have for these objects, and which is probably, as he suggests, a kind of affectation of conservatism which leads them to profess a preference for these plain little brown jars before all the elaborated and often beautifully decorated ware of more modern times. Partly perhaps there is a kind of social sanctity connected with this form of tea-mug, for the taking of tea seems to have been a very serious social function for centuries past, and the author gives, on one plate, sketches of no less than thirty-one different small implements which were necessary to the complete fitting out of a tea-function. But from some further remarks on the same subject on another page, it would seem either that the Japanese are more foolish than they are usually supposed to be in these matters, or else they find a certain serious and *spiritual* enjoyment in mystifying the stranger. In the frontispiece the author gives a coloured facsimile of such an ancient jar, which was sent to him as a specimen of Toshiro's work. It is simply a small brown stoneware jar of a shape rather like a barrel, narrower at each end than in the middle, and as the author observes, presents no feature which an intelligent English potter of to-day would find any difficulty in imitating.

"This object came to England most carefully protected in a double case, the jar being first enveloped in a white-wadded silken bag and then enclosed in a box of *kiri* wood decorated with gold lacquer; this was placed in a second case made of *sakura* wood, and protected by pads of white satin; the outer case bears the late owner's name written in gold, and the character *on-chaire*, the prefix signifying that the *chaire* is entitled to honourable consideration."

This elaborate wrapping up of so simple an article seems something like the kind of childishness which was attributed to Bret Harte's "Heathen Chinese," and which half suggests an idea whether the author of it is not indulging in an elaborate jest at the expense of the credulity of the European.

The frontispiece, just alluded to, is one of the most useful points in the book. It is an admirably executed chromolithograph, printed by Didot & Cie, Paris, giving facsimile representations of nine different characteristic classes of ware, with their approximate dates

\* Japanese Pottery, with Notes describing the Thoughts and Subjects employed in its Decoration, and Illustrations from Examples in the Bowes Collection. By James L. Bowes, Honorary Consul for Japan at Liverpool. Liverpool: E. Howell; 1890.



and so delicately executed that for purposes of comparison they are almost as good as the actual objects. We can here contrast the plain brown jar of seventeenth-century Satsuma work with the delicate work of the early nineteenth century, with its creamy tint, piquant shape, and sprinkling of daintily-wrought and gilded flowers. The Kaga ware of the same date, somewhat similar in general tone but a great deal more formal and conventional in style of ornamentation, is contrasted with the Satsuma; and other well-marked varieties are shown with equal brilliancy and delicacy, and serve to illustrate the information given in the text in regard to their date, place, and method of manufacture.

The dawn of the modern European taste for Japanese ware the author traces to the Paris Exhibition of 1867, before which time there was little real Japanese work known in Europe, the exception consisting mainly of the collection of lacquered work made by Marie Antoinette and now in the Louvre. "The mind," says Mr. Bowes, will "naturally turn in view of this statement to the porcelain known as Old Japan, of which examples may be found in almost every great house in Europe. But this ware does not in any sense represent Japanese art, as it was made to the order of Dutch traders, chiefly during the second half of the seventeenth century, and decorated with designs furnished by European artists." The modern admiration of and demand for Japanese pottery and other work seems to be leading us into somewhat similar complications, for we suspect that not a little that is sold and accepted as Japanese work is now made in this country. The "Old Japan" referred to was made entirely for export, like some classes of goods of Manchester and Birmingham manufacture, and the European style and appearance of it are at once recognisable in comparing the example given in the frontispiece with those by which it is accompanied. This is a white plate painted over with flowers and birds in rather strong colours and picked out or lined with gilding, and has a rich effect of its kind, but is as different as possible in feeling from pure Japanese work. As to the difference between old and recent Satsuma wares, and the curious manner in which the latter were imposed on purchasers (we believe not wilfully) as of the most rare and ancient work, we must refer the reader to the chapter on Satsuma, which will be of use in guarding those who have not mastered the subject from being deceived in like manner.

We cannot pretend here to follow the author through all the mazes of the various styles and dates, which he confesses have taken him many years to unravel, and he probably knows more of the subject than any other person in England. It is more to our purpose to look at the artistic results as exhibited in some of the objects illustrated. Pottery is one of the arts in which Japanese taste is set off to the best advantage, although, as we have seen, the Japanese themselves set a curiously exaggerated value upon some of what are by no means their best classes of work. Japanese and Greek pottery may be said to exhibit, taken broadly, two perfectly different principles of decorating pottery. The ornament in a Greek vase is applied distinctly with reference to the form and design of the vase itself, which is always paramount and controls the applied decoration. The vase thus decorated is intended as an object of art to be studied for its own sake, and to be complete in itself. The Japanese system seems rather intended to render the vase or plate, or whatever it is, an object which will supply decorative effect when regarded in connexion with other things; it is not so much to be studied apart for itself, as an object to contribute to a general scheme of decorative effect of an interior. And the style of decoration which suits the one purpose does not suit the other. The Kioto and Hizen vases figured in Mr. Bowes's frontispiece, and perhaps intentionally contrasted, form a good illustration of this, though not so marked as would be

furnished by a Greek vase and the Kioto cup. The Hizen plate (one of the "old Japan" articles) contains detail which is exceedingly pretty in itself, but the total effect of which is weak; in the Kioto cup the design, regarded in detail, is spotty and even clumsy, and destitute of distinct form; it cannot be said to be beautiful in detail, but the whole vase has a most powerful decorative effect, and would make itself felt among whatever collection of objects it was placed, in a way that a Greek vase would certainly not do. The Kaga ware is more symmetrically designed in detail, and in this respect varies from a good deal of other Japanese pottery, and rather falls between two stools; it is hardly sufficiently interesting merely as detail, and it is not sufficiently effective when viewed from without. The lesson that the Japanese pottery in a general way teaches is, that if we wish pottery to have a powerful general effect on the decoration of our rooms, we should select that in which colour is laid on in masses in a broad and fearless way, without too close attention to detail, rather than that in which detail is very refined and symmetrical and general effect is overlooked. There is no doubt that the former is the general characteristic of Japanese pottery, and on the whole perhaps it is the best way to use pottery in a decorative sense. At all events the demand in the present day for colour effect naturally gives the Japanese pottery a high place. A collection of Greek pottery of the best period would show a far higher and more refined art, as far as design is concerned; but as far as decorative effect is concerned, it would be nowhere besides Japanese. And this appears to be the real defence of the curiously haphazard and cross-corner manner in which decoration is applied to Japanese pottery. It is the work of a people who attached great importance to the general decorative effect of an apartment, and who designed everything to assist that effect. And as far as pottery is concerned they were on the whole right. Occasionally they are too *bizarre* and angular even in their pottery; but as a general rule it may be said that if you wish for a rich and decorative effect in your breakfast or dinner china, you will be more likely to get it by selecting a design on Japanese than on Greek lines.

Before taking leave for the present of Mr. Bowes's book, which we strongly recommend to the attention of all who are interested in Japanese art, we should like to call special attention to one remark in it, which indicates a very interesting phase of Japanese character, and which perhaps throws some light on the feeling for finish of workmanship which is so characteristic of the nation. In Japan, we are told in the "Historical" chapter, there have been no museums, and those who possessed objects of art that were worth seeing would exhibit them a few only at a time; a simple vase, or a pair, or a *kakemono* (hanging picture) would be placed in a recess in the room formed for the display of such objects; when another season came round other works would be exhibited in the same way. "It would be considered the height of vulgarity in my country," said a Japanese visitor to the writer, "to display all these works at once, as you do in your museum." It is not surprising that people who think thus should take care that each work they produce is worth seeing and will bear examination in detail; a lesson not without value to a country like this, where *objets d'art* are produced wholesale, and even by machinery.

It is in this appreciation of the highest and most delicate finish in decorative work, for the pure love of it, that the Japanese show themselves so eminently a nation of artists. But there is a curious anomaly in their coarse and childish drawing of the figures of men and animals, which shows that their powers have a very narrow range. This is illustrated especially just now in London by the exhibition of the drawings of Hokusai at the Fine Art Society's Gallery. Hokusai belonged to the latter part of the last and

early part of the present century, and is reputed one of the most able and distinguished of Japanese draughtsmen. We quite concur in the opinion expressed in the preface to the catalogue, that he was one of the most honest workers that ever toiled in the field of art. There is a passage translated from his preface to one of his own books, which is very interesting, recording how at the age of six he had a mania for drawing the forms of objects, and calculating how much more he will improve as time goes on, so that he thinks if he lives to a hundred and ten "every dot and every line from my brush will be alive. Written at the age of seventy-five by me, formerly Hokusai, now Gwa-kiō Rojin—the old man mad about drawing." This is charming; but the drawings executed by this naturally-gifted enthusiast only form a fresh example of the limitations of Japanese perception. There are admirable drawings of birds, as usual; a splendid study of a red lobster, and so on; but the figure-drawings are little better than absurdities. Like other Japanese, he has a faculty of seizing the grotesque or ludicrous in a momentary action of a figure or a group of figures, as in the little sketch of a group of people under umbrellas, printed in the margin of the catalogue preface, where nothing is seen but the umbrellas and the legs of two or three figures, yet there is a general impression of a group of people and of a certain movement in the group. But this kind of indication, when the knack of it is once obtained, is not very difficult to repeat *ad libitum*, and the Japanese do so repeat it, till one gets tired of these little jokes, the humour of which was amusing at first. Hokusai had also, like other Japanese artists, a faculty of giving a great deal of character to a woman's costume, and as the Japanese woman is all costume this does not make any demand upon figure drawing. There is an idea of motion well conveyed, too, in one or two of Hokusai's figures of women walking in their voluminous garments, the whole mass of which seems to move along together like a ship in full sail, as in No. 17, "Young Lady and Child Walking." But the face seems to be the last thing to which any care is devoted. The woman's costume is elaborately and apparently truthfully indicated; the face is an expanse with a dot for a mouth and two streaks for eyes; the expressions of all are the same, if they can be said to have any expression. But look at some of the figures of men, and their extraordinary attitudes, and the still more extraordinary drawing of hands and feet (the latter especially). How is it that people who can make a beautiful drawing of a bird's claw cannot draw or even indicate correctly a human foot? Look at the foot in the sketch of the "Sculptor of Masks" (45). Look again at the "Study of a Tiger" (19). It is not like a tiger, it is not like any animal in creation. Then for the interpretation of nature, look at the "Study of a Wave" (12), which we can only understand on the supposition that it is the original wave which gave rise to the sailor's title of "cat's-paw." Look at "Sagami Bay and the Island of Yénohima" (80), with a few decorative waves put in, in parallel lines, in the front of the bay. Did Hokusai see waves like that? There is a large panel, "Corner of a Forest with high fir trees" (186), which is nothing more than a big smudge with some trunks of trees at the bottom of it. Any one could do that; why is it exhibited? It was creditable to Hokusai that he tried to draw trees, but it is quite evident he failed with them, as he did with women's faces and men's feet, and tigers, and waves. It is very strange that people who can draw a certain class of objects so well should draw others so badly; but it is still stranger that these grotesque attempts should be hung up in an Art Society for us to admire, and that a crowd of people should be simple enough to go and admire them merely because they are Japanese.

THE ANNUAL DINNER OF THE SOCIETY OF ENGINEERS is fixed for Wednesday, December 10, at the Holborn Restaurant.



A PROBLEM IN VENTILATION BY HEAT.

BY MR. W. P. BUCHAN, SANITARY ENGINEER.\*

SOME time ago I was testing the speed of the air up the ventilating-pipe from off the ceiling of a church. The vertical part of this pipe was about 40 ft. high, while the diameter of the pipe was 18 in. Near to the bottom of the vertical pipe there was a small circular gas-tube, with provision for lighting a dozen of gas-jets when wished. I first tested the ventilating-pipe without the gas being lighted, when the speed indicated was 30 linear feet per minute. With the gas lighted, the speed rose to 300 linear feet per minute. This was no great speed, but it showed that the heat of the gas gave considerable increase of up-current. Then the question occurred, Would the speed be still further increased by suspending a piece of 2-in. diameter pipe, and say, 3 ft. long, of thin sheet-iron a little above the gas-jets, so that when these jets were lighted they would heat the 12-in. tube, and so increase the up-current? As it was going to be rather troublesome to make the experiment with the 6-in. pipe, I constructed a 6-in. diameter pipe, 3 ft. long, with a 3-in. diameter inlet at its foot, but to one side, the bottom being closed with a lid. The 3-in. diameter inlet was to suit the anemometer.

Upon suspending a piece of 3-in. diameter thin sheet-iron tubing, 1 ft. long, above a No. 4 Bray's gas-burner, placed inside of the 6-in. pipe, the speed indicated, with the gas lighted, was 520 linear feet in two minutes. With the 3-in. tube removed, the speed rose to 585 ft. in the two minutes, showing a difference of 65 ft. The inner tube in this case, therefore, did more harm than good. Another experiment was thereafter made with a piece of plain sheet-iron about 6 ft. long and 5½ in. wide, suspended a little above the gas, with the result that with this sheet-iron plate on the speed indicated was 55 ft. in two minutes. Upon removing the plate the speed rose to 580 ft. in two minutes. The use of the plates would, therefore, appear to be a mistake, and a pure waste of money also,—the up-current being fully 5 per cent. less with it than without it.

This loss of speed with the inner tube or plate suspended above the gas I attribute to the extra friction.

As Mr. Aitken, of Darroch, has stated that there are about 400,000,000 particles of matter in a cubic inch of air above a Bunsen gas-burner, we have still an ample quantity to heat the air in a ventilating tube, without the addition of either the inner tube or suspended plate above referred to, supposing the number of particles of matter above an ordinary gas-jet were less than a quarter of the number mentioned by Mr. Aitken.

In order to get the full value of the heat and conserve it for the up-current, it would be all right to wrap asbestos or felt round the outside of the pipe, but suspending large concentric pipes or plates inside the outlet ventilating pipe in the manner described, appears to me to be a pure waste of money. They retard the up-current, and so harm the ventilation, whether the gas is lighted below them or not; and in many cases, in practice, the gas would not require to be lighted, as when there was wind or other natural cause to produce a good up-current. In this latter case suspension of a pipe or plate inside of the outlet pipe would simply be a *continuous* check. In fact, in thousands of cases, where the outlet ventilating pipes put in large enough, and fitted up properly, no gas would be needed,—as, e.g., for one-storied schools and for churches and many halls, &c.

SOUTH WALES ART SOCIETY AND SKETCHING CLUB.—The third annual exhibition held under the auspices of this Society was opened on the 19th inst. in Cardiff.

\* Read before the Philosophical Society of Glasgow on November 10.  
† The pipe would have answered its purpose better had it been 36 in. diameter.

NOTES.

It has been said that among the matters which will have to be taken into account by the historian who deals with the present age, co-operation and strikes will occupy a prominent position. The latter have, perhaps, attained their prominence mainly in consequence of the principle of co-operation underlying trades unionism, and a connexion may thus be said to subsist between the two. But what is understood as the co-operative movement has, of course, aims entirely distinct from those of the unions. This distinction was clearly brought out by Judge Hughes, in an encouraging address to the co-operators at the Crystal Palace last Saturday, when he implored his hearers to pay no heed to "the syren songs of brand-new or old-revived nostrums for setting the world right,—the songs of State Socialists or new trade unionists." The report of the Labour Correspondent of the Board of Trade, which has just been published, states that there were strikes at no fewer than 3,164 establishments during 1889, 67 per cent. being for advanced wages. Now, although a large proportion of these latter were successful,—483 fully, and 315 partially,—it is shown that the average loss to each individual in wages while the strike lasted amounted to about 34. 6s. This is equivalent to 1s. 3d. per week for a twelvemonth, and, as the strikes committees and trades unions expended a further sum of 63,636*l.* in support of the men, it certainly discounts the "success" considerably. Nevertheless, the fame of this same success seems to be inducing destitute workers from various quarters to flock to our shores. Only this week a batch of 300 Polish Jews arrived to swell the already crowded ranks, allured by the assurance that work is plentiful and well paid for in this country. Some twenty of the strikes of 1889 were what have been termed "sympathetic" strikes,—and this year they have, unfortunately, been still more numerous. The spectacle of trade after trade being called out to show their "sympathy" with entirely different industries by thus bringing additional pressure to bear upon employers is becoming very common, and proving very irritating and vexatious. It cannot but be regarded as fortunate that the great Australian strike, which proceeded on this method, ended in disastrous failure; for the principle is mischievous, and causes universal uncertainty, mistrust, and uneasiness, thus putting a restraint upon commercial enterprise. It is to be hoped that similar attempts at "coercion" in this country will meet with a similar fate, and that strikes of this nature may not figure so largely in the returns next year as they will in this.

AMONG the Bills announced at the opening of Parliament on Tuesday is one by Mr. Causton, "to regulate and limit the powers of the Metropolitan Water Companies in respect of their charges for the supply of water," and one brought forward by Mr. G. Bruce, "to provide for the supply of water by meter for domestic purposes within the limits of supply of the London Water Companies." We have long considered that the meter system of supply is the real remedy for most of the disputes between the water companies and their customers, and we hope this idea will be advanced a stage, though we do not expect the Bill to be passed this Session. We hope success will attend Mr. Jacoby's Bill "to limit the hours for the playing of street organs and other musical instruments in the metropolis." We can only regard this as a half measure, and we hope to see the day when the organ-grinder will be turned off the London streets altogether; but even to limit his hours would be something. The announcement of the Bill, we observe, was received with "laughter." It is no laughing matter to many people. Mr. Morton proposes a Bill to provide that "railway return tickets may be used at any time," from which we gather that Mr. Morton does not know much about

railway matters. If he limited the conditions to "any time within the year or half-year of issue," the Bill would have a chance of being passed, and would be a convenience to the public; but inasmuch as railway tickets are practically receipts for money, it is absurd to suppose that their use can be made entirely independent of the annual accounts. Sir W. Lawson's proposal for an address to her Majesty "praying that when she confers any honour or title on any of her subjects she will be pleased to state the services for which such honour or title is granted," would, if it were passed (of which we do not suppose there is the least chance), perhaps exercise a salutary effect in rendering the granting of titles a distinct acknowledgment of worthy service in all cases, instead of being, as it too often is, an empty honour bestowed according to routine, fashion, or Court interest. If the proposal actually comes up for discussion, we shall at all events be sure of an amusing speech from the mover of it. Mr. Lawson is to move "that it is expedient to open National Museums and Galleries on Sundays at certain hours and with special regulations," a moderate and guarded way of putting the matter which it is to be hoped will conciliate some of those irreconcilables who have hitherto turned their backs on every suggestion of the kind. Sir H. Roscoe promises a Bill in regard to technical education, and the Government, in an indefinite kind of way, promise us more legislation on the perennial subject of the public health. With these and other measures we shall deal when the texts of the Bills are printed.

THE accident at Jersey City, where the wall of an immense four-story building fell under the pressure of a high wind, seems to have been another Tampleton mill case: an unroofed building with a great expanse of thin wall (1 ft. thick, is the statement), which might have been safe when built, but was evidently not safe while building. One man was killed, and about a dozen injured. Supposing that the report is correct as to the circumstances, this is another warning against the practice of designing buildings so as to be risky and insecure during erection. If those who design and erect buildings so as to be in danger of falling while in progress were brought in guilty of manslaughter in case of a fatal accident, it would perhaps have a wholesome effect.

IN reference to the case of Noble v. Yates, commented on in a "Note" in last week's *Builder* (page 401), we have received the following letter from a member of the jury (who gives us his name and address), which throws some new and useful light on the case, and confirms our view that, although in this case, owing to the circumstances mentioned by our correspondent, the plaintiff failed to obtain a verdict, in a general sense it must certainly be the duty of landlords having houses on view for the purpose of letting to see that they are in such condition at the time as not to cause accidents to persons going over them. The letter is as follows:—

"Sir,—In the paragraph under 'Notes' in this week's *Builder* the verdict in the case of Noble v. Yates is somewhat misleading, owing, no doubt, to the fact that the report of the trial presented to you was very briefly summarised. It is a fact that the verdict was legally given in favour of the defendant (Yates), but it was only under the following very special circumstances of the case, viz.:—The plaintiff could not positively satisfy the jury that she was the would-be tenant, being then accompanied by her previous landlady (who was also looking for a house); and the fact was, that being told this house was not to let,—having no notice up to that effect, they went into it in preference to the other two which had notices up. Taking these and other circumstances into consideration, the jury, after three hours' deliberation, brought in a verdict for the defendant, but with a strongly-worded rider that there was some moral blame attached to the defendant by the keys of this house being on the same bunch as the two which were admittedly to let, and, as a consequence to this rider (which the Judge agreed with) the defendant consented to make the plaintiff some reasonable compensation.  
I should be much obliged if you would mention



these facts in your next week's 'Notes,' as had the circumstances been only as reported by you the plaintiff would, I have little doubt, obtained the verdict with substantial damages.

ONE OF THE JURY."

THE proposed Berlin International Art Exhibition for 1891, alluded to on page 393 *ante*, has now been definitely decided on. The "programme" drawn up by the "Verein Berliner Künstler," under the presidency of Professor Anton v. Werner, has been approved of by the Government, the latter having promised to aid the scheme in every way. The Empress Frederick has accepted the "patronage," and wishes to use her influence to the benefit of the exhibition. The Emperor intends granting special awards in the form of gold medals, similar to those given away in 1886 at the so-called Jubilee Exhibition.

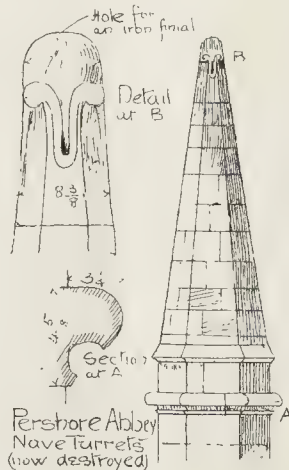
AMONG forthcoming new illustrative works on London, we hear of Mr. Loftie's "London City," which will contain more than three hundred illustrations, engraved in Paris, from original drawings by Mr. William Luker, jun. According to the list and prospectus issued from the Leadenhall Press, we gather that all the views will be of existing buildings, scenes, and episodes of London life. Some, indeed, are of rather a commonplace character—such as "Juvenile Ball at the Mansion House," "Bennett's Clock in Cheap-side," "A Mid-day Snack," "Struggle for the 'Bus (sic), New Bridge-street," "Sportsman Office, Fleet-street," "Early Morning, Winter" (carting the snow), and so on; whilst by "Middle Temple Bar" and "Old Gateway in Chancery-lane," we hope drawings of Middle Temple Hall and of Lincoln's Inn-gatehouse (rather than of the entrance to Rolls-yard) are intended. The list needs revision in other respects; and "Petticoat-lane" and "Little Bridge-street" are names of the past. On the other hand, many of the subjects are aptly chosen, and should form a useful record of what are now familiar incidents of daily life in the City. A stranger's interest might be aroused by the mass of over-head wires, the crowd looking at the pages of *Punch*, and the street-orderly boy,—busy at his calling he plies his shovel,—delineated in the view of St. Bride's steeple, as seen from Fleet-street. The "old garden at No. 4, Crosby-square" is, we believe, the private garden which Mr. W. Besant claims to have discovered, and of which he hesitated to specify the situation lest it should be forthwith built over. There it is, however, and not quite hidden from sight. Mr. Alfred Beaver's work upon "Old Chelsea," with his own illustrations, is to consist of eighteen monthly parts. We are glad to notice that he has announced his intention of taking nothing upon trust, and of verifying everything point by point. The illustrations to Mr. George Clinch's "Marylebone and St. Pancras" have been taken, mainly, from the Crace Collection and other sources in the British Museum, and will, so far, be tolerably well known to students of London topography. This later volume should form an appropriate companion to the author's recently published "Bloomsbury and St. Giles's." Mr. Justin McCarthy's "From Charing Cross to St. Paul's" with twelve plates and many other engravings of street scenes from Mr. Joseph Pennell's drawings, was announced for publication this week.

MR. G. C. DOWNIE, Rose-street-lane, Edinburgh, has published eight cleverly-executed drawings representing views of that city as it might have been, and as it may be, should the railway companies have their way. One of the most striking of these drawings exhibits the Princes-street Gardens with the Nor Loch occupying the whole breadth of valley. In place of the earthen mound which cuts the valley in two, there is a suspension-bridge, so that, as viewed from a point above St. Cuthbert's Church, an expanse of water is seen extending eastward to the base of the Calton Hill, reflecting on the right hand the

Castle rock, and on the left the wooded terrace in front of Princes-street. The same scene is exhibited as in the possession of the railway companies; the whole breadth of the gardens is covered with rails, and the Scott Monument utilised for railway signals. The market-gardeners, fruit merchants, and green-grocers have drawn up memorials to the Town Council urging the preservation of the Waverley Market, which meets their requirements in a way that a similar building on another site could not do. A memorial to a like effect is being circulated amongst the citizens in general, and is receiving the signatures of a very large number of influential citizens.

THE Duke of Cambridge will preside at an entertainment to be given on the afternoon of Saturday, December 13 next, in Prince's Hall, Piccadilly, in aid of a fund for purchasing an organ for, and restoring the chapel at the Royal Military Asylum, Chelsea. This was founded by the Duke of York for children of soldiers of our regular army, and built in 1801-2, after the designs of John Sanders, architect. It is built for the most part of brick, with stone dressings; the principal and south-west front, towards Burton's-court, has a Classical portico with an order of four columns and pediment.

THE Capital and Counties Banking Company having purchased St. Andrew's House, Pershore, and the adjoining houses, have built a new wing, made other alterations and additions, and opened them as their business premises. The old disused chapel in the basement, with walls 6 ft. thick, and heavy vaulted ceiling, now forms in part the bank strong-room. This curious old structure was for years a matter of speculation as to its date and the purpose for which it was built. It was generally supposed to date from the fifteenth century, but upon opening out the back of the vault for the insertion of one of Milner's fireproof doors, it was found to be built with blocks of Perpendicular tracery and Early English moulded arch voussoirs taken from the Benedictine Abbey at the destruction of the nave by Henry VIII. The chapel must, therefore, have been built for the use of the Catholics after the Reformation. It was found that cart-loads of finely-moulded Early English and later work were buried in the foundations, together with bold window tracery of large size. Portions of the western turrets of the nave, of Early character, were brought to light from which the architect, Mr. Lunn, after carefully patching them together, took measured drawings. We add some details copied from the sketches which



he has kindly forwarded to us. The whole of the front ground-floor appears to have been

a large hall, about 40 ft. long, with fine ashlar walls of Painswick stone and huge oak beams. A circular turret staircase, partly destroyed, formed the communication with the chapel. The Banking Company's local managers, Mr. Slatter and Mr. Pittway, have had all these interesting relics preserved with the greatest care.

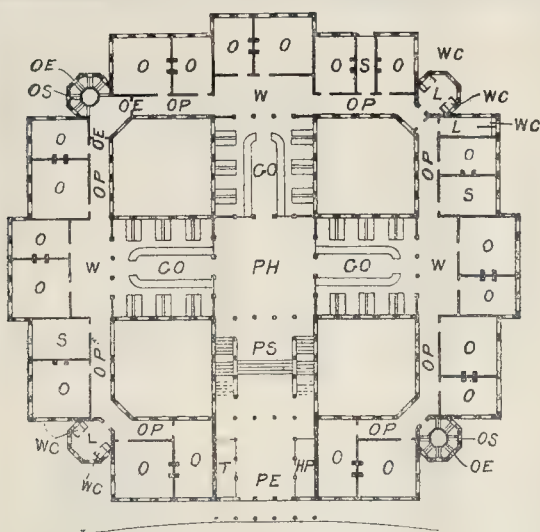
IN the early part of last week there was an unusually dense fog in Dundee and its neighbourhood, on which occasion it appears that a gentleman belonging to the Chemical department of University College, Dundee, took the opportunity of investigating the amount of carbonic acid in the atmosphere within the College grounds at eight in the morning when (as we gather) the fog was at its thickest. He found this amounted to over eight volumes per 10,000, or more than double the normal quantity; so it was stated in the *Dundee Evening Telegraph*. It is now the first time that fog has been analysed, but we do not know whether attention has been drawn to a superfluity of carbonic acid in previous cases. The point is of some interest in regard to the origin of fogs and their possible influence on health.

THE fire at Wellington Barracks the other day was much less fatal than it might have been, owing to the circumstance that it occurred by day and not by night. As it was two children lost their lives. The "Rookery" (such is the suggestive name by which the quarters of the married non-commissioned officers has long been known) was condemned as unsafe and insanitary twenty-five or thirty years ago, and the censure passed by the coroner's jury upon the War Office authorities was therefore well-deserved and not one whit too strong, as all who knew the "Rookery" can testify.

A CORRESPONDENT informs us that on Friday of last week a bazaar was held in the Grange Free Church, Edinburgh, the proceeds of which are to be applied in providing accommodation for ladies who may faint during the time of service. It is to be inferred, therefore, that fainting is a common occurrence amongst the ladies of this congregation when in church. This is not to be attributed to anything sensational in the service, but to the bad ventilation of the building. The interior is fitted up with cumbersome galleries, the object having been to provide sittings for the utmost possible number of persons within a given space, the consequence being that the air becomes speedily vitiated, and fresh air cannot be admitted in sufficient quantity without producing draughts. This is only one of many instances of the absurd fatuity with which churches, concert-halls, and other public buildings are crammed fuller and fuller without it even occurring to anyone, apparently, to reflect that each fresh person introduced means so much greater consumption of oxygen. This they are left to find how they can, and then women faint (and sometimes men also) from sheer want of air to breathe.

THE present is the right time for cutting down trees. Householders should bear this in mind, since many buildings are spoiled by the too close proximity of trees. It is not only houses, but public buildings, such as village schools, which are often injured by trees. The picturesque group of elms, shady in summer, casts in autumn thousands of leaves into gutters and pipes. Hence damp and injury to walls during the winter. Another point to be borne in mind at this season of the year is that trees are often planted too close to houses. It is forgotten that the young, bushy coniferous tree, now 6 ft. high, will in a few years become a forest tree. It will be spoiled by proximity to a building, and it will also spoil the house. But all over England examples may at this time of the year be seen of trees just placed in the ground by walks and walls, which in no long time they touch.





Messrs. Flockton & Gibbs' Patented Plan for Public Buildings.

P. E. Public entrance.  
P. H. Public central hall or passage.  
P. S. Public staircase.  
G. O. Inquiry or general office.

O. Private offices.  
O. E. Official entrance.  
O. S. Official staircase.  
O. P. Official passage.  
W. C. Water-closet.

L. Lavatory.  
S. Strong room.  
H. P. Hall porter.  
T. Telephone room.  
W. Waiting place.

MESSRS. FLOCKTON & GIBBS have written to ask us if we would publish the plans appended to their specification of the patent in architectural planning which they claim, in order that architects may understand what it is which they are endeavouring to establish as a right of planning of their own. We have not space for the four, but we give one, the most typical one, in response to their request. We quoted on page 357 *ante* ("Notes") the precise statement of claim as set forth in the specification.

WITH reference to the recent judgment in the Bishop of Lincoln's case, it may be apposite to mention that Messrs. Dawson, of Chiswick, have reproduced a picture by Mr. J. L. Floris of this historical trial. The work contains a large number of portraits, but what perhaps some of our readers may consider more important, it represents portions of the library at Lambeth Palace, in which the trial took place. It has, therefore, in one sense, an architectural value, though no doubt it will be prized more by persons interested in Church affairs as a collection of ecclesiastico-legal portraits.

SOME weeks ago the "East Grinstead Constitutional Club Company" advertised in our columns for designs for rebuilding some premises at East Grinstead for the purposes of the club. They offered the magnificent premium of *five guineas* for the set of drawings which "in their estimation" best commended themselves, and stated that this fortunate design would become "their property absolutely." They did not bind themselves to award the premium, or to employ the successful architect to carry out the work. These conditions, as stated in the original advertisement, would seem in themselves sufficient to render this invitation an exceptional instance of belief in the desire of architects to do work for nothing. But the further conditions of the programme, which has been forwarded to us by an architect who applied for it, are even more remarkable than the advertisement seemed to promise. It is intended that the lower story should be used as shops, the upper one for the usual purposes of a social and political club, with reading, smoking, billiard, and committee-

rooms, &c. The general design of the buildings is to be in harmony with the surroundings, and "it is to be borne in mind that every part of the structure will be open to public view" (which means four elevations, of course). The position of the site and nature of its surroundings are such, it appears, that "it is very desirable that competitors should see and judge for themselves" how it can best be utilised (the expenses of the visit come out of the five guineas, of course). Finally, as if to put the last touch of delicate irony to the composition, it is stated that any competitor canvassing among the directors will be disqualified! The spectacle conjured up of ambitious or determined candidates canvassing the directors for the chance of a success in such a prize as this is truly pathetic. The "directors" must certainly imagine that the architectural profession is in the last stage of pauperism.

#### A DAY'S WALK IN EAST KENT.

Very nearly thirteen hundred years ago, a notable episode in our country's domestic history was enacted at a now obscure spot in the southern corner of Thanet. For there, in what Pope Gregory the Great called the "*finis, angulus mundi*," St. Augustine landed with a train of forty monks. Gregory had despatched Augustine, prior of his own convent of St. Andrew amongst the pines on the Caelian Mount at Rome, to carry out a mission he had himself long and earnestly purposed to perform—the conversion to Christianity of Æthelberht and his Kentish subjects. The missionary band disembarked at what was then the most frequented landing-place in Britain by traders and marauders from Europe, already signalled by the descent there of the Jutish Hengest and Horsa upon our shores. The place was variously known as Ypwine, Hepe, Hiped, and Wipped, Fleet, in the island of Ruine (whence Ramsgate), and is now identified with Ebbe's Fleet in Thanet. At that epoch the Stoure, the British Doure, consisted of a broad estuary which opened from Sandwich Haven, forming the port of Rhuhtpiae or Richborough. That river, indeed,—in this part more correctly the Wantsum,—served as highway for maritime traffic from the Channel to the Thames mouth, entering the Nore by the Nethergang at Reculver or Regubium. At Ebbe's Fleet, Augustine had first audience of the heathen king. Albeit predisposed, through

the influence of his wife, Bertha, to yield a willing ear, Æthelberht stipulates that running water shall flow between him and the preacher, lest some enchantment or magic should befall him and his people. So he takes his station upon the river's right bank, there to listen to what the monks, aided by interpreters, have to unfold. "Your words," he makes generous yet prudent answer, "are fair, and so are your promises. Yet, inasmuch as they are new and dubious, I cannot give my assent to them, and so leave the customs I have long observed, together with all the Anglo-Saxon race. But, because you have come hither, being strangers from afar, and as I seem to myself to see clearly that what you yourselves believe to be true and good you wish to impart to us, we do not desire to molest you. Nay, we are anxious to receive you hospitably, and to give to you all you need for support, nor do we hinder you from joining all whom you can to the faith of your religion." Thus encouraged, the monks are allowed to cross over the stream, and to hold another colloquy with the king hard by the ancient Roman citadel or stronghold of Rhuhtpiae, whose site is yet marked by the extensive ruins of Richborough Castle, in the parish of Ash, on the Wantsum's right bank. Thence he invites the monks to his capital at Canterbury, and gives them a settlement there by the Stapel-gate, near his own heathen temple. On Whit-Sunday, June 2, of that same year (597), Æthelberht is baptised, and Augustine re-dedicates the Pagan temple to St. Pancras, predecessor of St. Augustine's Abbey.

A walk of about six miles from Deal, through Upper Deal, once within half a mile of the sea, and Shouldham, along a well-metalled high road, brings one, after turning aside to see the church at Worth, into Sandwich, which is entered by the site of the New Gate in the southern wall which has been partly rased and converted into a public promenade. In the northern wall, near the site of Stonhose, or Stonar, are preserved two other of the town gates. These are the Fisher's-gate, at end of Fisher's-street, and about 80 yds. to the west, the Davis, or David's-gate, distinguished by its Barbican and Custom-house. Fisher's-street led through its gate to the old ferry over the Wantsum. The quay separates the barbian from the stone bridge, for the building whereof, in lieu of a draw-bridge, an Act was obtained in 1755. These features of the town are highly-favourite "bits" for painters; and on a fair summer's evening this side of Sandwich presents a most attractive aspect, when the old red-bricked and tiled houses are tinged rose-red by the setting sun, having for background the fine Norman tower of St. Clement's Church. Crossing the bridge the wayfarer is in Thanet. For a short distance an avenue borders the road which leads straight to Ebbe's Fleet, almost due north, and thence by Pegwell Bay to Ramsgate. For three miles this road, passing through the marshes, lies evenly within a large bend of the Wantsum, which with devious course finds its way into the bay. About half-way to Ebbe's Fleet are Shellness and the "Red Lion" inn, at which latter is a ferry. The coast-guard station at Ebbe's Fleet is close to the Stone Lees marshes, by a spot three miles from Sandwich and four from Ramsgate. A field here is the reputed scene of the landing, lately commemorated by the erection of an obelisk, but now lies some distance from the sea. Retracing our steps to the turnpike gate-house we find a road that turns off to Minster. A by-path from this road makes a very pretty and varied walk to the village, which is entered at Minster Court. The Court comprises the old manor house, formerly occupied by monks or stewards of the abbey estates, and dating from the end of the twelfth century. William de Thorne, a monk of St. Augustine's, Canterbury, and native of Minster (1380), gives an account of the endowment of the abbey with some 10,000 acres of land, as delimited by the track of a deer from West-gate, in Birchington, to Sheriff's Slope, near to Monkton. The abbey, since known as St. Mildred's, had for first prioress Domneva, granddaughter of Eadwald, King of Kent, and wife to Merwald, a son of Penda of Mercia. Domneva desired to found a religious house in memory of her brothers, Æthelred and Æthelbriht, murdered by Egbert's consent. Egbert, remorseful, aided her project, and the new church was consecrated by Cuthbert, Archbishop of Canterbury, to SS. Peter and Paul (as had been his own cathedral), where, it is said, stands the present parish church of St. Mary. The convent was pillaged and destroyed

by Danes. St. Mary's cruciform church has a fine nave of Norman arches in five bays; the two transepts and chancel are Early English, vaulted in stone, and the latter has a deviation towards the south. The western tower is in four stages, and has a large turret rising from the ground. The spire is covered with lead, and in the bases of some of its buttresses are Roman tile-bricks. The chancel has two flying buttresses on its northern, and one on its southern, side. A grand view of the country around may be gained from the top of the embattled tower.

A way can be made to Richborough across the Minster marshes, but the route—as the writer learned to his cost—is not easily to be found. The ruins, however, are clearly in sight, and the pedestrian should keep alongside of the railway to Sandwich as far as the bridge across the river, and then follow the river until he reaches the ferry by the "Red Lion." Across the ferry a raised bank leads to the cliff that stands over the river. On this cliff is a rectangular area of nearly six acres under cultivation, enclosed on three sides other than the east by the ruined walls. In the mid-point of the north wall is the obliquely set *porta decumana*. The walls, ranging from 20 ft. to 30 ft. in height, have suffered from an enemy besides their age, for much of their facing stone has been quarried away for road-making material. The amphitheatre is distant about a quarter of a mile southwest. The Castle of Ruppesceter, which has no existing ditch or outworks, is said to have been built by Vespasian, on the then seashore, and to have been perfected by Severus, who, *teste* Matthew of Westminster, built a fastness at Reculver. Here have been dug up a very large number of ancient coins, including some of Severus's time. Having formed a palace of Ethelberht it was sacked by the Danes under Sweyn, and rehabilitated by his son Knut. A pathway along the river leads to the road from Canterbury into Sandwich. Traversing Sandwich to the site of the Sandown Gate, one finds a trackway across the sandhills to the now dismantled castle of Sandown on the northern confines of Deal, which, together with Deal and Walmer Castles, was built by Henry VIII., *circa* 1530, and upon the same plan as theirs. The waves have destroyed the sea-battery, but the interior arrangement of the central tower, its other bastions, with their galleries, inclined entrances, &c., can be readily followed. Sandown Castle formed the prison lodging of Colonel Hutchinson.

#### FROM ITALY.

##### EXCAVATIONS IN THE FORUM OF AUGUSTUS.

I HAVE already described the excavations made by the Municipality of Rome in the southern semi-circle of the Forum of Augustus, last year (see the *Builder*, March 30, 1889, p. 235).

Recently, in making the foundations for a wall with the intention of supporting the earth upon which crosses, at present, the Via Bonella, there have been found some fragments of marble statues, among which is a very interesting bust of Greek marble, 1.22 metres high, belonging to the statue of an emperor, or victorious general. This sculpture recalls the well known statue of Trajan in the Museum of the Villa Albani.

To the decoration of the temple of Mars Ultor, which stood in the middle of the Forum, belong two large Corinthian capitals, a good deal damaged, 0.98 metres high and 0.80 metres in diameter; these formed part of the outer row of columns of the temple.

A great fragment of the marble cornice was also found, belonging to the roof of the vestibule, with richly-moulded sunk coffers, and a central rosette in each, and a second fragment of a smaller cornice, finely sculptured.

The ancient pavement of the Forum has been discovered, composed (like the portion found in 1889) of various qualities of marble, such as *giallo antico*, red and grey granite, *verde antico*, porphyry and serpentine marbles—forming, in the whole, a geometrical figure.

##### MOSAIC DISCOVERED IN THE PRÆTORIAN CAMP.

While some works were being carried out in the pavement of a modern soldiers' building at the Maccao, there has been discovered a portion of an ancient mosaic, belonging to the ancient pavement of the Prætorian Camp which stood in the same spot. The mosaic represents a panther, with a small bell at the neck, between two tigers (*lanitæ*). To the right is an in-



scription, as yet inexplicable. The mosaic is 3.60 metres in length and 2 metres in width, and may be compared with the similar celebrated mosaic of the museum in the Villa Borghese, discovered in 1834 amongst the ruins of a Roman villa, near Torremuova, and interesting for the costumes represented and the animals which the gladiators are combating. Many of the figures of the gladiators have names annexed, as in the mosaic of the Prætorian Camp.

It may be well to mention that the Prætorian Camp, built by Sejanus, the Minister of Tiberius, outside the walls of Servius Tullius, was dismantled by Constantine, and three sides of the enclosure were included by Aurelian in his new wall. To this circumstance we are indebted for the preservation of the exact form of this celebrated camp, memorable as the scene of the principal revolutions during the first three centuries of the Christian era.

#### WELLS AND WINDMILLS.

BOTH wells and windmills date from remote antiquity. The origin of wells is simple enough to the mind; but of the origin of windmills there is no clue, and no record of the originator in the imperfect chronicle of inventors.

Those who have passed over fifty years of existence can look back to the days when all ordinary wells were dug, and staked with bricks, and can remember the wonderful impressions made upon their childish minds by the huge timber sweeps and canvas sails of the ponderous windmills which then capped nearly every hill. The relics of those mills and wells still are numerous, and afford comparison with the modern appliances which science is substituting for them.

Borings were then practised, and artesian wells were not unknown. Linings of iron, too, within them were taking their place. But the driven tube-well, afterwards introduced, was a novelty quickly accepted for both civil and military purposes. To drive by the force of a falling weight a tube into the ground, and in this way tap the water beneath the soil, was a simple and expeditious means to be used by itself or added in supplement to dug wells of larger capacity. Intermediate between the well and the windmill is the pump. The first transporter of water was doubtless the bucket. After hand use came the balanced rod, still used in Eastern lands.

But the pump retains the bucket, and in the force-pump the bucket is supplanted by the plunger. The modern advance in wells, pumps, and windmills was well displayed in the excellent contribution to the recent Breweries Exhibition, at the Agricultural Hall, by Messrs. Alfred Williams & Co., of Great Eastern-street—a firm which devotes special attention to these matters. The woodcut (Fig. 1.) shows the compactness and simplicity of the arrangements of their tube well. The driving-tube (*a*) has a flat-sided steel point (*b*) for penetrating the ground, and a steel plug (*c*) is screwed into its top end. Connected to this plug is an iron guide-bar (*d*), over which freely slides a heavy cylinder or weight (*e*). Attached to this weight are two

cords or ropes (*f* *f*<sup>2</sup>), passing over two pulleys (*g* *g*), fitting on to the top of the guide-bar. By raising and dropping this weight the steel-pointed tube is driven blow by blow until the steel plug is nearly level with the ground. A fresh length of pipe is then screwed on, and the whole driven forward again.

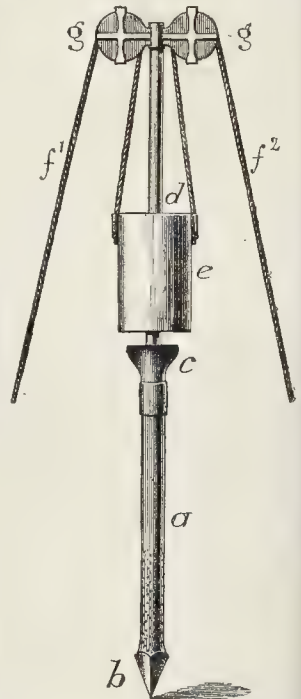


Fig. 1.—Tube Well.

into the ground by the falls of the heavy weight. In this way length after length is added until the depth of the water-bearing stratum is attained. The plug, guide-rod, and driving-tackle are then removed, and a hand or force-pump screwed into the well-tube in its place, Fig. 2. In first using the tube well, the water is lifted by the pump, and then allowed to fall back, thus causing a disturbance of the ground outside the point, and washing out a surrounding cavity free from dirt and small particles of mud or sand likely to choke the access of the water through the perforations into the tube. After this operation the water is drawn off by the pump perfectly free from grit, and clear. Experience has shown also the advisability of other provisions which will, under certain circumstances, be



ful; and it is to meet and counteract such minor matters that the ingenuity of inventors and makers is required.

The corrosion of the driving-tube perforations by ferruginous water is provided for in such cases by a special metal. For sandy water-bearing beds strainers are provided, and in this way all the requirements of successful and enduring results are perfected. The two chief advantages of the tube wells are that they are usually and cheaply executed, and that by their use tubes all contaminations from surface



Fig. 2.—Tube Well and Pump.

water and deleterious soils are prevented. Tube wells are easily made up to 30 or 40 ft., and deliver from  $1\frac{1}{2}$  in. tubes 150 to 900 gallons, and from 3 in. tubes from 450 to 3,000 gallons per hour. By connecting a number of tube wells, supplies from 10,000 to 50,000 gallons per hour can be obtained, the quantity, of course, being in degree influenced by the nature of the water-bearing strata. Tube wells can also be driven from the bottom of dug wells to increase the supply. Where the depth to the water-bearing strata is great, borings must be made. There are two modes available for this purpose. One is by the ordinary jumping tools, and the driving down of an iron tube by heavy falling weights; the other by the diamond circular drill. In the former the strength of the driven tube is of the utmost consequence, as, if the lining tube be broken, the only remedy is to drive a smaller tube inside it, which, of course, diminishes the water supply. Messrs. Williams have adopted a peculiarly advantageous form for their lap-welded wrought-iron tubes. They are shrunk in at the ends, and screwed on the outside. The tubes are then connected by steel sockets, which, owing to the shrinkage at the joint, come almost flush with the rest of the tube. The ends are butted against each other, thus giving great strength to the whole length of the lining. Consequently there is hardly any obstruction on the outside, and the driving is not only made more easy, but the danger of splitting under the blows of "monkey" or ram is greatly diminished.

In order of novelty, the Halladay windmill comes in front of the pumps. The first important improvement over the old sails was made in the last century, when the sweeps were fitted with series of movable boards instead of sails. These series were opened or closed by an iron rod to suit the strength of the wind. This had to be done by hand; and the extent

of opening or closing either did or did not concur with the force of the breeze,—generally the latter, for seldom if ever are high winds without gusts. In the new windmill there is a remarkable scientific advance. There are no ponderous sweeps to this mill, no sails, no louver-boards. The rays or "slats" which drive the mill are all radial, and are arranged between an outer and inner circle, the inner space of the face of the mill being open and unobstructed, except by the iron radial bars which extend from the centre to the iron ring of the outer circle, and which with it constitute the frame work of the mill. The standards which carry this mill are pivoted and run on a turn-table, so that the large vane, which is attached at right angles to the mill, always keeps the face of the mill in front of the air currents—no matter how they may vary in direction. The weather-rays or slats also act automatically, and are so set or hinged as to slope away at greater and greater inclinations in accordance with the strength of the blast. In this way the greater force of the wind does not act destructively, but the mill maintains a nearly uniform power by its traverse of the varying inclinations of the slats. The opening action of these boards is directly actuated by the wind. The closing action is effected by counterweights, which bring the boards together whenever the wind slackens. Such mills are very much lighter and more effective than the old common sorts of windmills, which artists most adore in their broken-down and ruinous conditions. The new mills are not designed for pictorial delineations but for useful purposes, and range from 13 ft. diameter of fan,—giving, with wind at eighteen miles an hour, 2-horse-power,—up to 60 ft. diameter,—giving off in a like wind 40-horse-power. Such mills are applicable for water-works, corn-grinding, or machine-driving in shops and factories, or crane-hauling. They can also be used on the farm for chaff-cutting and other purposes. One of these Halladay mills is in use at the Uckfield Waterworks, in Sussex. It is erected on a timber skeleton tower 70 ft. high, and it forces water from an artesian-bored tube well for a height of 150 ft. to the reservoirs. Such pumping mills are also at work at Lechlade, in Gloucestershire, at the seat of Mr. H. Tollenmache, M.P., at Nantwich; at Kirk Hammerton Hall; at Cloghan, in Ireland; at the hospital at King's Norton; and numbers of other places. Mills of this description are being erected in London for advertisements and sign purposes.

There is one over Messrs. Williams' own works which pumps water to a height of 70 ft. and drives a lathe and drilling-machine in the upper shop. Messrs. Carwardine, of the City-road, have also just had erected a larger one, with a vane 20 ft. long by 7 ft. broad, embellished with letters 2 ft. 6 in. high—a veritable rival to the soaring "sky signs" as an advertising medium.

The pumps are the intermediate link in the service to which wells and windmills can be most frequently and to best advantage employed. Those supplied by Messrs. Williams are of good quality and high efficiency. The prominent feature in their "Curtis" double-action pump is that it consists of two barrels and only one plunger. On the up stroke the water when lifted to the top passes through a double set of valves before reaching the delivery. On the down stroke the plunger forces the water to the bottom of the first barrel, and through an aperture into the second barrel. On rising to the top of it, it passes through a second set of valves to the delivery, by these means ensuring a continuous flow of water with hardly any friction.

#### "THE RELATION OF GROUND-WATER TO DISEASE."

AT the opening meeting of the Royal Meteorological Society for the present session, Mr. Baldwin Latham, C.E., the President, delivered an address on this subject, as we briefly mentioned last week. The following is a summary of the paper:—

The pages of history show that when the ground waters of our own or other countries have arrived at a considerable degree of lowness, as evidenced by the failure of springs and the drying up of rivers, such periods have always been accompanied or followed by epidemic disease. In all probability ground-water in itself, except under conditions where it is liable to pollution, has no material effect

in producing or spreading disease. As a rule, it is only in those places in which there has been a considerable amount of impurity stored in the soil that diseases become manifest, and the most common modes by which diseases are, in all probability, disseminated, are by means of the water supplies drawn from the ground, or by the admission of ground-air into the habitations of the people. It is found that the periods of low and high water mark those epochs when certain organic changes are taking place in the impurities stored in the ground, which ultimately become the cause and lead to the spread of disease. Mr. Latham defines "ground-water" as all water found in the surface soil of the earth's crust, except such as may be in combination with the materials forming the crust of the earth. It is usually derived from rainfall, by percolation; and it is also produced by condensation. In dry countries, ground-water is principally supplied by the infiltration from rivers, as, for example, in the Delta of the Nile.

The absence of water passing into the ground for a long period naturally leads to the lowering of the free ground-water-line, and may lead to the drying of the ground above the water-line; and it is curious to note, with reference to smallpox, that the periods marking the epochs of this disease are those in which there has been a long absence of percolation, and a consequent drying of the ground preceding such epidemics. On the other hand, smallpox is unknown at such periods as when the ground has never been allowed to dry, or is receiving moisture by condensation or capillarity.

The study of underground water shows that certain diseases are more rife when waters are high in the ground, and others when the water is low. The conditions that bring about and accompany low water, however, have by far the most potential influence on health, as all low-water years are, without exception, unhealthy. As a rule, the years of high water are usually healthy, except, as often happens, when high water follows immediately upon marked low water, when on the rise of the water an unhealthy period invariably follows.

Mr. Latham has found that those districts which draw their water supplies direct from the ground are usually more subject to epidemics and disease than those districts in which the water-supply is drawn from rivers supplied from more extended areas, or from sources not liable to underground pollution. In the case of Croydon, one portion of the district (under three-fourths) is supplied with water taken direct from the ground, whilst the remaining portion is supplied with water from the river Thames. It is curious to note that even so recently as 1885 the zymotic death-rate in the districts supplied with underground water was twice as great as in that part of the district supplied from the Thames; and in this particular year 41 deaths from smallpox occurred in the district, not one of which was recorded outside the district supplied by the underground water.

Mr. Latham, in his address, dealt largely with zymotic diseases as affected by ground water, and showed that cholera ordinarily breaks out when there is the least ground water; a high air and ground temperature is also necessary for its development, and as a rule the low-lying districts are favourable to the production of these high temperatures. Smallpox is almost always preceded by a long period of dryness of the ground, as measured by the absence of percolation. Typhoid fever is most prevalent after a dry period, and when the first wetting of the ground or percolation from any cause takes place. The condition essential to the development of diphtheria is a damp state of the ground marked by extreme sensitiveness to percolation of rain. Scarlet fever follows the state of the dryness of the ground which is essential for its development, and it occurs in the percolation period. The conditions that precede smallpox are those favourable for the development of scarlet fever, and, like smallpox, the dampness of the ground for any considerable period in any particular locality, may check its development or render it less virulent, and it is most rife in low-water years. Measles are least prevalent at the low-water periods, and mostly rife at and near high-water periods. Whooping-cough follows the percolation period in its incidence, increasing with percolation, and diminishing as the waters in the ground subside. Diarrhoea is generally more prevalent in a low-water year than in other years; that is, with a very much colder temperature in a



low-water year there is a very much higher death-rate from this disease.

Mr. Latham finds that the general death-rate of a district is amenable to the state of the ground-water, years of drought and low water being always the most unhealthy.

#### THE SESSION 1891.

AMONGST the miscellaneous bills for which application is to be made are the following:

The Corporation of London: for the appointment of a public authority, by name of "The London Water Commission," to improve and regulate the supply, and diminish the cost, of water in London and adjoining places—with, if thought fit, a free supply to public baths, wash-houses, and hospitals—and for acquiring existing or future waterworks, and the right of taking water within the water-sheds of the Thames and Lee. The commission to consist of representatives of the Corporation, the London County Council, the Conservancy boards, and of other county, municipal, and local authorities.

By the Channel Bridge and Railway Company (Harbour Works): for the construction of two piers or breakwaters, 500 and 580 yards long and 440 yards apart, with subsidiary works, at St. Margaret's Bay, a pleasant retreat at foot of an opening in the cliff near to the South Foreland.

By the Gas Light and Coke Company: for further powers to more readily recover for consumption of gas, and for authority to enter premises in order to cut off the supply, and thus avoid, as far as possible, the breaking up of streets and roads for that purpose, together with enforcement of penalties for resistance against such lawful entry.

The "Trustees and Guardians of Shakespeare's Birthplace" will ask for enlarged powers to deal more satisfactorily with their accumulated capital than, as they are advised, the terms of their existing trust deed now permit. They seek for a conveyance to them of the property in Henley-street and elsewhere, at present vested in the Stratford-on-Avon Corporation, together with the Library and Museum. The site has been preserved of Sir Hugh Clopton's "Great House," more commonly known as "New Place," which, having been rebuilt, was, together with the mulberry tree, ruthlessly pulled down in 1759 by Francis Gastrell, vicar of Frodsham, to escape annoyance by visitors: some remains of the cellars and foundations are shown there. The house in Henley-street was restored by Mr. Edward Barry, architect, and the earliest extant drawings of the building were followed. The trustees further seek to purchase, as opportunity may offer, Mary Arden's house at Wilmcote, and Ann Hathaway's cottage at Shottery. Shakespeare demised a life interest in the house of his birth to his second sister Joan. Its subsequent history is traced in the late Mr. Halliwell-Phillips' "Outlines," appendix to vol. i. It was bought, in 1847, for 3,000l.

Notice has been given for a Bill to change the constitution of the master, wardens, and commonalty of the watermen and lightermen of the Thames, known as the Watermen's Company, and, if necessary, to dissolve the Corporation and distribute its property. The Bill proposes to make radical changes as touching the examination and licensing of lightermen and watermen employed on the river between Lower Hope Point, near to Gravesend, and Teddington Lock, and to repeal or modify certain existing tolls, rates, exemptions, and rights of ferry.

#### LECTURES ON HOMERIC GREECE.

V. AND VI.

IN his fifth lecture, \* Dr. Leaf dealt with the question of Homeric art. The Homeric poems yield us evidence respecting the sources of art, its subject, and the processes of technique, but no description can enable us adequately to judge of style, by which alone the development of art can be traced. Moreover, the Homeric record is deficient as regards many branches of art respecting which we should have been glad of material for comparison with the monuments,—notably pottery, engraved gems, terra-cottas, and wall-painting. The importance of Phœnician influence had, Dr. Leaf thought, been overrated. He showed, however, though with only partial acceptance, Mr. Murray's re-

\* For brief reports of the previous lectures see pp. 303, 345, 405, ante.

storation of the Shield of Achilles, and noted especially the courses of cyanos. Lapis lazuli was rare then as now, and this cyanos was no doubt used as a substitute: it still remained a puzzle as to how exactly the courses were laid. A subject of more immediate interest is the evidence as to the existence previous to and contemporary with the conventionalised Oriental style of a more naturalistic type of art, as shown in the wall-painting of Tiryns, and still more noticeable in the Vaphio cups. As to the famous man and bull of Tiryns, Dr. Leaf rejected any attempt at mythological interpretation, and held, as we believe most archaeologists now do hold, that the scene was, like those in the Vaphio cups, one from daily life,—a bull capture. Very fine reproductions of the Vaphio cups were shown on the screen, and fully discussed.

The last (sixth) lecture dealt with the question of the steps by which Homeric developed into Classical Greece. Homeric Greece was later, according to Dr. Leaf, than the civilisation of Mycene. Iron, for example, in Homer is freely used, not, indeed, for weapons, but for tools. None is found at Mycene, though, as the lecturer warned his audience, it might have been present, and have disappeared through rust. Again, the remains of Hissarlik and Mycene are of wholly different epochs, whereas Homer represents Greek and Trojan as in the like stage of civilisation; but it must be remembered he is avowedly narrating events of an elder world. On the whole, recent excavations went to show that however poetical and imaginary the story of it might be the war was a real one. Dr. Leaf alluded to the theory,—now, let us hope, finally exploded, but once widely popular,—that the Trojan heroes were (solar) mythological persons. He noted, in opposition to this, the interesting fact that in the early kernel of the poem, the "Wrath," the gods play but a small and episodic part, in the later portions they are essential actors; this does not look like mythological origin. Setting aside the question of the relative ages of the Mycene remains, and the poems they have thus in common, that both evidently stand at the end of a long civilisation abruptly brought to a close. In the poems the tribal names are those of the Achæans, Argives, Danaans, when history dawns these have disappeared, we find instead Æolians, Ionians, Dorians,—the great question is, how came all this about. Of the Dorians we know that they were a mountain race pushed south and westward, and, entering the Peloponnese from the west, where they crowded out the Achæans. The Achæans crossed to Attica and over the Ægean Sea; there in the north they became Æolians. The south, as had been seen in the first lecture, was mainly Dorian. Midway came the Ionians,—the most puzzling of all the races, and yet the most important, because, when history dawned, we find them in possession of the Homeric poems, written in their dialect. Briefly, Dr. Leaf concluded, and the conclusion is of vital interest both for history and mythology, that the Ionians are the *Pelagians* *Hellenised by the Achæans*. The ancient, effete, aristocratic civilisation of the Achæans fell before the incoming Dorians, the hardy mountaineers, but the old, autochthonous Pelagians, with their primitive habits and their chthonic cults, were strong to maintain themselves anew when the war had broken and past. The far-reaching consequences, if interesting now,—especially for mythology,—cannot be discussed here. A hearty vote of thanks to Dr. Leaf for his interesting lecture was accorded at the close. The subject of Homeric mythology was taken up by Miss Harrison on Wednesday. We shall give a short *résumé* of Miss Harrison's four lectures at the close of the course.

#### ARCHITECTURAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—A meeting of this Association was held at the Midland Institute on Tuesday evening last, and was attended by a good number of members, the President, Mr. T. Naden, being in the chair. As it was the opening meeting of the session, some formal business was transacted at the commencement, during which Mr. Herbert B. Lloyd, hon. sec., stated that the classwork of the session had made a better start than had been the case for some years, and that there was every prospect of the session being in every way a success. The business was followed by a paper on "Architectural

Drawing," read by the Vice-President, Mr. W. Hawley Lloyd, in which he laid emphasis on the fact that architectural drawings should not be regarded as pictures, whether they were drawings of new or studies of old buildings, and that in either case their use should be borne in mind, and they should be made to accurately and truthfully show the building as it existed. The author deprecated the making of pretty sketches in place of definite studies of old work, and quoted the drawings of Sir Christopher Wren, instancing his studies of the domes of Florence and St. Peter's at Rome, as splendid examples of what such drawings should be. With regard to working drawings, Mr. Lloyd said that it should be borne in mind that it was a more difficult thing for a workman to interpret a drawing than for the man who had made it to do so, and that it was undesirable to do anything likely to lead to the mystification of the workmen, such as the drawing of details across one another. Mr. Lloyd further said that he considered all architects should, in making perspective drawings of their buildings, avoid the introduction of effects, such as the weather-stains, lichens, and mosses of centuries, as being untruthful; and he protested against the perspectives often seen, which, whilst clever in themselves and as drawings, represented as old and weather-worn a building which for years would keep the spick-and-span appearance in which it left the builder's hands. The paper was illustrated by many fine drawings by Messrs. J. F. and A. E. Barnsley, W. H. Bidlake, Herbert Raiton, A. B. Mitchell, C. E. Mallows, and others, many of them kindly lent for the occasion. A discussion followed in which Messrs. J. Cotton, W. H. Bidlake, W. Henman, C. E. Bateman, and others took part, and in the course of which the President and others of the speakers congratulated the Association on the change by which the use of the Institute room had been secured for the meetings.

MANCHESTER ARCHITECTURAL ASSOCIATION.—The last ordinary meeting was held at the Athenæum on the 19th inst. (Mr. A. H. Davies Colley in the chair), when the members of the "Association of the Manchester Students of the Institute of Civil Engineers" were present. Mr. S. S. Plaf, A.M. Inst. C.E., read a paper entitled "Notes on Paving Stones used at Rochdale," illustrated by special arrangement of lantern, showing microscopic sections of the several stones under polarised light. A vote of thanks, proposed by Mr. J. S. Hodgson, seconded by Mr. Greatorex, and supported by the chairman, terminated the meeting.

MANCHESTER SOCIETY OF ARCHITECTS.—The annual dinner of this Society took place on the 19th inst., at the "Queen's Hotel." Mr. A. Waterhouse, R.A., President of the Royal Institute of British Architects, the Dean of Manchester, Mr. Woolner, R.A., Mr. Chadwick, President of the Manchester Architectural Association, and Mr. J. H. P. Leresche were present as guests.

ARCHITECTURAL ASSOCIATION (LONDON).—At the meeting of the Advanced Class of Construction and Practice on Wednesday evening last, the discussion on Mr. Francis Hooper's paper, read at the last meeting, on "Artisans' Dwellings," was resumed. Dr. Shirley F. Murphy (Medical Officer to the London County Council), Mr. P. Gordon Smith (Architect to the Local Government Board), and Messrs. Keith D. Young, Henry W. Dobb, J. Barry O'Callaghan, and G. N. Hooper took part, in addition to members of the class. The remarks elicited were of the most practical character, and cordial votes of thanks were passed to the reader of the paper and the special visitors.

#### COMPETITIONS.

THE LONDON COUNTY COUNCIL'S PROPOSED MUNICIPAL LODGING-HOUSE FOR 320 MEN.—In this competition, we are informed that seventy-five designs have been received; and the drawings are now being arranged for the inspection of the Assessors, Mr. Ewan Christian, and the Architect to the Council.

THE COUNTRY HOUSE. (WHAT OUR ARCHITECT HAS TO PUT UP WITH.)—Fair client: "I want it to be nice and baronial, Queen Anne and Elizabethan, and all that; kind of quaint and Nuremberg, you know—regular Old English, with French windows opening to the lawn, and Venetian blinds, and sort of Swiss balconies, and a loggia. But I'm sure you know what I mean!"—*Punch*.



## ARCHEOLOGICAL SOCIETIES.

**BRITISH ARCHEOLOGICAL ASSOCIATION.**—At the meeting of this Association on the 19th inst., Mr. G. W. Grover, F.S.A., in the chair, the Rev. Carus V. Collier announced the discovery of a vase of glazed ware, filled with Roman coins, at Shipley, during the construction of the railway there, and he exhibited some of the best-preserved examples. These are of Valentinian, Tetricus, etc. The hoard was taken possession of by the workmen, and but few of the coins have been recovered. Mr. C. Brown, Mayor of Chester, sent for exhibition some photographs of the remarkable Roman column which was found *in situ*, during some recent building works on his property in Westgate-street. The column has never been preserved on the spot where found, by the construction of an arch over it to carry the new building. The Rev. C. G. R. Birch reported the discovery of a beautiful brass, during the restoration of Heddy Church, Lincolnshire, where it was found beneath the floor. It represents a female figure, in the costume of the fourteenth century. A reproduction of a rubbing, made by Mr. Birch, was exhibited. The first paper read was "On the Copied Stones of Cornwall," by Mr. A. G. Langdon. After remarking that ancient sepulchral monuments of the form of an inverted boat had not previously been observed in Cornwall, although other examples were known in the North of England, and one or two in Wales, the lecturer proceeded to point out, by the aid of some beautiful drawings, and of fully-sized rubbings, the peculiarities of the examples cited, which are three in number, respectively at St. Tudy, Lanivitt, and St. Buryan, the latter being a fragment only. They are worked in granite, and are covered with interlaced and key patterns of pre-Norman date, agreeing in style with other examples of interlaced work on the Cornish crosses. The second paper was by Mr. Russell Forbes, of Rome, read in the author's absence, by Mr. de Gray Birch, F.S.A. It was on a charm against "The Evil Eye," which is depicted on a tessellated pavement of great beauty recently found at Rome, in an owl, representing "The Evil Eye," is surrounded by other animals representative of protecting deities.

**GLASGOW ARCHEOLOGICAL SOCIETY.**—The annual meeting of the Glasgow Archeological Society was held in the Society's Rooms, Bath-street, on the 21st inst. Mr. J. Honeyman, President, occupied the chair. The report by the Council showed that the number of members admitted in 1889-90 was thirty-four, as against thirty-three last year. The Society had sustained the loss during the past year of two distinguished honorary members, viz. Mr. John Layton, F.S.A., and Mr. C. Roach Smith, F.S.A., and of several ordinary members, including the Earl of Glasgow and Mr. John Larrick, City Architect. The present membership, after deducting deaths and resignations, was nine honorary and 310 ordinary members. Messrs. William Wilson, A. M. Scott, A. B. McGregor, and J. O. Mitchell retired at this time from the Council. It was recommended that Messrs. Scott and Mitchell be re-elected, and that Professor Storey, D.D., and Robert Guy should be elected as new members of Council. The Council further recommended the re-election of Professor Ferguson, LL.D.; Mr. C. D. Donald, F.S.A. Scot.; and Dr. Murray, as Vice-Presidents; of Mr. Dalrymple Duncan and Mr. Black, as hon. secretaries; and of Mr. Marwick as hon. treasurer; and the re-appointment (pending reorganisation) of the Society's committees. The financial statement showed that there was a balance in hand at present of 222l. 9s. 6d. The Chairman, in moving the adoption of the report, said that there was still room for the Society to grow in Glasgow. He was glad to see that the funds were larger this year, and that would enable them to use more money in the way of publication than formerly. The Society of Antiquaries in Glasgow were engaged in a work which would be facilitated by the co-operation of other societies, and by individual members, namely, a complete illustration of all the sculptured stones in Scotland. The report was adopted. The Most Rev. Archbishop of York, D.D., afterwards addressed the Society on "The Episcopal Seals of Glasgow."

**ELECTRIC LIGHTING AT CARDIFF.**—The Cardiff Corporation have given notice of their intention to apply to the Board of Trade before December 21 next for a Provisional Order under the Electric Lighting Act, 1882 and 1885, to enable them to light the principal streets of the town with electricity.

## THE SURVEYORS' INSTITUTION.

The following gentlemen have been reported by the scrutineers as elected to various classes of membership, at the ballot of Saturday, November 22, 1890:—

*As Fellows*—Stephen Bailey, Nynehead, Wellington, Somerset; Robert Buck Broster, Keighley; George Buckley, Halifax; Henry Philip Chalk, Linton, Cambs.; William Clarkson, Poplar, E.; George Radcliffe Cobham, Gravesend; Samuel Hird Cowper Coles, Crickhowell; Brian Ballou Hird Cowgill, Bradford; Henry Brook Dransfield, Huddersfield; Edward Fillingham, Hull; George William Finn, Faversham; Thomas Hills Forey, Newcastle-upon-Tyne; Edwin Fox, jun., Gresham-street; Arthur Richard Gradwell, Blackburn; Thomas Thornton Green, Poultry; William Benjamin Hedditch, South Petherton, Somerset; Isaac Matthews Jones, Chester; John Kidwell, Rochester, Kent; Edward Osmond, Upton Pyne, Devon; William Henry Parker, Worcester; William Parkin, Bathurst; Albert Woodward Parry, Reading; Frederick Cecil Parsons, Brighton; Frederick Atkinson Powell, Kennington-road; Arthur Stirling Prindmore, Junction-road; Peter Purves, Huntingdon; Henry Adair Rawlins, Queen Victoria-street; Ethel Trebarnes Rees, Cardiff; Richard George Scriven, Castle Ashby, Leicestershire; William Scroggs, Kidlington, Oxford; Harry Samuel Senior, Sturminster Newton, Dorset; Harry Russell Smith, Bradford; Edward Tidman, Victoria-street, S.W.; Joseph Harington Turner, Kilmarock; Edward James Turtlo, Horkstow, Barton-on-Humber; John Allen Wadlington, Bayford, Hertford; Francis H. Walker, Albert Meller Walsh, Macclesfield; Herbert Fuller Waring, Maidstone; Herbert Walter Williams, Norwich; Stephen Woodbridge, jun., Brentford; Lionel Burnet Woodforde, Theford, Norfolk; William Booth Woodhead, Bradford; and Robert Walter Wordsworth, Whitmore, Nottinghamshire.

*As Professional Associates*.—Francis Reginald Arnytage, Pump-court, Temple; Cecil Hugh Aylen, New Broad-street; Frederick Herbert Bancroft, Manchester; Thomas Barclay, Birmingham; Maurice Frederick Beadel, Gresham-street; Arthur Body, Clippenham; Frederick Edward Boulton, Mornington-road, N.W.; Frederick Henry Brackett, Chesapeake; George William Cobham, Gravesend; Frank Minshall Elgood, Wimpole-street; Francis Ellis, jun., Trafford-park, Patricroft, near Manchester; William Forrest, Penarth; Arthur Norman Garrard, Cannon-street; Alexander Goddard, Leicester; Alexander Ernest Green, Exling; James Henry Hodgkinson, Stalybridge; Gilbert Plantagenet Mitchell, Innes, Chester; Walter Robert Kay, Bury, Lancs.; Graham Harry Mould, Thornton Heath, Surrey; George Osenton, jun., Mount-street; Edward John Partridge, Fleet-street, E.C.; Joseph Perkins, Edgbaston, Birmingham; Richmond Pinder, Upper Baker-street; Herbert Edward Prall, Dartford, Kent; Frank J. Ruddle, Spring-gardens, S.W.; Edwin Savill, New Broad-street, E.C.; Charles Frederick Slater, Richmond, Surrey; James Frederick Kemp Smith, Market Harborough; Walter Wadman, Seacombe, Wirral; William Witton Rix, Spalding, Norfolk; Ernest George Verity, Gray's-in-square; Hugh Cathrop Webster, Gresham-street; and Charles Bruce Wood, Irone-road, Parson's Green.

*As Associates*.—Mr. Reginald Ward, Solicitor to the London County Council, Spring-gardens, S.W.; and Mr. John Wrightson, College of Agriculture, Downton, Wilts.

At the ordinary general meeting of the Institution held on Monday evening last, Mr. T. A. Dickson (Fellow) read a paper on "The Labour Question as Regards Agriculture."

## THE LONDON COUNTY COUNCIL.

The usual weekly meeting of this Council was held on Tuesday last, Sir John Lubbock in the chair. After the confirmation of the minutes, a vote of condolence with the late Chairman, Lord Rosebery, in his sad bereavement, was unanimously assented to by all the members rising in their places.

*Resignation of the Solicitor.*—The Standing Committee reported that the Chairman of the Council had received a letter from Mr. Reginald Ward, the Solicitor, resigning his office, on the ground of failing health, and asking to be allowed to do so under the provisions of the Superannuation Act. Mr. Clarke (Chairman of the Improvements Committee), Mr. Hutton (Chairman of the Building Act Committee), and Mr. Charles Harrison (Chairman of the Parliamentary Committee), having spoken of Mr. Ward's long services, and of his ability and

courtesy, it was resolved to "accept the resignation with regret," and it was referred to the new General Purposes Committee to consider the question of pension.

*Tenders and Conditions of Contract.*—The first paragraph of the Report of the Main Drainage Committee was as follows:—

"The Council, in September last, issued an advertisement inviting tenders for engines, boilers and machinery, to be erected at the Crossness Outfall Works. The tenders were to be received by the Council on October 21, and would in the ordinary course have been referred to us. No tender, however, was sent in, although four firms had applied for copies of the plans and specification. We had a letter from Messrs. James Watt & Co., stating that they were unable to send in a tender for the work, as, having regard to their engagements, the time named for the completion, six months, precluded them from undertaking such a contract. After conferring with the Engineer, we determined to re-advertise the work, and in doing so, to extend the time allowed for the completion of the contract from six months to nine months. We also decided to modify the clause in the specification providing that the contract should not be assigned or underlet, by inserting the words 'or make a sub-contract,' and the words 'without the previous consent of the Council,' and omitting the following words:—'Nor shall the contractor make a sub-contract with any workman or workmen for the execution of any part of the cast-iron, wrought-iron, or other metal-work, timber, brick-work, concrete, ground-work, masonry, or any other work appertaining to this contract, but . . . to employ . . . own workmen for the labour thereof, who are to be paid directly by the contractor.' We believe that, in the adoption of that course, we acted within the powers conferred upon us by the Council; but having regard to the decision of the Council on Tuesday last, upon the report of the Special Committee on Contracts, we think it desirable to report the above circumstances for the information of the Council, and we accordingly do so."

The report was received.

*Bishop's-meadow, Fulham.*—The Parks Committee and the Improvements Committee each presented reports on this subject. The Report of the Parks Committee was as follows:—

"On October 28 last, we reported to the following effect, viz. :—

"On May 25, 1889, the Vestry of Fulham informed the Council that the Ecclesiastical Commissioners were willing to give this twelve acres of land, which adjoins the Bishop of London's Palace at Fulham, as a recreation-ground, and the Vestry asked the Council to lay out the land and build a wall along the portion of it known as the Bishop's-meadow, which lies between the palace grounds and the Thames. The question of the river-wall we deemed to be one for the consideration of the Improvements Committee, who might at some future date have to deal with the embankment of the Thames generally at this point, and we accordingly referred the matter to them, and they are reporting on it to the Council. Meanwhile, we have gone into the question of laying out the grounds, and have applied to the Vestry in order to ascertain whether they would contribute to the cost. This they have agreed to do to the extent of 1,000l., the total outlay being estimated at 2,500l. We are also prepared, with the concurrence of the Ecclesiastical Commissioners, to convey the lease of Bishop's-meadow (5 acres) to the Council, and the Commissioners will transfer to the Council direct the lease of the West-meadow (7 acres). The leases are both for 999 years, and the two meadows form the recreation-ground of 12 acres. We have visited the locality on more than one occasion, and are fully impressed with the public advantage which will accrue by securing the property. We may add that the conditions attached to the gift are that a river-wall shall be built, and that the ground shall be laid out and maintained by the Council as a public recreation-ground,

and we recommended that, subject to an estimate being submitted to it by the Finance Committee as required by the Statute, the Council should authorise an expenditure of 1,500l. for the laying-out of Bishop's-meadow and the West-meadow, Fulham, as a public recreation-ground, to be maintained by the Council in perpetuity. The Council referred this recommendation back to us for the Valuer to report as to the value of the land offered as an open space conditionally. The Valuer's report is to the effect that, subject to the above-named conditions, he does not see that any greater advantage attaches to the land. If sold free from restriction, he states that it would be worth 750l. per acre, or 9,000l. for the whole. Taking into consideration the facts that sooner or later an embankment will have to be constructed, and that owing to the rapid increase in building, the necessity for open spaces in Fulham is becoming greater every year, we are of opinion that the Council should accept the gift, and we repeat our recommendation, viz.—

"That, subject to an estimate being submitted to it by the Finance Committee, as required by the Statute, the Council do authorise an expenditure of 1,500l. for the laying-out of Bishop's-meadow and the West-meadow, Fulham, as a public recreation-ground, to be maintained by the Council in perpetuity."

\* See Builder for November 15, p. 385, and No. vember 22 p. 408.

\* All having passed the qualifying examination.



The Improvements Committee's Report on the same subject was as follows:—

"On July 26, 1889, the Parks Committee referred to us the question of the construction of a river wall on the southern side of Bishop's-meadow, Fulham, which was proposed to be laid out as a public recreation-ground. On January 29 last we advised the Parks Committee as to the description of wall which we would recommend. On February 21 last, however, the Parks Committee informed us that in its opinion the formation of the wall should be carried out as a Metropolitan improvement, and should therefore be dealt with by us, upon which we suggested that the Parks Committee should take up a report to the Council dealing with the laying out of the land, so that instructions might be given by the Council, if it were considered desirable, for us to proceed further in the matter. But the Parks Committee now asks us to submit a report dealing with the river wall, and states that it will at the same time report upon the question of laying out the land. Having carefully considered the subject and viewed the locality, we are of opinion that, if the Council resolves to acquire and lay out the land at Bishop's-meadow as an open space, the erection of the river wall will be indispensable. We consider that the wall should be constructed of concrete blocks, so that in the event of the Council at some distant date deciding to embank the river with a similar wall up to this point, there may be some uniformity of appearance. The estimate for building the wall with concrete blocks is 8,800*l.* We recommend—

"That, subject to an estimate being submitted by the Finance Committee and approved by the Council as required by the Statute, and subject to the Council agreeing to acquire and lay out the land as an open space, the Council do seek powers in the next session of Parliament to construct an embankment wall at Bishop's-meadow, Fulham, such wall to be formed with concrete blocks and with a curved batter to the face."

After a long discussion, in the course of which Col. Edis, Mr. Roberts, and Mr. Burns strongly condemned the proposed use of concrete blocks for facing the proposed embankment wall, the Parks Committee's report was adopted, but the Improvements Committee's report was referred back for further consideration.

After transacting other business, the Council adjourned.

### Illustrations.

#### THE CHATEAU DE MAINTENON.

**I**N his work entitled "Days near Paris," which was reviewed in the *Builder* some time since, Mr. Augustus Hare completely forgot the existence of the Chateau of Maintenon, which is one of the most beautiful works of French architecture of the sixteenth century. We supplied the deficiency briefly in the article in question, but our readers may be glad to have a further account and illustration of this picturesque building.

Maintenon is a small town on the Eure, about 69 kilometres from Paris by the Bretagne railway. The chateau, which is still the property of the Noailles family, has held many illustrious guests. The "Grand Monarque" himself was there several times; Racine stayed there for some time, and composed there for the ladies of St. Cyr, his two tragedies of "Esther" and "Athalie."

The chateau, "restored" some years ago, was built by Jean Cottureau, treasurer of finance to Louis XI., Charles VIII., Louis XII., and Francis I., and whose daughter married in 1526, Jean d'Angennes, lord of Rambouillet. From the d'Angennes family the property passed into the hands of the Marquis de Villeray, who sold it to Louis XIV. in 1674, who made a present of it to Françoise d'Aubigny, Marquise de Maintenon, his wife by a morganatic marriage. She gave it as a wedding gift to her niece on the marriage of the latter with the Duc d'Ayen, son of the Maréchal de Noailles, ancestor of its present possessor.

The situation of the chateau is beautiful. There is a fine park round it, of which the gardens were laid out by Le Nôtre. Two rivers, the Voise and the Eure, as well as numerous canals, divide the meadows, which are connected by about thirty bridges at different points.

The chateau itself forms a picturesque irregular mass of buildings, the effect of which is heightened by the fine warm colouring of the brickwork. The arms of the founder, Jean Cottureau, are still to be seen on the turrets flanking the entrance-gate. Internally there is to be noted a pretty chapel with some fine sixteenth-century windows representing the scenes of the Passion. One façade, with a *cour d'honneur* before it, looks towards the principal square of the town; the other, which has been shown, is the principal façade towards

the park side, which in the general view from gardens, also given, is nearly lost behind the projecting wing. The park façade is by far the most interesting in its details, although perhaps in another sense the one towards the town would be more correctly called the principal façade. The wing which extends between the large square tower on the left, and the entrance gateway, was built by Madame de Maintenon, who built also the right wing, containing a fine gallery which the present Duc de Noailles has had splendidly decorated. This gallery contains the portraits of all the known members of that family since the crusades. The apartments commonly occupied by Madame de Maintenon herself are among the sights of the building, and still contain much of their ancient furniture and hangings, as also her portrait by Mignard.

#### UNITED METHODIST FREE CHURCH, MANOR PARK, ESSEX.

This church, now being erected, consists of a nave and aisles, 40 ft. across, intersected by aisled transepts of equal height and width. Seating is provided upon the ground-floor for 475 people, the seats themselves radiating in the large square formed by the junction of nave and transepts, so that all the congregation look directly to the pulpit, placed in the centre of the building.

The communion platform will have choir seats on either side, and behind the pulpit is the organ chamber, carried up to the full height of the church. There are two large vestries, under one of which is the heating chamber.

The turret and porch on the opposite side lead into a lobby extending the whole width of the building. Materials—red bricks, Bath stone, green slates, and lead for flats and spirelet. The contractor is Mr. H. J. Carter, of Grays, Essex; and the building is being carried out from the designs and under the superintendence of Messrs. Potts, Sulman, & Hennings, of London, their designs having been chosen in a limited competition.

#### INTERIOR ST. BARTHOLOMEW THE GREAT, SMITHFIELD.

This interior view, from a small oil-painting executed by Mr. W. D. West, shows one bay of the Norman arcade on the south side of the church. It may be of interest to some of our readers to have an illustration of one of the few pieces of Norman architecture remaining in London.

#### ST. IVES BRIDGE CHAPEL.

IN continuation of the illustrations of bridge-chapels (Wakefield and Rotherham) which we published last week, we now illustrate the one at St. Ives, Huntingdonshire. The bridge is about 14 ft. wide, with triangular recesses at intervals over the piers. The chapel was about the same size as that at Rotherham—the front measures 13 ft. in width. It differs in plan from the other two, having an apsidal termination eastward. The original parapet has been removed, and a modern brick house of two stories has been built over it, following the outline of the chapel. The height to the string-course which formed the lower member of the parapet is 5 ft. above the parapet of the bridge. The house is now used as offices, and modern windows are inserted. There are traces of a gable against the east wall, but whether original or a mark of a later building it is difficult to say. The bridge itself is an interesting example, and near it are some good houses of later date.

Both the chapels at Rotherham and St. Ives are of the fifteenth century.

#### OAK CHEST, BRANCEPETH CHURCH.

THIS finely-carved chest is of fourteenth-century work, probably Flemish. The carving is clean and sharp, cut to about the same depth as the tracery, about a half-inch sinking. The panels at the ends are plain, but those of the lid are stop-chamfered. The lock-plate is modern. Brancepeth Church, in which the chest is kept, is about five miles from Durham. The illustration is from a drawing by Mr. W. G. Footitt.

#### "THE HUT," HATCH END, PINNER.

"The Hut" is from the designs of Mr. James Ransome, and has been built for Lady Watkin Williams on a picturesque site about two miles from the village of Pinner. The

lower part of the building is in red brick, the mullions and transoms of the windows being of wood painted white. Above the first-floor level the walls are of timber construction, with black-tarred posts and light-yellow distempered rough-cast. The roof is hung with red tiles. The house consists of three reception-rooms on the ground-floor, all approached from the hall, and opening on to the loggia, which faces south; seven bedrooms, a small boudoir, and the usual offices, bath-room, &c. The panelled dado in the drawing-room is of wood painted white, and is 3 ft. 6 in. high. Above this level the walls are hung with a dark "tapestry paper." At one end of the room a large arched recess has been formed for the accommodation of a grand piano. The building of "The Hut" was completed some eighteen months since, Mr. Batchelor, of High-street, Harrow, being the contractor.

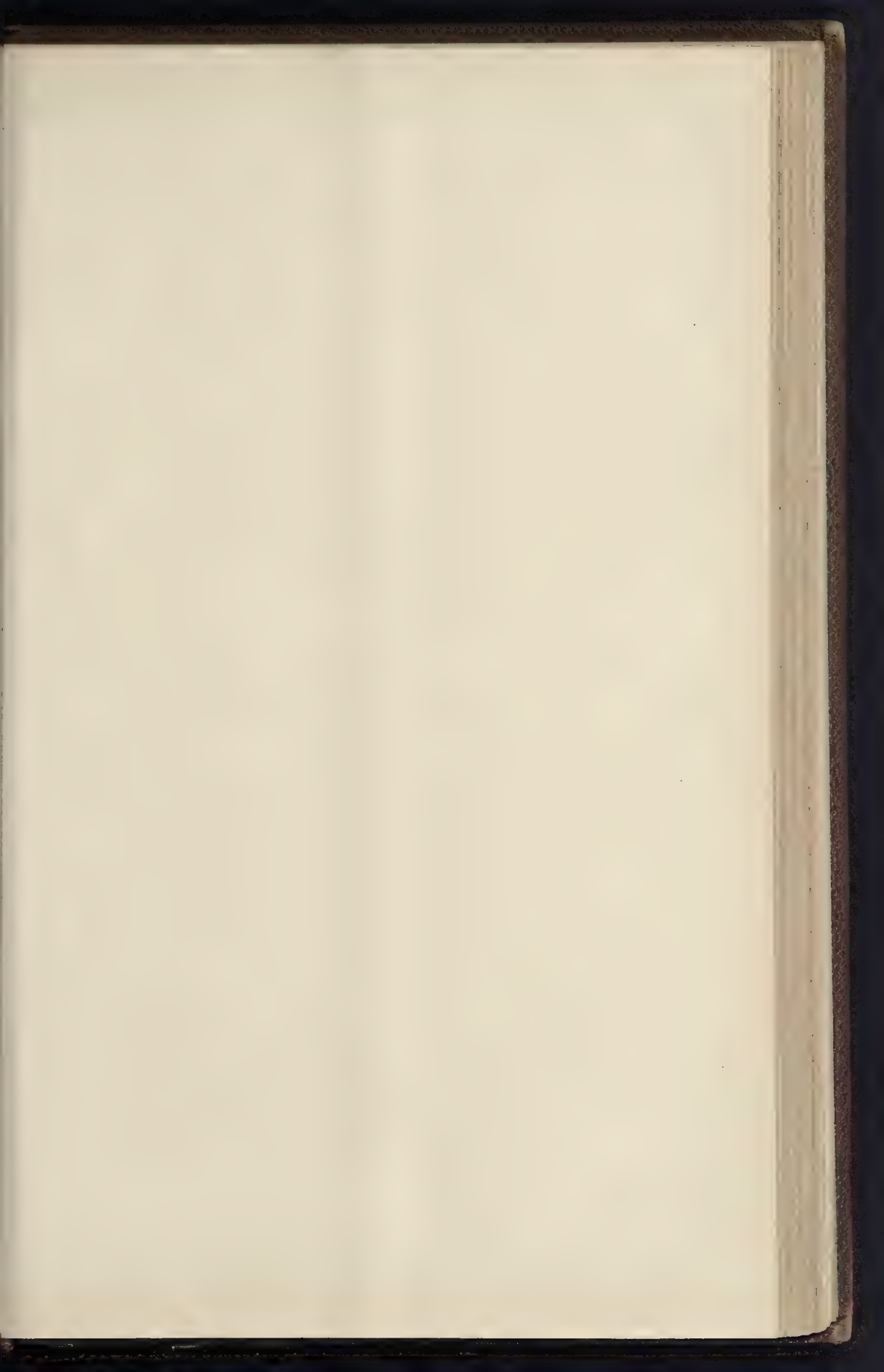
### Books.

*Murray's Handbook for Durham and Northumberland.* London: John Murray, Albemarle-street. 1890.

At the risk of appearing ungracious, we may point out the omission of a few facts in the revised edition of Murray's really good handbook relating to Durham and Northumberland, which should be rectified in the next issue; and likewise call attention to a few incorrect statements that it will be well to put right when the same occasion arrives. It is, in the main, an excellent handbook, all the same, full of matter, light to hold, and easy to read; and as it is furnished with two good maps, deposited in two pockets in the cover, it is a very desirable item in the equipment of a traveller in the part of the kingdom to which it refers.

It must be premised that the plan of the work is a series of excursions, and that it is only the places within easy distance of these routes that are mentioned. By this arrangement several very interesting buildings are omitted altogether. Woodhorn Church is one of these. This is an ancient church of Saxon foundation, with Saxon fragments in it, and additions of nearly every subsequent century; and it is within a very short walk of Newbigen Church, of which a brief description is given. Duddo Church is another omission, though the village is mentioned. Byrness Church, the smallest in the archdeaconry of Lindisfarne, has no word, though Byrness has four lines of notice of Door Tarn in a chasm in a cliff two miles away. Ilderton Church is not mentioned, though a mausoleum in the churchyard has a line. Anroft Church, which has the singular feature of a fortified Plantagenet tower built on the walls of a Norman nave (shown in a view in the *Builder* some time ago), is accorded only with a tower attached to the church for the residence of the curate and the protection of the villagers from the inroads of the Scots. The rare beacon-turret at the south-east angle of Alnwick Church is slightly alluded to as an Italian turret (whatever that may mean); and the other numerous instances of fortified church towers are not specially pointed out. They are, however, the special features of border architecture. They stand like sentinels guarding the borderland, and form, with the flat towers and mighty castles, a defence of the first importance. One example, at Edlingham, has its fastenings on the side approached from the nave of the church, which proves it was, at some time, used as a place of detention as well. The mention of Edlingham is an opportunity to correct the statement that there are "some interesting chimney-pieces, doorways, &c." in Edlingham Castle. The edifice has been in reality a fine pele tower, with a winding stone stair. The principal chamber was groined with arches springing from corbels in the angles which intersected each other. It is now in ruins, open to the sky. There is but one fireplace, which is now falling to pieces, with a lintel formed of ten stones joggled together with alternate straight and semi-circular joggles, which has been delineated in Parker's Glossary. To pass to another Castle, it may be remarked there is an interesting fact about Bamborough Castle that has not been touched upon. Malory, in the *Morte d'Arthur*, says Sir Lancelot desired the Bishop of Canterbury to see that he was buried in Joyous Gard, according to a vow he had made, and states, parenthetically, "Some men say Alnwick, some men say Bam-

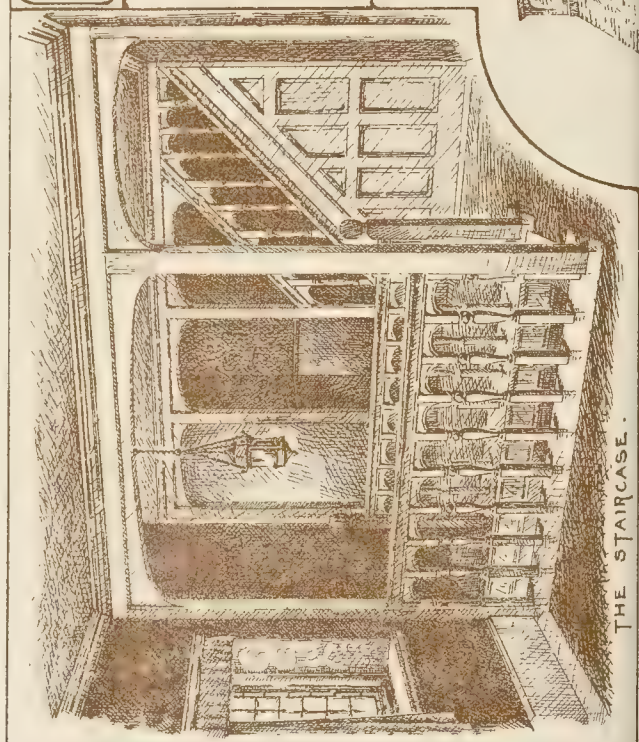




'THE HUT', HATCH END, PINNER.  
for LADY WATKIN WILLIAMS.  
JAMES RANSOME, ARCHITECT.

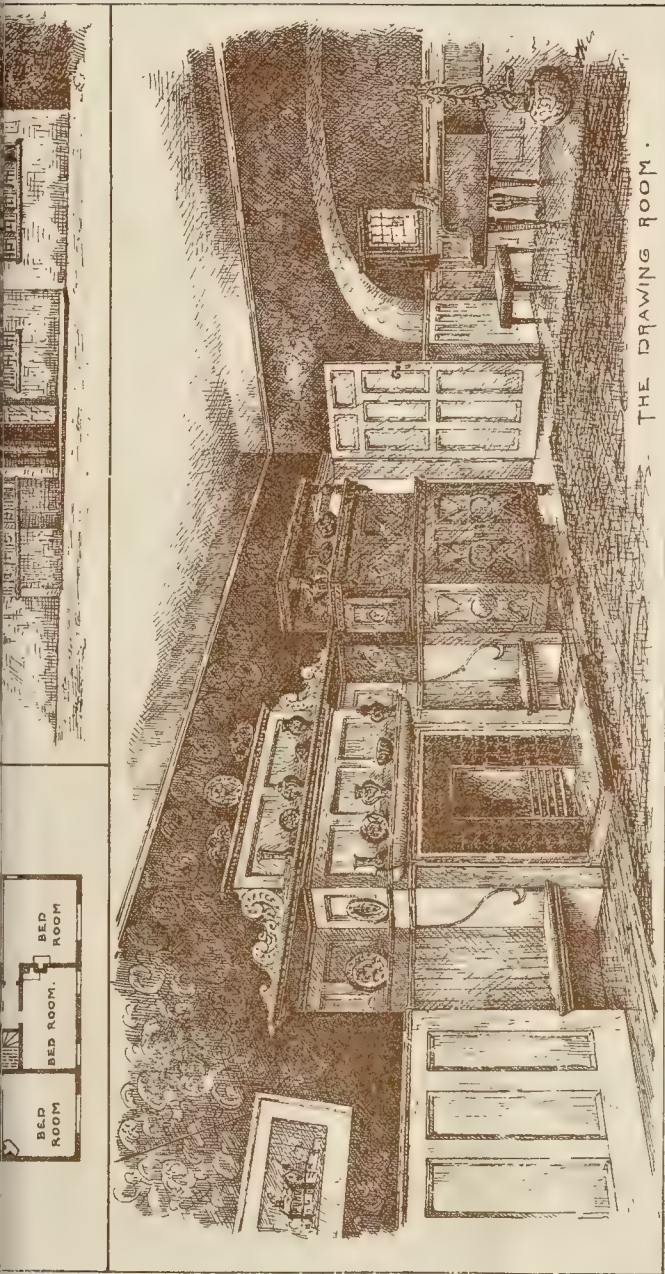


SOUTH FRONT.



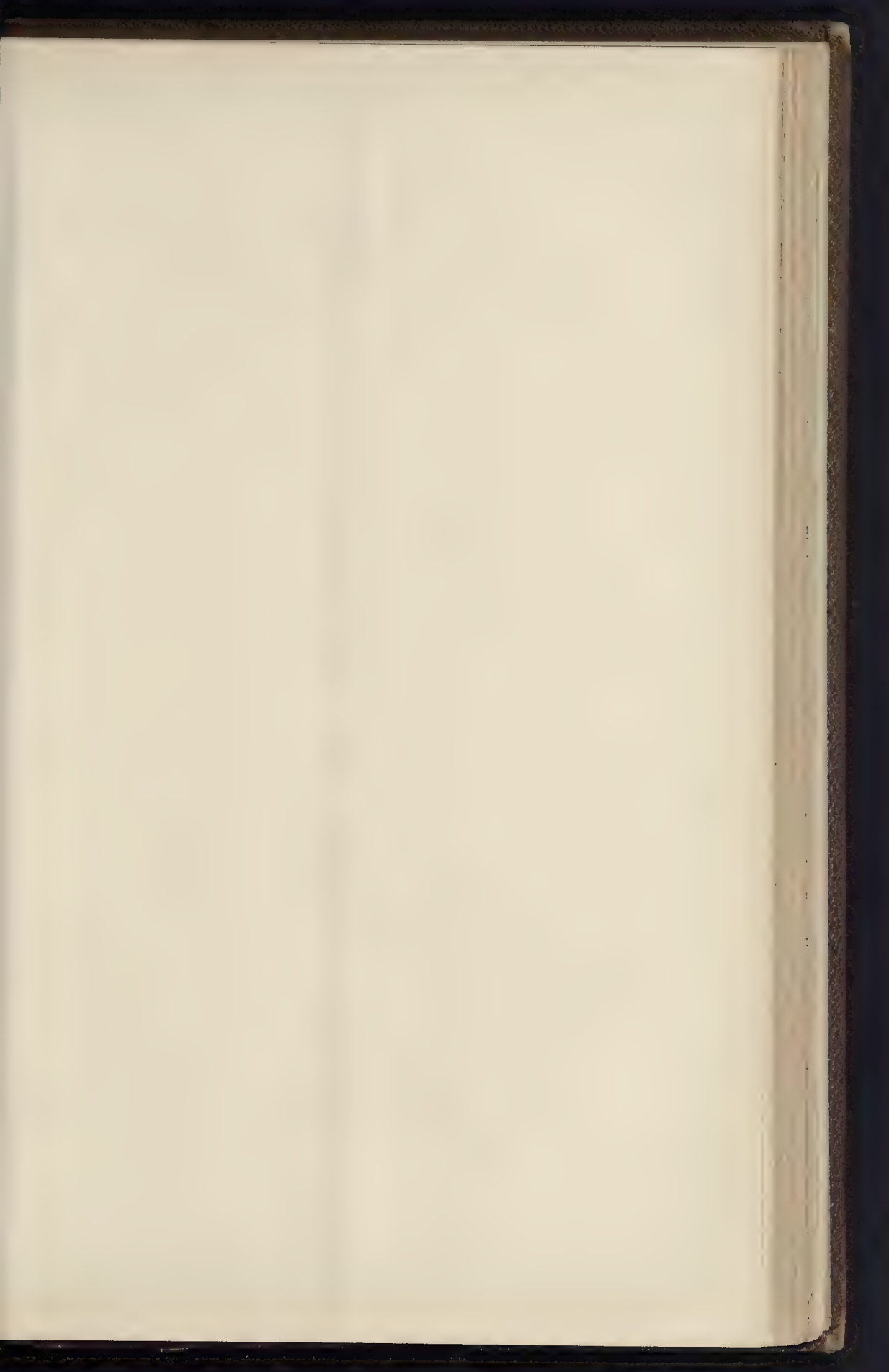
THE STAIRCASE.



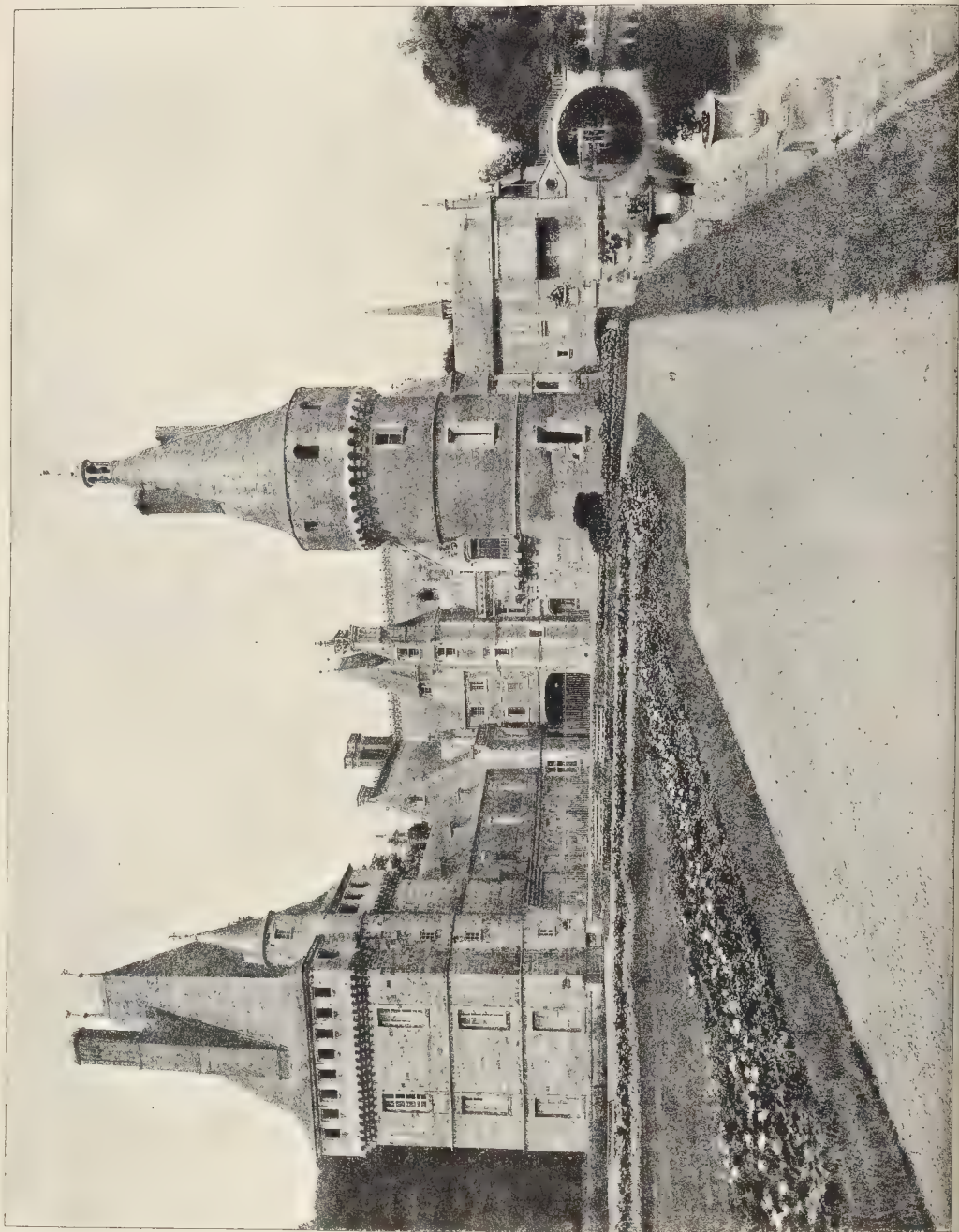




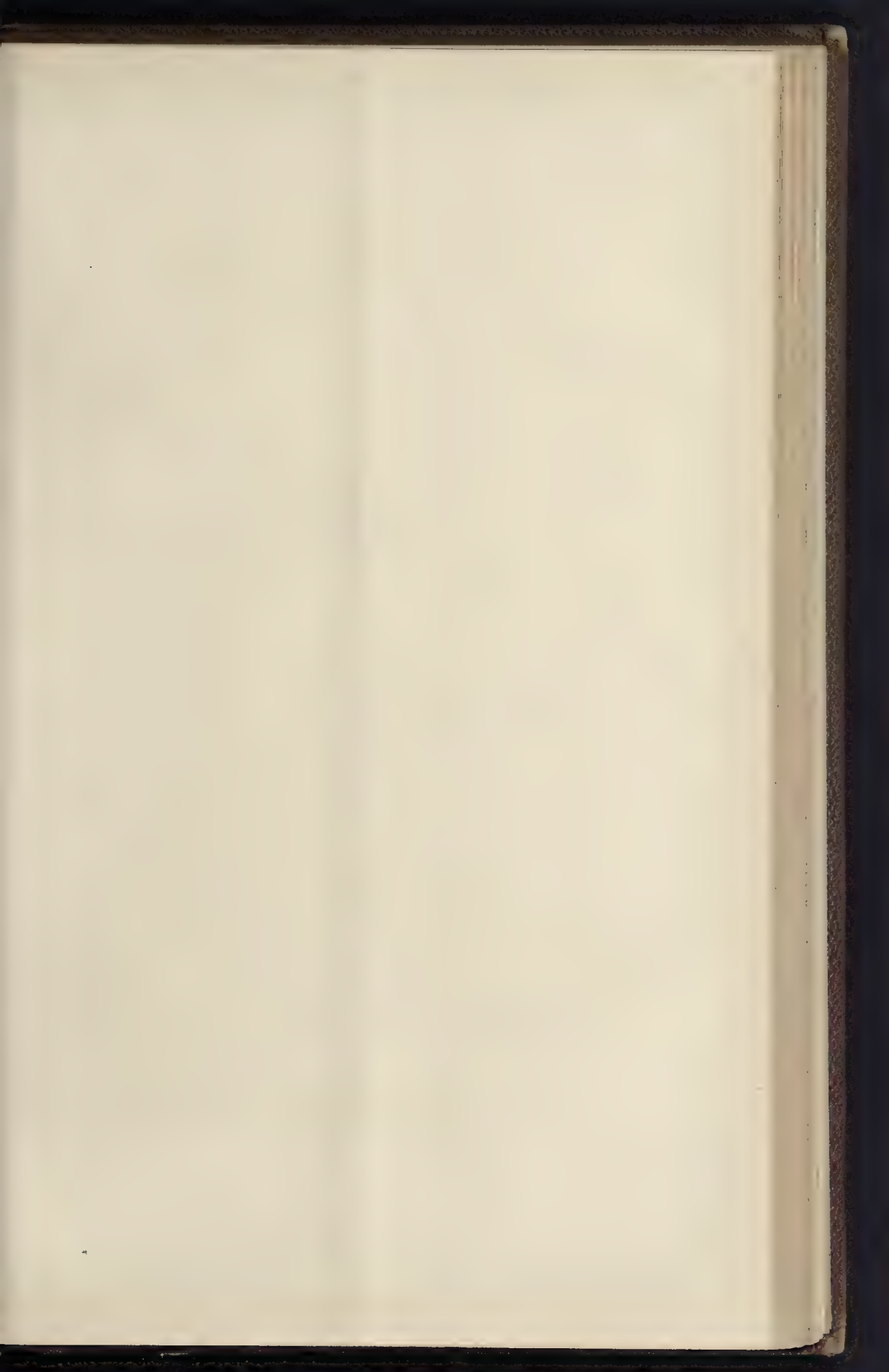




THE BUILDER, NOVEMBER 29, 1890

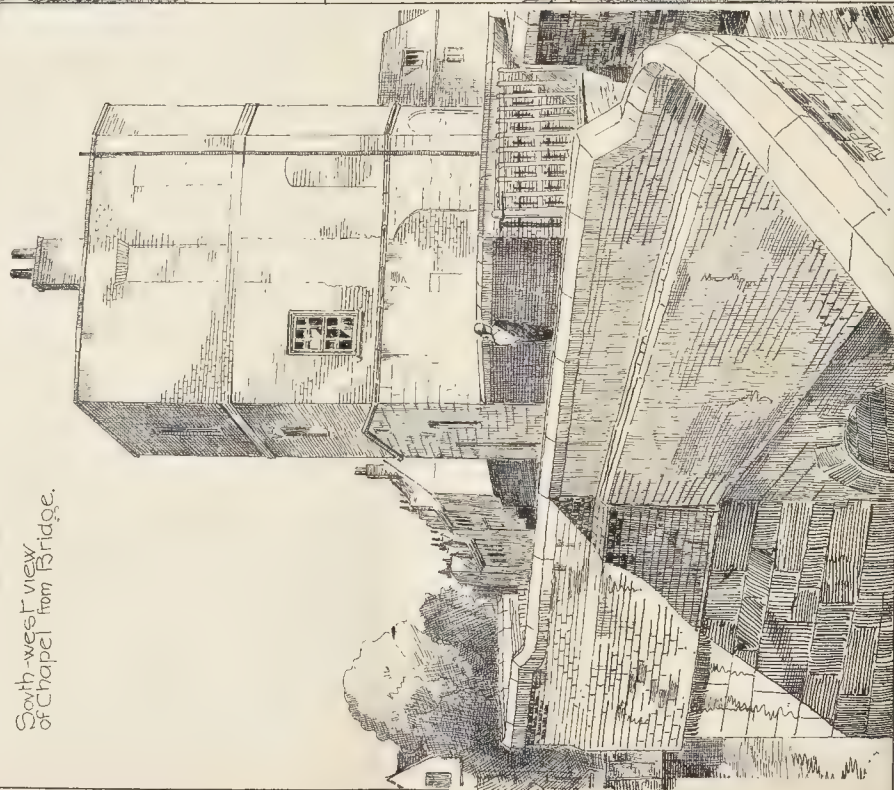






# The Bridge and Chapel, St. Ives Huntingdonshire.

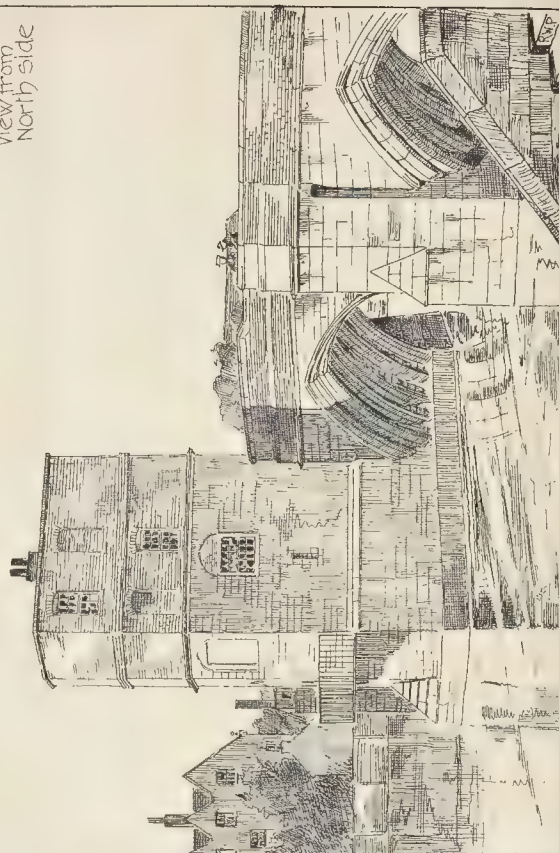
South-west view  
of Chapel from Bridge.



General View



View from  
North side







THE BUILDER, NOVEMBER 29, 1890



UNITED METHODIST FREE CHURCH, MANOR PARK, ESSEX. Messrs. D. & J. C. Smith, Architects.

See page 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.





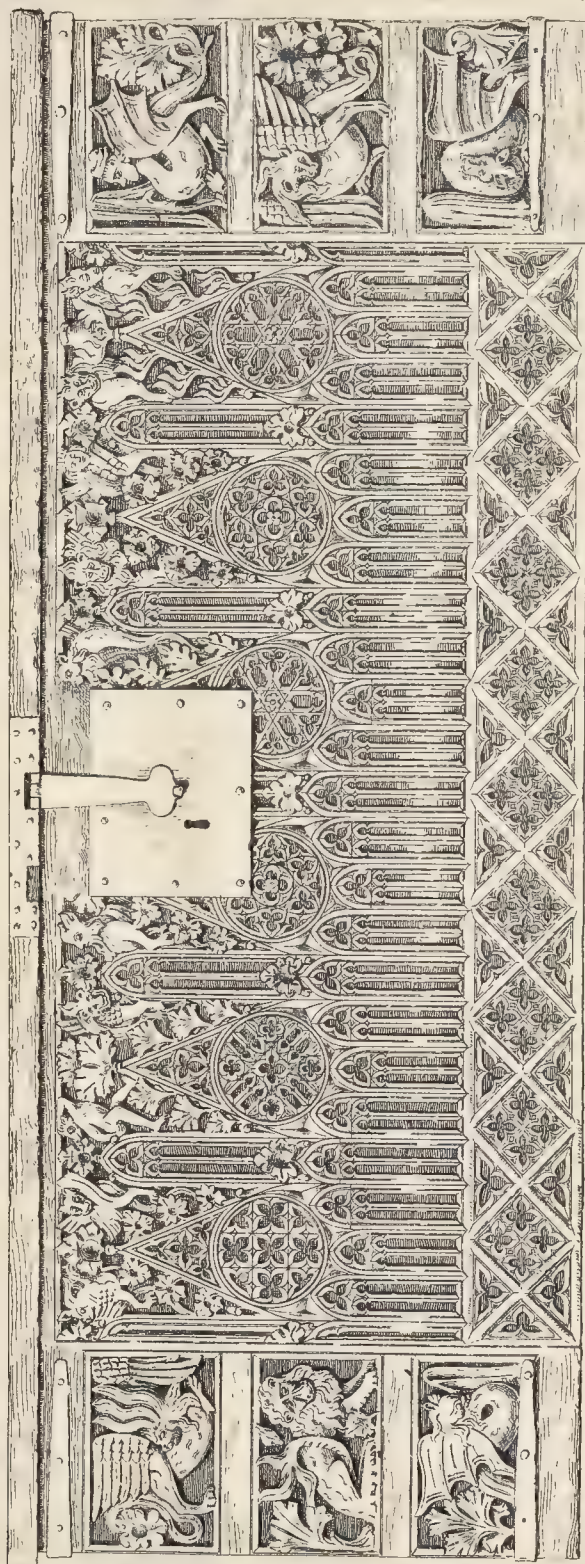
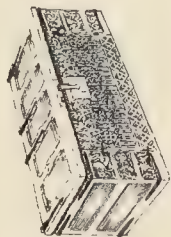
PART OF NORMAN ARCADE, ST. BARTHOLOMEW-THE-GREAT, SMITHFIELD—FROM A DRAWING BY MR. W. D. WEST





OLD OAK CHEST.

BRANCEPETH CH.



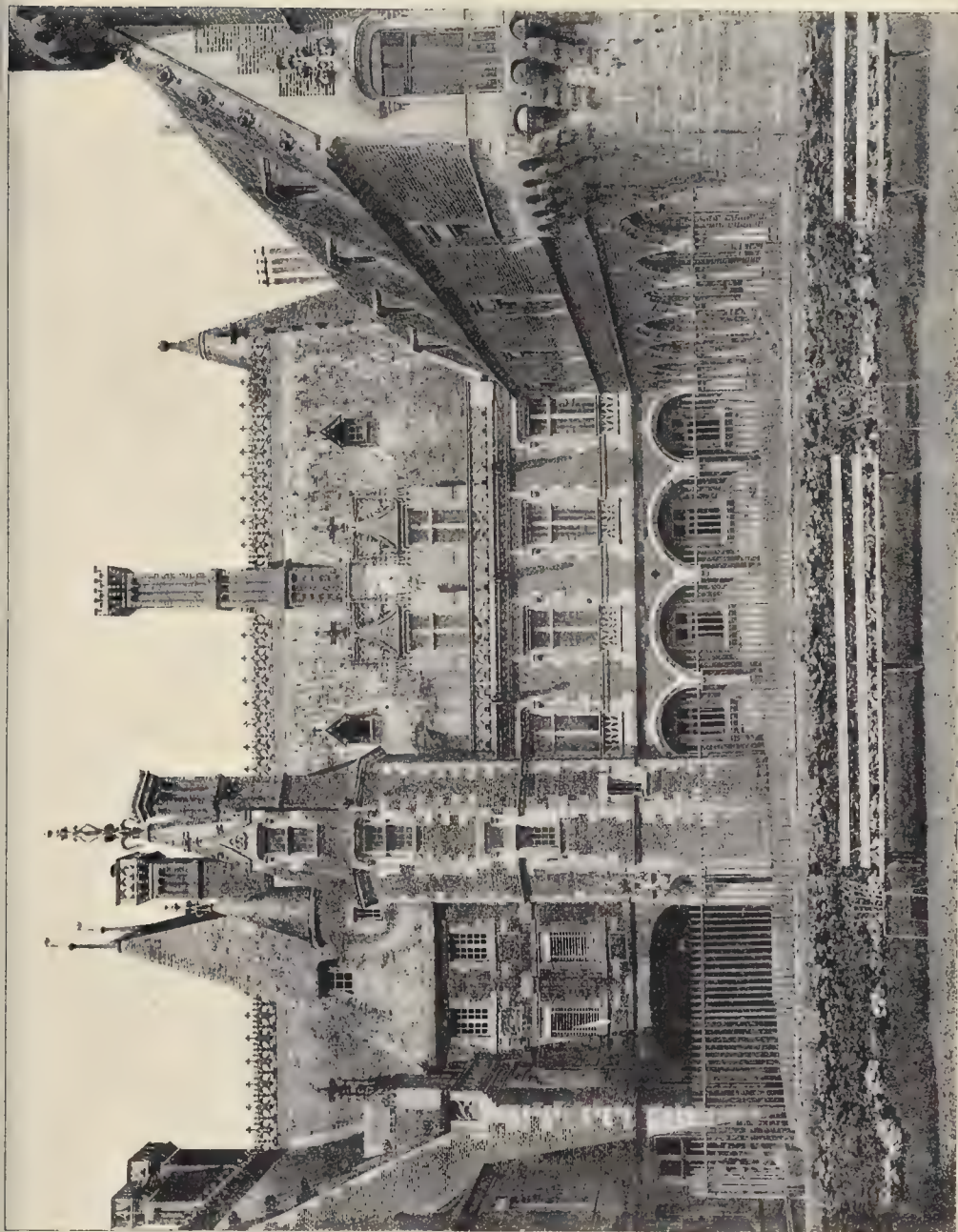
SCALE OF 12 9 6 3 0 FEET.

W. G. F. Stitt  
1890.

PHOTO BY THE GARRARD & SONS, LONDON, E.C.







THE CHÂTEAU DE MAINTENON. PRINCIPAL FAÇADE.





row." Some colouring is given to this identification of Bamborough Castle with the Garde yense in the popular name given to the igy of a cross-legged knight now lying in a church, which is known as Sir Lancelot du ke. In the reference to the monument to a memory of Grace Darling in Bamborough urchard, perhaps it is too much to ect that mention should be made the singular fact that the original figure the heroine was so worn away by the action the elements that it has already been re- ced by a second one, from the chisel of the me artist who sculptured the first. In the lef account of the church, the crypt is spoken as "probably the place where the dead of the joining monastery were laid before inter- ent," which would lead anyone to suppose the riter is under the impression that the magni- ent crypts in larger edifices were also intended r mortuaries. In another place the hand-book es that Embleton vicarage is one of the ree original fortified vicarage-houses in orthumberland, the two others being at hiton and Elsdon, whereas there are others Shilbottell, Ponteland, and Alnham; and in other place Whalton is mentioned as having e. Reference to the index shows that Shil- tell and Alnham have not been included in e survey. The vicarage-house at Alnham is, xt to Elsdon, the best specimen of these riosities of border architecture; and the amples at Shilbottell and Ponteland are both tremely interesting, the first being incor- orated with modern additions, as in that in mbleton vicarage, and the other standing, olated, in the vicarage-grounds, having been refully preserved when more modern work oe attached to it was taken down a few years ro.

There is a paragraph relating to the names f places in Northumberland that would be ill more interesting if the significant fact was lded to it that many of the hills bear names ad testify to the frequency of beacons upon em. These names are Wisp Law, Flare Cairn, py Law, Lampet Law, Watch Law, Leam eacon, Beacon Plantation, Lantern, Jenny anter, Look Out, Hook-up, Light Berks, lamboro', Lemedon, and Upper Leme. And here is another string of names of equal gnificance:—Gallow Moor, Hanging Law, fanging Shaw, Gallows Hill. In one instance, gallows that had fallen into ruin has been ously restored, and now maintains the old aditional character of the locality in which it is situated.

The editor has had the advantage of the assistance of several able hands, including anon Greenwell, Bishop Lightfoot, Sir William rossman, and many of the local clergy. These ave given special value to various parts of the ork, as in the account of Durham Cathedral, ishop Auckland, and Holy Island, and various articular parishes. The fact remains, however, hat there are districts in both counties not cluded in the scheme. The extent of the urface passed over has precluded search for inute archaeological details. However, in a road way, the two counties are faithfully re- sented, and their leading features described. n Durham the early railways, the collieries, itmen and keelmen, the lead mines, and glass nd iron and steel works are touched upon; the opular customs described; eminent men enu- erated; the castles and country-seats briefly escribed; the standard histories and guide- ooks catalogued; the inns mentioned; and a keleton tour "comprising all the chief objects f interest in the county" laid out. In North- umberland, border history, border tenures, allads, mines, agriculture, sheep and sheep-dogs, anguage, customs, superstitions, smuggling, otany, and natural history are all gone into, as well as the structural works. The editor recog- izes the architecture of the last century as "gingerbread." He says the Northumberland urches "are not generally remarkable; most f the ancient buildings are mutilated or odernized; other churches are gingerbread rections of the last century." The renovations n Alnwick Castle, in the last century, he escribes as "gingerbread;" and those made at e same period in Ford Castle are also styled "gingerbread Gothic;" and the chancel of Alnwick Church is also "gingerbread Gothic." Nevertheless, the accounts of the leading lions f the North are fairly correct. Alnwick Castle, or instance, is faithfully described. In the urch, however, ancient features recently estored, such as a row of clearstory windows on plastered up out of sight, have been

missed. Tapestry is mentioned and described as being at Hulne Abbey, which has, in fact, been removed to Warkworth Castle these twenty years or more. In the account of Warkworth Castle, the editor falls into the mistake of confusing the decisions and work of the fourth Duke of Northumberland with those of the first Duke, which rather mixes things up. He says, in connexion with this subject, it was a question with the first Duke whether Alnwick or Warkworth were most fitted for the ducal residence, Alnwick being then almost as un- tenantable as Warkworth, which is quite correct; but he adds: "When he decided in favour of Alnwick, he still caused the partial restoration of this keep, and several rooms have been fitted up with oak carvings and tapestry." This is incorrect, for it was Algernon, the fourth Duke, the grandson of the first Duke, who, a century after the decision arrived at, arrested the decay going on at Warkworth, and fitted up the rooms in question in which the tapestry mentioned is now hung. In another place, this same Duke, Algernon, is spoken of as the fifth Duke. The great gateway, known as Bonldrake tower, in Alnwick, is erroneously ascribed to the father of Hotspur. Hotspur was slain in 1403, and his father in 1409, and no parts of the walls or towers of the town were erected before 1433. The best authorities assign the erection to the son of Hotspur, to whom Henry VI. granted a licence to "wall around the whole of the aforesaid town, and embattle and machicolate the walls of the said town, and also make and order any other defences whatsoever around or upon these walls free from any hindrance whatsoever;" though a document still preserved by the Corporation shows that fifteen years after this date the work was not finished, and that a petition for help towards its accomplishment was issued by the King's "trew liegemen." In the mention of Alnmouth "Dixon's History" should be Dick- son's. And one more line might have been given to the neighbouring Lesbury Vicarage, to tell that Miss Jane Porter used to visit there. Lesbury Church, too, is another of the edifices that might have had mention. In the matter of ownership, it is of course difficult to keep a work of the kind up to date. The Chesters, for instance, needs attention in this respect.

As before indicated, these trivial shortcom- ings are but small specks upon a work that is generally executed in a masterly manner. The wild nature of some parts of the country is skilfully outlined; the free lives of the North- umberland clans; the civil wars in the moss- trooping times; the cattle-stealing, raids, and general hard conditions of old border life are brought out; and the general toning down noted from the days when the farmers gambled away their farm-stock to the present time when the handbook allows that "among all English counties the palm of courtesy and hospitality is carried off by Northumberland." In some parts, in Elizabethan times, the cattle were driven into the villages, and there watched all night; in others, wolves and robbers were equally to be guarded against. Hodgson tells us a watch used to be set at all passages and fords along the middle marches towards North Tyndale and Redesdale, that hue and cry might be raised directly thieves approached. The dalesmen were divided into clans, and the head of each resided in his own pele-tower, and exercised a right of pasture over the vast moors around them. The editor adds:—"A few of these families still exist as lairds on their ancient estates; more still as tenant-farmers on their former properties. They lost their estates through getting into debt by gambling, drinking, and betting on horses and cocks; but the old names, and much of the old pride, haughtiness, and exclusiveness remain." And, indeed, it is not at all uncommon to find farms in various other parts of the country in the occupation of families who have held them for nearly three centuries. The merchants of Newcastle, in Elizabeth's time, made a law that they would admit no apprentices from the districts inhabited by these clans, which was not repealed until 1771. The editor has picked up many of the old sayings and the old ghost stories, and some of the peculiar idioms of the country. He has not noticed, however, the frequent use of the word "shall" instead of "will" in common speech. Fragments of the old ballads, too, lie like flowers on the pages. Condensation has been the aim, yet old authors are quoted and old histories given at sufficient length. Defoe, for instance, wrote of Darlington that it "had

nothing remarkable in it but dirt and a bridge over little or no water," which serves as introduction to the improvements that have been effected since his day, and leads up to a good account of St. Cuthbert's Church, where visitors are bid to notice the "aquine" in the south side, which is evidently a "squint," and the Easter Sepulchre on the north side of the chancel. "The spire," says the editor, "is called Darlington Broach, from the fact of its being simply placed upon the tower without a guard." King James's remark that the town should be called "Darneton in the dirt" is also given, as also a slight outline of the romance of the place, by which a daughter of the post- master became the ancestress of some of the great people of the land. There is mention, also, that the inn is described in "Rob Roy." Open the bright red volume where we may, in truth, there is pleasant information in its narrow columns, compactly compressed.

London of the Past: a Picture of the Olden City. By J. ASHTON AINSCOUGH. London: Elliot Stock. 1890.

It has been said that there is much need of little books upon great subjects. We think this small volume will be found to answer the first condition, as it undoubtedly satisfies the second. Within the compass of sixty-three pages Mr. Ainscough presents us, not with a text-book, but with a collection of noteworthy facts, intended, as he says, "to draw the outlines of a suggestive picture, by grouping together piquant details of the Great City's past, and by calling attention to the striking changes it has undergone." He takes an extensive variety of topics, more than fifty in number, but dismisses each of them in a few well-considered paragraphs that serve as *indicia* to any one who would pursue its subject further. He makes many quotations from Stow's survey, and from Fitz-Stephen's much earlier record, but does not give references to several other citations which we should like to have seen supplied.

Turning to matters in which we are more particularly concerned, we notice that he directs attention, under the somewhat large heading of "Architecture of Old London," to Crosby Hall, the hair-dresser's shop in Fleet-street, opposite to Chancery-lane, and Staple-inn. The last-named, he might have added, has been lately re- habilitated for the Prudential Assurance Company by Mr. Alfred Waterhouse. Of the older houses, he says: "The material of which the houses were constructed was chiefly wood, chestnut being the variety most in use." Yet we think that chestnut, albeit sometimes employed for screens, open roofs, and similar ornamental work, where money was to hand, was not used for ordinary purposes to the extent that the writer seems to indicate.

In these more enlightened days, we cannot easily figure to ourselves the depreciatory manner in which strangers and foreigners were regarded by our fellow-citizens. In the two pages in which he speaks upon their disabilities in London, Mr. Ainscough touches upon a topic which has not been commonly explored, and should form an important chapter in the domestic history of the town. "Strangers and other mean people" are held up to obloquy: by "strangers" we should understand intruders from without the City limits; and there are many contemporary evidences of the restrictions that were placed upon their traffic with the citizens, especially in the case of im- migrants from beyond sea and dealers in foreign wares. The persecution of the Jews was greatly due to causes other than their alien origin. The author devotes a few words to the City walls, of an important piece of which, in Ludgate Hill, we gave an account three months ago.\* The concluding eighteen pages are devoted to the rural surroundings of London, its gardens and orchards, the environs, and Vauxhall and Ranelagh. In noticing Marylebone, whilst giving its correct derivation to the name of the parish, Mr. Ainscough does not quite correctly say that the Tyburn rose near Primrose Hill and flowed through what is now called Tyburnia. It did flow through the parish, but towards the gallows at what is now the southern end of Marylebone-lane; the gallows, on removal further westwards, appear to have taken the name of Tyburn along with them. Though we cannot say that this book casts much new light upon an old, yet inexhaustible, subject, it is refreshing to meet with a writer

\* See "Note" in the Builder, August 3



who, whilst cognisant of their multitude, sparingly uses the vast materials at his command, and so using them does not weary us or lead us astray.

*Holy Trinity Church, Hull: a guide and description.* By J. R. BOTLE, F.S.A. London: Simpkin, Marshall, & Co. Hull: A. Brown & Sons. 1890.

THIS is a good attempt to put together all the historical facts of interest as to a church which is not in itself very interesting, but is the chief ancient architectural monument which Hull possesses. The illustrations of the interior would have been better omitted: they are rather too much of the "guide-book" type.

*Two Beverley Churches: The Minster.* By W. STEPHENSON, M.R.C.S., and *St. Mary's Church,* by JOHN BILSON, A.R.I.B.A. Hull: A. Brown & Sons. 1890.

THIS is a pamphlet containing papers read by the respective authors on the occasion of the visit of the British Association to Beverley on September 11 of this year. The first is mainly archaeological and historical, the latter, as might be expected, more architectural in character. There are no illustrations, but the writers understand their subject, and the pamphlet will be a useful companion for any one about to visit Beverley.

## Correspondence.

To the Editor of THE BUILDER.

### TEMPLE OF NIKE APTEROS.

SIR,—In "A Letter from Athens," Professor Aitchison, referring to this Temple of Nike Apteros, writes:—"As we owe the re-erection of this temple to the munificence of Dr. Schliemann—"

There must be some misapprehension here. It is generally understood that this little temple was demolished by the Turks, in order to establish a battery, during the siege of 1687, the fragments forming part of the foundation of such battery.

When the remains of this work were cleared away in 1835, the architects,—Schaubert and Hansen, who, with Professor Ross, had charge of the excavations,—found the fragments of the temple comparatively uninjured, and, with great patience and skill, they reinstated the whole as it now stands, almost perfect, on its original terrace.

Great as is the honour due to Dr. Schliemann for his munificence in other matters, he would certainly not desire to appropriate the credit for the work done, and so well done, by Messrs. Schaubert and Hansen, some fifty-five years ago.

When recently in Athens, I noticed with regret how much the fallen column (not columns) of the Temple of Jupiter Olympius had continued to suffer by the injuries inflicted by thoughtless persons since its fall in 1852.

ARTHUR CATES.

### BRIDGE CHAPELS.

SIR,—I venture to supplement the list of those given in your illustrated article of last week with the names of Doncaster, Ludlow, across the Tame (St. Katharine's), Bideford, Richmond (York's), Leeds, Bristol, Bedford (St. Thomas's Chapel, Bunyan's gaol), Catterick (St. Ann's), and Droitwich (road through chapel). Leland, who returned from his tour in 1542, cites a bridge across the Thames at Canham, perhaps Caversham, and that of Archbishop St. William across the Ouse at York. He also says:—"I entered Rotherham by a faire stone Bridge of four arches, and on hit is a Chapel of stone, well wrought." The Wakefield bridge across the Calder is, *etc.* Hall, the scene of the young Earl of Rutland's murder by Lord Clifford, in December, 1460. Norrison Chifford wrote two treatises—1828 and 1843, London, 8vo—upon this and similar wayside chapels. He ascribes its date to before 1357, rather than to 1460-1. He uses the somewhat polemical style not infrequent with essay writers of an old school, yet what he says is worthy of attention. He compares St. Mary's Chapel with Prior Crawden's chapel at Ely, 1321-40, and is "almost persuaded" they were built by the same architect, Alan de Walsingham. It has been illustrated by Toms, after George Fleming, 1743; Lodge, in Thoresby's Ducatus; and Cawthorne, circa 1800. Together with the "Little Lady Chapel" over the Don,

at Rotherham, and of which mention is made in 1483, it forms the subject of the architects, Messrs. J. C. & C. Buckler's, book in 8vo, printed at Oxford, 1843. Those authors are of opinion that the St. Mary's Chapel, Wakefield, was early fourteenth century work. In Hone's "Table Talk," L. 413-6, is an account, with woodcut, of the Elvet bridge, Durham, originally built by Bishop Pudsey, about 1170, where formerly stood the chapels of St. Andrew and St. James, and, according to some, another which gave name to the Magdalen steps there.

W. E. D. M.

### PRESERVATION OF THE MONUMENTS OF ANCIENT EGYPT.

SIR,—In one of your "Notes" in this week's issue, you lament the small number of signatures to the memorial to Lord Salisbury, as evidencing the lack of interest in the subject on the part of those present at the last meeting of the Institute. Permit me, as one of the implicated individuals, to explain that I had not the remotest idea that there was any petition to sign. The invitation to do so may have been on the printed "agenda," but I cannot now say, as mine is destroyed. The President referred to the matter at the commencement of the meeting, but I failed to catch his concluding remarks. I scarcely think the matter was sufficiently notified to the meeting, else I feel sure the members would have very cordially supported the Council in their laudable efforts, especially if the sphinx is in the jeopardy alluded to in the letter in the *Times* of this date.

November 25, 1890.

F.R.I.B.A.

### "CEMENT TESTS."

SIR,—I have read with much interest the letters in your paper, *re* Cement Tests, in reply to my communication in your paper of October 25 last. The view I had in mind when writing the same was not so much to start a discussion upon sundry characteristics of a good Portland cement, or the relative value of some tests, but rather to show what had been done in Prussia in the matter of bringing into uniform shape various opinions and specifications. The rules have quoted were given by the Prussian Minister of Public Works for his department only, which is a very large one, but the convenience of having short, precise, and uniform rules has proved so great that they are now largely used beyond their originally intended sphere of application, and I am informed that they are enforced in many private works, in works undertaken by Municipal Corporations, &c.

In order to show that there is really not much difference between these rules and those adopted by the first Municipal Authority in this kingdom, I quote the following from a specification of the late Metropolitan Board of Works, issued shortly before its dissolution:—

"The whole of the cement for these works, and herein referred to, is to be of Portland cement of the best quality, ground so fine that the residue in a sieve of 5,360 meshes to the square inch (equal to about 76 per lineal inch) shall not exceed 15 per cent. by weight. When tested, should the proportion which will not pass through the sieve be greater, a quantity of neat cement equal to such excess shall be added (at the contractor's expense) to the specified proportions of all cement, mortar, or concrete, used upon the works. When brought upon the works, it is immediately to be put into a dry shed or store which the contractor shall provide for the purpose, having a wooden floor and all approved necessary sub-divisions. The cement is to be emptied out upon the floor, every ten tons being kept separate, and is not to be used until it has been tested by samples taken from different sacks. The cement is to be gauged with three times its weight of dry sand, which has been passed through a sieve of 400, and been retained upon one of 960 meshes to the square inch. The cement and sand having been well mixed dry, about 10 per cent. of their weight of water is to be added, and briquettes formed in moulds of 1 in. circular area at the weakest point. The briquettes, having in the meantime been kept in a damp atmosphere, are to be put into water twenty-four hours after they have been made, and remain in water until their tensile strength is tested by means of apparatus belonging to the Board, and by their officers. These briquettes must bear, without breaking, a weight of 230 lbs. per square inch, twenty-eight days after the briquettes have been made; and the cement, neat, must not at any season of the year set in less than one hour. Any cement which does not answer the requirements will be rejected, and must be forthwith removed from the works. Briquettes of neat cement shall also be made and broken after seven days, as may be directed by the Engineer. The limit of resistance and the weight of the cement shall also give results to his approval. The cement store to be provided with a Chubb's patent lock and key, to be obtained and fixed by the Board."

I have no doubt that this specification is based on the excellent experiments made by the late Mr. Grant, one of the Assistant Engineers of the Metropolitan Board of Works, who was a pioneer in this question, and to whom we owe very much in all matters relating to cement. It is difficult to say

with certainty to whom belongs the credit of having first laid down these rules; but this I know, that much in relation to Portland cement has come, with the name, from this country to Germany.

The value of uniform standard rules is recognised on the Continent beyond the limits of the Prussian kingdom, and a permanent Commission is at work to establish further rules for universal acceptance, based on the latest and most extended experiments. This commission meets periodically, and, at its last meeting, in Berlin, on September 19 and 20 last, there were present or represented, besides the heads of all the larger German engineering laboratories, the heads of public and private engineering laboratories in Austria, Switzerland, Russia, Sweden, France, and Holland, and also representatives of the cement industry, notably Dr. Delbrick, of Stettin, president of the Association of German Portland Cement Manufacturers.

I fully agree with what Professor Beare has said in his letter in reference to the desirability of some standard rules for this country. There is certainly no need for Government interference in this matter. In these days, when "time is money," surely it must be a great advantage to all concerned to be able to work to standard rules that have been adopted in this country by representatives of the profession and cement industry alike. Engineers are now put to the test of saving the trouble they are now put to of finding out for themselves, out of a mass of confusing information, what appears to them a good specification, and manufacturers will not be subjected then to one sort of test here and another one there.

I conclude with quoting an instance that has recently come to my knowledge which I think will demonstrate the value of standard rules. An engineer in charge of works decided to test cement supplied to him by a manufacturer. To do so he used wooden moulds, in which he made his briquettes. When examined before testing, the briquettes presented a very rough appearance on the sides, as the cement had crumbled away, the wooden moulds having sucked up the moisture. The result was the cement was condemned, which, of course, was a hardship to the manufacturer, the moulds being at fault, not the cement.

H. ALFRED ROEHLING, Assoc. M.Inst. C.E.

### DEATH IN THE VENTILATOR.

SIR,—It would have been more creditable to Mr. Simmuna for him to have cordially admitted his mistake, than to lay the blame upon the unconscious ventilator, as he does on p. 409. He advocated the use of a particular style of ventilator, which was unsuitable and dangerous for that particular purpose, and, when corrected, he is now puzzled to know why a cowl on the roof of a soil-pipe requires to let air in as well as to let it out. I gave the reason on page 372.

He further tries to cover up his mistake by the red-herring process in asking, "Why use an extraction-cowl at all, if it is to let air in as well as to let it out?"

Now, the letting-in part of the work is only momentary,—when, a cowl, &c., is being discharged,—and a proper cowl is useful in many cases for preventing continuous blow-down, which, without it, would often happen with the plain, open pipe in many situations. Further, in cases where there is a self-acting fresh-air inlet-valve at foot of soil-pipe, &c., it often happens that, although the plain pipe is not used, the plain pipe, the putting on of a good exhaust ventilator opens it, and thus the end desired by the architect or plumber is attained.

The letter from Mr. Simmuna on page 409 is clever enough, but at the same time it is only quibbling.

P.S.—As this matter of selling valve ventilators to plumbers or other people for use upon soil-pipes seriously affects the health of the community, Mr. Simmuna should get his firm to recall the circulars sent out recommending such, and issue new circulars cautioning against the use of these upon soil-pipes, or they may find themselves sued for heavy damages should evil ensue from their use.

W. P. BUCHAN.

Glasgow, November 22, 1890.

### HARRINGAY SCHOOLS.

SIR,—With reference to the design you published last week for the Haringgay schools, and which is described as "Second Prize Design," I think it right to let you know that my design for the said schools was adjudged of equal merit with that of Messrs. Mitchell & Butler, and we divided the second prize of £52. 10s. equally between us.

HOWARD CHATFIELD CLARKE.

### OBITUARY.

MR. LAWRENCE MARR.—The death is announced of Mr. Lawrence Marr, contractor and team-owner, of Lodge-lane, Liverpool. According to the *Liverpool Daily Post*, among the many contracts which he deceased carried out were the excavation works in connexion with Lime-street Tunnel and Exchange Station, not to mention road-making on a large scale under the Corporation and various suburban boards.



## The Student's Column.

HOT-WATER SUPPLY FOR BATHS, LAVATORIES, &c.—XXII.

### FAULTS AND SOURCES OF DANGER.

**I**n enumerate all the faults that may meet even a single individual's experience would occupy a great deal of space, but there are some of a very common character that it may be profitable to enumerate and describe. One is the connexion of a draw-off service (or service) to the return-pipe instead of the flow. This, although of frequent occurrence, can only be the work of an utterly ignorant or careless man, or one who has been accustomed to heating work in which the return-pipe has all, or nearly all, the services connected to it. This fault is usually recognised by one tap yielding water of a very different temperature to the others, but if all taps should be from the return-pipe a difficulty may be experienced in judging whether the boiler or other part of the apparatus is at fault, unless the pipes are all exposed so that the error in connexion is obvious.

Another, and only too frequent, cause of failure is a boiler of insufficient power. This can usually be detected in a measure by the fact that hot water is only obtained some hours after the fire is lighted, or only some time after the early demand has temporarily ceased—say, between breakfast and luncheon hour. There are great numbers of ranges condemned on this account, as but few range-makers even now seem to comprehend that an efficient supply of hot water is as essential as efficient cooking facilities, and the most miserable boilers are often provided with what otherwise may be first-class ranges. The only remedy is to introduce a good hot boiler, or an independent boiler if needed.

Sometimes the work of a boiler is rendered next to futile by reason of the pipes being exposed to such an extent as to cause a serious loss of heat by radiation. This happens when the pipes are carried along cold galleries or in cold corridors, or if they are carried in vertical casings which are not packed or filled with some poor conductor of heat (as has been already explained), or what, perhaps, is the most frequent cause of this trouble, the tank being situated and exposed in a roof where it is robbed of its heat as fast as it is possible to do so.

Another frequent cause of trouble is omitting to terminate the return-pipe in the boiler at a lower point than the flow, although every care is exercised to terminate the flow at a higher point than the return in the tank. This arrangement is adopted by many, who profess that it gives equally good results as making the return lower than the flow in the boiler. Certainly, if the apparatus is once started right and kept going without cessation, no trouble would afterwards arise, but when starting with cold water in every part of the apparatus there is no knowing which pipe will act as the flow and which as the return, for as both openings are at a level, and as there is no influence brought into action to cause the first particles of heated water to travel up one pipe in preference to the other, there will be no knowing which pipe will act as the flow or which as the return; and, further than this, the pipe that acts the part of a flow one day will, possibly, be the return on the next, and would give rise to a complaint that although hot water could be had one day, the supply was bad another day; and there is every likelihood of the servants being blamed for this, as it would be attributed to non-attention to the fire or non-cleaning of the flues.

The mere fact of one pipe standing higher than the other in the tank makes no difference whatever when starting an apparatus charged with cold water. The chief use and object of the flow-pipe reaching a high position in the tank is to enable us to draw off the hot water without having the inflowing cold water mixed with it.

Sometimes a fitter is unfortunate enough to lose his bearings, so to speak, and ends up his work by crossing his pipes,—that is, connecting the flow-pipe from the boiler into the tank as a return, and the return-pipe from the boiler into the tank as a flow; this can only happen in a large and complicated apparatus; and although the water will circulate very well there is the disadvantage of having the flow-

pipe proceeding from the bottom of the tank, where the cold supply enters; and when a tap is opened we do not get the hottest water by many degrees, for the water will flow as indicated by the arrows at Fig. 60. This is usually easy of remedy by transferring the stand-pipe in the tank from one pipe to another. This could only happen with the tank system, and it will be noticed that some of the faults under discussion are distinctly peculiar to this system, while others apply to the cylinder principle.

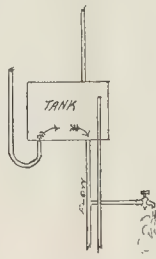


FIG. 60.

It frequently happens that, for the sake of economy, the cold supply to a cylinder is branched from an existing house service, instead of bringing down a distinct cold supply service for the purpose. This is frequently a saving of expense, but it has two drawbacks, one of them of a rather objectionable nature. The first is that, supposing we open a cold tap and a hot tap at one and the same time, as we often do at a bath or lavatory, both taps will run at an annoyingly low speed (unless a high pressure exists) as both services are fed by one supply-pipe from the cistern; whereas with an apparatus that has a distinct cold supply, as it should have, the water will issue from both taps at an equal force, as in this case each outlet has its own distinct supply from the house cistern. This objection would not be felt, of course, if the cold and hot taps were never opened together, or if the one cold house service was of unusually large size.

The other and more objectionable feature with the one service pipe supplying the cylinder as well as the cold taps is, that if any of these latter are near the cylinder, warm water will be drawn (unless a stop-back valve is provided).

We have already explained that a very long draw-off service may be looked upon as a fault by reason of the waste of water it entails, but an instance once came to notice in which this practice caused sufficient trouble to amount to a complete failure. In this case an apparatus existed upon the tank system, with the reservoir at the top of the building as usual, and an attempt to gain the safety of the cylinder system was made by taking away all the draw-off services from the flow-pipe and substituting a single draw-off service taken from the top of the tank and carried down the

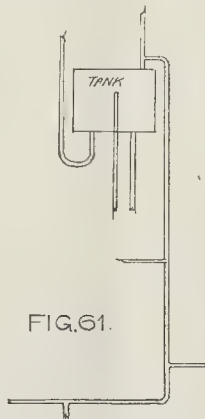


FIG. 61.

house to the different places where hot water was required, as fig. 61, so that this single

service was about 120 ft. long in all, the house being a high one, and the waste it occasioned neutralised the efforts of the boiler.

On new buildings a method is largely practised of running pipes on the walls before they are plastered, the plaster afterwards being laid over them. This has certainly two good features, one being that the pipes present no unsightly appearance, and the plaster and brickwork prevent to a great extent loss of heat by radiation; but immediately the pipes require exposing for any purpose whatever a great expense becomes necessary, as it must impair the decorations, which may be costly. While the apparatus is working satisfactorily, it matters not whether the pipes are in view or hidden, but there are so many purposes for which the pipes require inspecting that trouble of a more or less serious character must arise at some time with pipes that lie beneath or in the plaster.

Closely allied to this is the trouble occasioned by omitting to put "connectors" (union pieces) into the service-pipes at convenient points, so that when a pipe requires disconnecting at any particular place it may be necessary to take the pipes down for some distance, or else cut the pipe. This is a frequent source of trouble, and it often retaliates on the workman himself, as should he leave a leak to pick up (i.e., rust up), and the leakage refuses to remedy itself in this manner, then the workman has to return to disconnect and reconnect his pipes. This unworkmanlike practice of leaving leaks to remedy themselves is only too prevalent, for workmen are apt to leave leaks of too serious nature with the hopes of their stopping of their own accord, and this induces a client to think that bad workmanship may have been introduced into the whole undertaking. A leak that only permits of one drop of water falling, say every ten minutes, will remedy itself (in plain iron pipe) very soon by the mere oxidation of the metal, and the joint will be as good after this has taken place as any perfectly-made one; but it is much better to remedy all leaks in a workmanlike way, as otherwise it is apt to lead to carelessness in this particular direction.

### GENERAL BUILDING NEWS.

**NEW WESLEYAN CHAPEL, LEEDS.**—On the 11th inst. the opening ceremony of "Eldon" Wesleyan Chapel, which has been erected in Woodhouse-lane, Leeds, was performed by Mrs. W. T. Miers. The chapel is 70 ft. long, and 51 ft. wide. It is in the Decorated Gothic style of architecture, and has been carried out from the designs and under the superintendence of Mr. George F. Danby, architect, of Leeds. It is built of stone, lined with brickwork, and the internal woodwork is of pitch pine. In the centre of the first elevation the main entrance consists of a double doorway, each being of stone. The ground-floor is entered from the centred doorway, passing through lobbies into a large inner vestibule, 30 ft. by 8 ft. The seats will provide sitting accommodation for 520 on the ground-floor, and 230 in the gallery. The chancel is separated from the chapel by a moulded arch supported on granite columns and carved stone bases and caps, with a tracied circular window filled in with stained glass beyond. The pulpit is of polished pitch pine. Two and three-light tracied windows, terminating in gables, are arranged on both sides of the chapel, filled in with leaded lights. The roof is open-timbered, and is covered with green Westmorland slates. The heating is by the low pressure hot-water system. The contractors for the stone and brickwork are Mr. Chas. Myers; carpenter's and joiner's work, Messrs. Craven & Umpleby; slating, Messrs. John Atkinson & Son; ironfounder's work, Messrs. J. & H. Smith; and warming apparatus, Messrs. Holmes & Co.

**NEW CHURCH AT HALIFAX.**—On the 13th inst. a new church, dedicated in the name of St. Jude, was consecrated at Halifax by the Bishop of Wakefield. The church stands at the north-east corner of Savile Park. The plan comprises a nave with aisles and tower at the south-east corner, chancel with clergy and choir vestries on the north side, and organ transept on the south. The tower is 95 ft. high. The style is that of the fifteenth century. The font is of Caen stone and the pulpit of oak. There is accommodation for about 500 worshippers. The total cost is about 8,400. Mr. W. Swindon Barber, of Halifax, is the architect, and the contractors are Messrs. J. Charnock & Sons, Messrs. T. Bancroft & Son, Mr. John Naylor, and Messrs. Jonas Birns & Sons.



**A NEW PUBLIC SCHOOL AT LEITH.**—On Saturday, the 22nd inst., a new school, to be called Copper-  
street Public School, was formally opened at Leith  
by Lord Young. The school, which is built of red  
and white sandstone, will accommodate about 1,880  
pupils, and the cost will be about 14,000*l.*, exclusive  
of the price of the site. The main building measures  
about 127 ft. by 75 ft. deep, and consists of three  
floors. On the ground-floor is a large central hall,  
82 ft. long by 22 ft. wide, and on the same floor are  
nine class-rooms. On the first and second-floors are  
similar central halls, each having ten class-rooms  
branching off. A stair, made of iron and steel,  
leads up from the ground-floor; and the floors of  
the halls are all fireproof. On the second-floor are  
situated the cookery, sewing, drawing, and music  
rooms, and these are all lighted from the roof,  
which, being flat, is fitted entirely with glass. The  
architect was Mr. George Craig, and the builder  
was Mr. William Baxter, Leith.

**MANCHESTER GIRLS' INSTITUTE.**—The founda-  
tion-stones of a new institution, to be known as the  
Manchester Girls' Institute, were laid on the 15th  
inst. The site of the new building adjoins the  
hospital in Mill-street, Ancoats, in the centre of a  
thickly-populated district. The basement of the  
building will consist of a gymnasium (with a dress-  
ing-room), nine separate baths, and several class-  
rooms. On the first-floor there will be a restaurant,  
a library, a room for a clothing-club, a kitchen, and  
a room in which lessons in cooking are to be given.  
The next floor consists of an assembly-room and  
several class-rooms, while above that are the car-  
taker's apartments. There is to be a laundry  
behind the building. The cost of the building, which  
is in red brick and terra cotta, together with the  
furnishing and the heating and ventilating appli-  
ances, is estimated at 7,800*l.* The architects are  
Messrs. Darbyshire & Smith, of Manchester.

**NEW PUBLIC SCHOOL, GLASGOW.**—The new  
Public School in West-street, Calton, Glasgow, was  
formally opened on the 15th inst. by the Lord  
Advocate. The school is situated at the junction  
of West-street and McKee's-street. The main  
building, which is three storeys in height, is 99 ft.  
long by 83 ft. 6 in. wide. The walls of the principal  
fronts are built of rock-face ashlar, and terminated  
at the top partly by a parapet and partly by a  
boldly-moulded cornice. The roofs are pavilion,  
and covered with Eiterwater slate. The buildings  
are of red freestone from Gatelaw Bridge quarries,  
Dumfriesshire; the boundary walls are faced with  
vitrified bricks, and the latrine walls with white  
enamelled bricks. The playbeds are roofed with  
concrete, and the playgrounds throughout are  
paved with granolithic. The style of architecture  
is Romanesque. Internally the centre of the  
building is occupied by a rectangular hall, which is  
enclosed on its two sides by class-rooms, and on the  
ends by entrance porches and teachers' rooms.  
The stairs are wide and of easy gradient, the  
stringers and breasts of steps are of rolled iron,  
the treads of Arbroath stone, and the plats of gran-  
olithic. Hall and staircases are roofed with glass.  
The accommodation for scholars comprises an  
infants' school, sixteen class-rooms, a drawing-room,  
and a kitchen for cookery lessons. The school ac-  
commodates in the aggregate 1,512 scholars. The  
teachers' accommodation comprises six rooms, two  
on each floor. The whole building is heated on  
mild hot-water system, the hall and staircases are  
warmed by six radiators. The work has been exe-  
cuted under the superintendence and from plans  
prepared by Mr. John Gordon, architect, Glasgow.

**BUSINESS PREMISES, BLAXFORD-ON-TYNE.**—The  
Blaxford District Industrial and Provident Society,  
Limited, has opened part of a new building which,  
when completed, will be 120 ft. in length. The build-  
ing already erected forms the grocery and provision  
department, and has been fitted up with the most  
modern means for easy working and quick  
despatch. The architects were Messrs. Thompson  
& Dunn, Newcastle-on-Tyne. The building is three  
stories in height, and the design is described as a  
free and bold treatment of French Renaissance,  
executed in Gunnett stone.

**NEW BATHS, SALFORD AND BROUGHTON.**—The  
Salford Borough Council at their last meeting ac-  
cepted the tenders of Messrs. R. Nell & Sons for  
Messrs. Bradford's for the engineering and boiler  
amounting to 1,669*l.* The designs are by Messrs.  
Mangnall & Littlewoods, architects, Manchester,  
and were selected in a competition. The land is a  
road and Derby-street, and is well adapted for its  
purpose, being in a populous neighbourhood. —  
Broughton is also having new baths erected by the  
same architects. They are situated in Great Clive-  
street, and are advancing rapidly towards com-  
pletion, the Baths Committee being sanguine of having  
them ready for use next summer.

**NEW MALTHOUSE, LIVERPOOL.**—Besides the exten-  
sive range of buildings comprising a six-story  
200 quaters) recently completed and extending  
from Albion Wharf to Key-street, Messrs. R. &  
W. Paul have just erected another new malt-house  
at Eagle Wharf, adjoining the dock, also a large  
before malting it. The malt-house is situated on a  
portion of the site of the buildings formerly known  
as the Eagle Foundry, and extends 190 ft. back

from the public quay. It consists of a five-storied  
building, for 150 quaters sleep, with a kiln and  
its eastward end fitted with some of the most  
modern appliances. The drying-floors are laid  
with Herrmann's patent wire work, supplied and  
fixed by Messrs. Lewis Orlick & Co., and the heat-  
ing apparatus is Tomkins, Courage, & Cracknell's  
patent, fitted up by Messrs. G. J. Worsam & Co.  
The first floor of the warehouse is entirely occupied  
by a malt-store, and has a capacity for 5,500 quaters.  
An elevator is provided for the barley stores on  
the west or dock front, also skip lifts from the  
cistern, and for loading the kilns, all of which, with  
Bobby screens, &c., are driven by a 10-h.p. gas-  
engine. On each story of the malt-house there are  
several lines of hanging skip tramways for dis-  
tributing the wet grain upon the floors, and these  
are also worked in connexion with the lifts for  
loading the kilns. The grain-cleaning factory is a  
four-storied building, about one-third of which is  
occupied by special and costly machinery, effecting  
no less than thirteen separations of the grain and  
removing dust, offal, and all foreign matters. This  
machinery is driven by steam-power. The whole  
of the buildings were designed by Mr. Thomas  
Miller, M.Inst.C.E., and Engineer to the Ipswich  
Dock Commission, and they have been carried out  
by the contractors, Mr. Fred. Bennett for the  
malt-house; Messrs. Cockeside & Co. for the  
machinery; and Mr. R. Gilling for the grain-  
cleaning factory.

**CHURCH RESTORATION IN RADNORSHIRE.**—The  
restoration of the dilapidated old Church of St.  
Mary, Llanfared, Radnorshire, has been com-  
menced, from plans prepared by Mr. Ernest Collier,  
of Carmarthen. The work includes new stone  
windows in place of the nineteenth-century square  
wooden ones, new buttresses, and crosses, an oak  
bell-turret at the west end, wood-block floor in the  
nave, and marble mosaic pavement in the chancel,  
oak choir stalls and reading-desk, oak pulpit, and an  
oak vestry screen. The contractor is Mr. J. D.  
Williams, of Knighton. The marble mosaic paving  
is supplied by Messrs. Maizer & Kempthorne, of  
London.

**RE-OPENING OF ST. BOTOLPH'S CHURCH, BISHOPS-  
COTE.**—On the 23rd inst. the parish church of St.  
Botolph, Bishops-cote, was re-opened, after external  
restoration. The restoration, which has necessi-  
tated the building being closed for about five  
months, has been confined almost exclusively to the  
stone-work, which was found to be greatly decayed,  
and the cost has been about 2,000*l.* Mr. Bentley  
was the architect, and Messrs. Higgs & Hill the  
builders.

## SANITARY AND ENGINEERING NEWS.

**UTTOXETER WATERWORKS.**—Mr. W. H. Radford,  
C.E., of Nottingham, has been instructed by the  
Uttoxeter Rural Sanitary Authority to inspect and  
report on the water supply of the town, and if the  
present supply is found inadequate, to prepare a  
scheme with plans, sections, report, and estimate  
for obtaining a further supply from the best available  
sources.

**THE WATER SUPPLY OF DARWEN.**—At a special  
meeting of the Darwen Town Council, on the 13th  
inst., it was by a large majority decided to purchase  
the Pickup Bank and Daisy Green reservoirs from  
the Blackburn Corporation for 60,000*l.* The agita-  
tion for an increased water supply has now ex-  
tended over two years, the alternative schemes  
being either Thirlmere reservoir of the Manchester  
or the Riddlesworth reservoir of the  
Liverpool Corporation.

**SEWAGE DISPOSAL AT WORCESTER.**—A three days'  
Shire Hall, Worcester, by Colonel Ducat, Inspector  
of the Local Government Board, into the scheme of  
the Corporation for disposing of the sewage of the  
city. Mr. Lumley Smith, Q.C., opened the case  
for the Corporation, and stated that the Local  
Government Board at first suggested irrigation, and  
the Corporation arranged to purchase twenty-eight  
acres of land at Diglis, where they would have had  
space for irrigation. The purchase of that land  
was opposed by a number of persons who were  
under the impression that there was going to be a  
sewage-farm established at Diglis. That was an  
erroneous impression. It appeared, however, that  
the Severn Commissioners wanted a portion of the  
twenty-eight acres of land at Diglis for docks in  
connexion with the Severn Navigation Scheme.  
The Corporation, therefore, desiring to promote  
the navigation scheme, agreed to retain only six  
and a-half acres, at the north end of the site, the  
Commissioners taking the rest for their docks. The  
Corporation proposed to erect on that six and a-half  
acres certain buildings, in which the sewage would  
be received and dealt with. It was estimated that the  
scheme would cost 50,000*l.* All the tanks would be  
covered in, and there would be no possible means  
of anybody being offended by the works or seeing  
the sewage. He asked the inspector to consider  
whether, in his opinion, it would be essential that  
precipitation which they proposed to carry on upon  
the Diglis site. The Corporation was advised that  
the process of dealing with the sewage in that  
piece of ground by chemicals would render the  
effluent perfectly clear and fit to go into the river.

But if the Local Government Board would not  
sanction a scheme unless there was some irriga-  
tion, the Corporation could obtain land on the  
other side of the river which the effluent could  
be passed over.—Mr. Stephens, Q.C., for the  
opponents of the scheme, objected that Mr.  
Smith had presented two schemes of sewage dis-  
posal, and not one. He asked him to declare  
which the Corporation intended to stand by,  
precipitation or irrigation.—Mr. Smith replied  
that he should call evidence on the value of the cas-  
es as he had opened it. The Inspector then pro-  
ceeded to view the site at Diglis.—At a subsequent  
sitting Dr. Dodsworth, Medical Officer of Health  
for Chiswick, described the precipitation works  
which have existed there for eleven years. During  
that time there had been no nuisance, and in wit-  
ness of his opinion the proposed works at Diglis could  
be carried out without causing a nuisance.—Mr.  
Henry Macaulay, engineer and Borough Surveyor  
of Kingston, said he designed the sewage works  
there, which were completed in 1888. They had  
been at work ever since, and no complaint of any  
kind had reached the Corporation. The effluent  
went into the river just below the works. It was  
not treated by ill-effects in any way whatever.  
Witness had examined the site at Diglis and  
had seen Hawley's plan of the proposed  
works. He thought it a most suitable position.—  
The first witness called for the opposition was Mr.  
R. W. Binns, chairman of a committee of citizens  
formed for the purpose of opposing the present  
scheme.—Mr. T. Wilesmith, a member of the Town  
Council, and Mr. A. H. Parker, an architect, gave  
evidence as owners and occupiers of property near  
the proposed works. They had reason to believe  
that the carrying out of the proposed scheme would  
depreciate the value of property in the district.  
Mr. E. Ryde, surveyor, London, said he had visited  
the site at Diglis, and did not consider it suitable  
for sewage works. If the city went on increasing its  
population, larger sewage works would be wanted.  
Witness gave evidence against the scheme. Dr.  
Swete, county analyst, gave his opinion strongly  
against the scheme. The works should certainly be  
taken further from the city. Mr. Marten, Engineer  
to the Severn Navigation Commissioners, stated  
that the site was too low down and too near the  
town, which was growing or would grow in that  
direction when the new docks were established if  
these works were not carried out. The site sug-  
gested was too small to admit of sewage works being  
constructed for a town which might be expected to  
grow very much. Mr. Stephens, Q.C., having  
spoken, and Mr. Smith, Q.C., having replied for  
the Corporation, the inquiry concluded.

**ELECTRIC LIGHTING, CHRIST CHURCH, VICTORIA-  
STREET.**—This installation has proved so far, a  
success, not only as regards the increased amount  
of light, but also in that the first cost was much  
less than gas; as the estimate for installing elec-  
tricity was about 75 per cent. lower than that for  
putting in gas-pipes and fittings. This saving is  
mainly brought about by using incandescent lamps  
be used for partial illumination. The cost of  
100 candle-power; eight of these, in out-glass  
lanterns, are suspended by flexible copper leads,  
strengthened with steel wire; on each of the side  
aisles two similar lamps, placed out of sight,  
illuminate the chancel. All the lamps can be  
lighted or turned out independently, and a few of  
16 candle-power are also fixed about the building  
to be used for partial illumination. The cost of  
running is not expected to exceed the sum  
previously paid for gas, as half the lamps can be  
extinguished during the sermon, also with the high  
candle-power lamps there is a great saving in  
renewals compared with the ordinary 16-candle  
lamp, the cost of the former being only twice the  
latter and giving over six times the light. The  
electricity is obtained from the Westminster  
Company's mains, which are run to a meter; the  
current can be shut off by a double-pole switch, and  
fusible mica-foils prevent any danger from fire due  
to excess current or a short circuit in the building.  
The arrangements have been carried out under the  
superintendence of Mr. Killingworth Hedges,  
M.Inst.C.E.

**MALDON SEWERAGE.**—The works of sewerage  
and of sewage disposal for the town of Maldon,  
Essex, were opened by the Mayor and Corporation  
on the 4th inst. The works have been carried out  
from the designs and under the superintendence of  
Messrs. R. B. Grantham & Son, of London, by Mr.  
Osenton, the contractor; Mr. John Wood acting  
as clerk of works. The Town Council has deter-  
mined to form a promenade along the frontage of  
the River Blackwater, and to lay out a recreation-  
ground in connection therewith.

**POLLUTION OF THE RIVER CALDER.**—On the  
4th inst., Mr. J. T. Harrison, M.Inst.C.E., held a  
Local Government inquiry at the Board Room,  
Earlshearth, near Dewsbury, relative to an appli-  
cation by the Souththorpe Local Board, for  
sanction to borrow 12,000*l.* for the purpose of  
carrying out a complete scheme of main drainage  
and sewage treatment. Mr. W. C. Handley, Clerk,  
to the Board, stated that the population of the  
district was about 5,750, the effective rateable val-  
ue 13,113*l.*, and the amount of the present debt  
1,530*l.* Mr. Malcolm Paterson, M.Inst.C.E., Brad-  
ford, an Engineer, produced the plans and  
sections of the scheme, and explained the  
details. The scheme is entirely by gravitation,



there being two main outfall sewers meeting at one point, and the method of treatment proposed is chemical precipitation in three tanks working separately, combined with filtration on land specially prepared to a depth of 5 ft. or 6 ft., the total area being four acres. The principal features of the scheme are (1) separation of storm-water from the sewage; (2) utilisation of the fall of sewage for mixing chemicals; and (3) the taking of the manufacturing refuse into the sewers, thus striking at the root of river pollution, a step which, in view of the terrible state of the River Calder, will doubtless be watched with interest by the West Riding County Council. The Inspector advised the acquisition of the land at once by conditional agreement, and stated that in no case would the Local Government Board sanction the discharge of sewage clarified by precipitation, without its passing over land, not even the supernatant water periodically discharged before cleansing the tanks; and further stated that with this provision he would recommend the granting of the application.

**DRAINAGE, WEST ARDLEY.**—At the meeting of the Rural Sanitary Authority of the Wakefield Union, held on the 12th inst., it was resolved to adopt the plans and estimates prepared by their engineer, Mr. Frank Massie, Assoc.-Mem. Inst. C.E., and further stated that with this provision he would recommend the granting of the application.

### FOREIGN AND COLONIAL.

**FRANCE.**—The Académie des Beaux-Arts has named the architect of the new General Consulate, Monsieur in place of the late Sir Richard Wallace. The death is announced, at Mas-Thibert, of the painter Inard, a former pupil of M. Gérôme. He was known as a painter of landscapes in the Arles district, as well as of figure pictures of local character. The Subscription Committee which is forming a statue to General Marguerite, at Sedan has decided that instead of a simple statue, there should be a monument on a large scale, which should be consecrated to all the officers and soldiers who fell on the 30th and 31st of August and the 1st of September, 1870. The Committee propose to open a competition for this, and to award a prize to the artist whose work is among the highest rank of French sculpture. The General Exhibition at Ajaccio (Corsica), to be opened in January, is in active preparation. A competition has just been opened by the Municipality of Compiègne for the enlargement of the hospital for aged men in that town. It is intended to spend 450,000 francs on the new work. The excavations have been commenced for the construction at Paris of a Hôtel to form a centre for the principal telephone services. The building will stand on ground bounded by the Rue du Louvre, Rue Jean Jacques Rousseau, and Rue Gutenberg, where the principal facade will be. The arrangements at the plan will in some degree correspond with that of the new Hôtel des Postes. The direction of the National Garde Mobile has sent an important collection of artistic objects to St. Petersburg to decorate the new hotel of the French Ambassador. Among these are twelve fine Gobelin tapestries, an immense carpet, and a very fine piece of Louis XVI. furniture from the old palace of St. Cloud. The Government has commissioned M. Guilbert Martin, the well-known Mosaic artist, to restore a Mosaic pavement discovered by Mr. Ronan near the ancient site of Tyre. These mosaics, which belonged to a Byzantine church, are to be placed in the Louvre, the room preceding the staircase of the Pavillon, Mollien. M. de Baudot has opened at the Trocadéro an annual course of instruction in architecture. He has commenced with lectures on the methods of composition of French Medieval and Renaissance architecture, and their application to modern architectural design. The new gallery of casts at the Trocadéro has just been opened to the public. The Louvre has just received two works by Delacroix, left to the Museum by the late Philippe Burty, the Inspecteur des Beaux Arts, who died in June last; these are a pen drawing called "Le Monte au Calvaire," and an album of notes, drawings, and water-colour sketches. **BERLIN.**—Nine designs for the proposed memorial church to the deceased Emperor William I. have been placed before the Emperor for approval. He has chosen a design in Romanesque style, planned to hold 1,600 seats, bearing the name of "Baurath" Schwechten, for erection. The Norwegian architect Munthe, who has built Holmenkollen, so much admired by the Emperor on his last northern trip, has received a commission to build a boat-house (in Norwegian style) in the Castle grounds in Potsdam. A hunting-box is to be built for the Emperor in East Prussia by the same architect.

**SWEDEN.**—Herr J. G. Clason, a prominent architect, in the employ of the Stockholm Building

Board, has been appointed Professor of Architecture at the Technical High College in the Swedish capital. At the last meeting of the Architectural Section of the Swedish Technological Association the question of a defined classification of tiles and bricks, according to strength, colour, and finish, was discussed, in order to obviate the frequently occurring disputes on delivery. It was decided to appoint a committee of architects and engineers to frame a set of technical regulations respecting the qualities that should be shown in tiles and bricks. The second part of an interesting work has just been issued in Stockholm, viz., Drawings of Objects in the Northern Museum, by Artur Hazelius. This part embraces Iceland, and is accompanied by 108 drawings of Norse antiquities of all kinds, as well as designs of ancient buildings, &c.

**NORWAY.**—The town of Hammerfest, situated close to the North Cape, and which was recently totally destroyed by fire, is rapidly being rebuilt. The new Imperial railway pavilion to be built at Magdeburg is to be in the Norse style, at the request of the Emperor, who took a great fancy for this style of architecture during his sojourn in Norway.

**DENMARK.**—The Danish Government has presented a Bill to the Parliament demanding a first instalment of the sum to be expended in building a Museum of Industries and Arts in Copenhagen—viz., 20,000*l.*, and an additional 550*l.* a year for ten years towards its maintenance; and also a Bill for a new Museum of Art, to cost 21,000*l.* In connection with the first-named institution, drawing and artisans' classes are eventually to be established. Various great works are to be carried out in Copenhagen, among which are the erection of a Municipal Central Electric Station, at a cost of 110,000*l.*; the making of four new great thoroughfares in the northern part of the city; the erection of two large public schools; the building of a picture and sculpture gallery; and the construction of a new spring-water aqueduct, at a cost of 12,500*l.*, the length being 5,000 ft. The Government has also adopted a scheme for rebuilding the Royal Frederic's Hospital and the Royal Children's Institute, besides the building of a new surgical college, at a total cost of 235,000*l.*; but this work will take several years to carry out. Finally, new barracks are to be built in Copenhagen at a cost of 112,000*l.* For some years past the Danish Ministry of the Interior has attempted to introduce a suitable system of heating churches in the country without disfiguring them, but none has proved satisfactory. The Ministry has in consequence commissioned an engineer and an architect jointly to elaborate a plan to attain the object in view.

### MISCELLANEOUS.

**GLASGOW PHILOSOPHICAL SOCIETY.**—Mr. W. P. Buchan, sanitary and ventilating engineer, has been elected President of the Sanitary and Social Economy Section of the Philosophical Society of Glasgow in succession to Mr. John Heyneman, F.R.I.B.A. At the meeting of the Society on the 18th inst. Mr. Buchan read a paper on "A Problem in Ventilation by Heat," illustrated with experiments. We print this paper on another page. In the discussion which followed, Professors Bottomley and Blyth and other members took part. On the motion of the chairman, Professor McKendrick, F.R.S., a vote of thanks was awarded to Mr. Buchan for his paper.

**SANITARY STATE OF CADIZ.**—The British Consul at Cadiz, in a report on the trade of that district for 1889, observes:—Taking the statistics for the last eleven years, the death-rate of Cadiz shows the high proportion of 4.6 per 1,000. Out of 2,829 deaths in 1888, 913, or 32.27 per cent., were from diphtheria, typhus fever, and diseases of this class. In ten of the most healthy streets the average death-rate during the last ten years was 19 per 1,000; in ten other streets, 41 per 1,000; in Calle Venezuela, 100 per 1,000; in Campo de Santa Elena, 102 per 1,000; in Calle Campillo de los Cloches and Calle Correo, 111 per 1,000, reaching the maximum of 115 per 1,000 in Calle San Fernando. It is scarcely credible that Cadiz, encircled by the sea, being an island connected with the mainland by a series of causeways seven miles long, should be so unhealthy, and its hygienic condition so unfavourable. The causes of this excessive mortality are the want of an adequate supply of water and the absence of a proper system of drainage. The supply of drinking water is limited, and costs 3*s.* 10*d.* per 1,000 gallons. There is no water to flush the sewers, and in summer the effluvia in the streets is often so offensive that people are forced to seek relief in the purer air of the neighbouring villages. A project is on the tapis for the construction of a proper system of sewerage on the most approved modes or plans, with a sufficient supply of salt water to regularly flush the sewers.

**IMPROVEMENTS AT BURNLEY.**—A Local Government Board inquiry at Burnley has just been held by Mr. S. J. Smith, C.E., Inspector of the Local

Government Board, into the application of the Corporation to borrow 27,000*l.* for sewage purposes, 12,000*l.* for laying out the public park, 2,100*l.* for street improvements, and 1,060*l.* for markets. The Town Clerk stated that, at the suggestion of the Inspector, in viewing the sewage works, they had agreed to amend the application to 30,000*l.* for sewage purposes, in order to add other four to the present eight tanks. With respect to the second application for 12,000*l.*, the Town Clerk explained that the land (twenty-eight acres) had been presented to the town by Sir John Hardy Thurbay. There was no opposition to any of the applications.

**THE CHANNEL BRIDGE.**—According to the daily papers, M. Renault, engineer and marine hydrographer, has presented to the Minister of Public Works and the Minister of Marine his report upon the soundings taken in the Straits of Dover. His report is favourable to the construction of a bridge over the Channel.

**PROPOSED NEW SHIP CANAL IN THE MIDLANDS.**—The North Staffordshire Railway Company, which has its Cheshire terminus at Crewe, has given notice of its intention to apply for an Act of Parliament allowing them to widen and deepen their Trent and Mersey navigation and other canals, so as to render them navigable for vessels of much larger burden. The widening and deepening of the canal will transform it into a great ship canal, and will necessitate the construction of eleven new locks. The new ship canal will provide direct communication for vessels of heavy tonnage for the whole of the populous area between the Cheshire shore of the Mersey and the Potteries of Staffordshire.

**ELECTRIC LIGHTING IN SPAIN.**—It is stated that a large central electric-lighting station has recently been completed in Madrid, at a cost of 80,000*l.*, and electricity is already being distributed by underground mains to houses at a distance of two miles. The undertaking is in the hands of an English company holding a concession from the Madrid authorities.

**ROYAL VICTORIA HALL, WATERLOO BRIDGE-ROAD, S.E.**—The "Penny Science Lectures" to be delivered in this hall during December include the following:—On December 2, Mr. E. Wethered will lecture on "Rocks seen through a Microscope." On December 9, Dr. Foster Morley will lecture on "What we get from Coal Tar," with experiments. The oxyhydrogen lantern will be used with these lectures.

**JUNIOR ENGINEERING SOCIETY.**—The presidential address was delivered to the members of this Society on the 21st inst., at the Westminster Palace Hotel, by Professor Silvanus P. Thompson, D.Sc., on "Electro-Magnetic Mechanisms." The Society's prize was presented to Mr. A. H. Tyler for the best paper of the past session, and a vote of thanks was passed to Professor Perry, D.Sc., F.R.S., the retiring president.

**ARTIFICIAL ASPHALTE.**—A Danish engineer, Herr J. Erslev, has obtained a patent for a process of making artificial asphalt. He mixed 80 to 90 parts of carbonate of ammonia with 10 to 12 parts of coal tar, and when these have been well mixed adds 100 parts of fine sand or dry clay. The whole having been thoroughly kneaded the substance is cast in blocks, and used like ordinary asphalt. The artificial substance resists changes of temperature and hot water, whilst allowing a hardness equal to the natural. It also adheres well to any material upon which it is laid.

**THE BALTIC-WHITE SEA CANAL.**—It is reported from Archangel that the preliminary surveys for the canal that is to connect the Baltic with the White Sea have been completed. The new canal will commence from the Lake Onega, as there is already a canal between the latter and the Finnish Gulf. The length of the new canal is estimated at 135 miles, of which eighty-two miles are natural waterways. It will be 63 ft. wide and 16 ft. deep, but at the locks, where ships have to pass each other, the width will be 112 ft. The cost of the canal is estimated at 7,500,000 roubles, or 750,000*l.* The fall of the canal between the White Sea and Lake Onega will be about 15 ft. Naturally, great importance is attached to the construction of this line of communication, as, apart from its strategical value, it will open up the great metal deposits and rich forests in Northern Russia to commerce.

**A LONG ELECTRICAL RAILWAY.**—A project has been mooted for the construction of an electrical railway between St. Petersburg and Archangel, on the White Sea. The length is estimated at about 800 kilometres, and the cost at 2,000*l.* per kilometre. It is proposed to work the railway from generating stations along the line. It is suggested that an electrical railway would work better than an ordinary one.

**MEMORIAL WINDOW, ALL SAINTS' CHURCH, BARBACOMBE.**—At All Saints' Church, Barbacombe, on the 22nd inst., was dedicated a stained-glass window placed in the south aisle to the memory of the late Duchess of Sutherland. The window, which consists of three lights, is the work of Messrs. Mayer & Co. The subject of it is, "The Holy Women at the Tomb."



## COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITIONS.

Nature of Work.	By whom Advertised	Prize.	Designs to be delivered.
New Court House, Peel.	Isle of Man Government	200	Jan. 15
Public Baths and Public Library.	Treasury Corporation	500	Jan. 21

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Limestone Gravel.	Heaton Local Board.	S. S. Grimley	Dec. 1
Steel Work for Bridges, Balla, &c.	Isle of Man Government	W. L. P. Perkins	Dec. 2
Alterations, Additions, &c. at Home Court, New City.	Chambers & Co. Industrial School.	Official	Dec. 3
Steel and Wrought-iron Pate for Work 105 tons.	G. W. H. Co.	do	do
Office, &c. Bristol Station.	N. E. R. Co.	W. A. Bell	do
Ten Cottages, Church Fenton, or Tadcaster.	Plymouth Corporation	Geo. J. Bellamy	Dec. 4
Paving Works, &c.	M. R. Co.	Official	Dec. 5
28 Cottages at Child's Hill.	Wakefield T. R. A.	Official	do
Supply of Ferules with Stop Taps.	G. N. R. Co.	Official	do
Shore for 12 Months.	Crest and Co. Ltd.	John Young	do
New Railway.	Halifax Corporation.	E. R. S. Macott	Dec. 8
Parkinson-lane Improvements.	Canterbury Vestry	Official	Dec. 9
Taxing Works.	do	do	do
Roadmaking Works.	do	do	do
Making-up and Paving.	do	do	do
Streets Light and Gas.	do	do	do
Readings and Paving Works.	do	do	do
Villa Residences, Elyon, &c.	do	do	do
Mortuary Buildings.	do	do	do
Removal of Dust, Dirt, Ashes, &c.	do	do	do
Sanitary Pipes, Paving, and Kerb Stones.	do	do	do
Steel and Iron Castings, Timber, &c.	do	do	do
Ironwork, Bricks, Timber, &c.	do	do	do
Works and Materials.	do	do	do
Laying out for reclamation Ground, W. 100.	do	do	do
Seepage Damp Drainage Works.	do	do	do
Sewering and Kerbing Streets.	do	do	do

## CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
New Works at Heston.	N. E. R. Co.	W. Bell	Dec. 17
Ditto (Ironfounders' Works).	do	do	do
Alterations, &c. at West Yard.	Bournemouth T. C.	F. W. Loop	Dec. 21
Artisans' Dwellings, Swansea.	The Directors	E. Bath	Dec. 20
Fireproof Mill and Office, Salford.	Fraser & Co. Ltd.	Bradshaw & Gass	No date
Iron, Steel, Castings, Timber, &c. Quay-side, Newcastle.	do	do	do
23 Workmen's Houses, near Buteopolis.	do	do	do
Colliery, Newcastle-on-Tyne.	do	do	do
Laying a Gas Main, New Kilmahann.	do	do	do
Three Cottages, Camphill, near Cardiff.	do	do	do
New Club House.	do	do	do
Mission Room, Walworth, near Newburn.	do	do	do
Widening and Slaking Two Shafts, Long.	do	do	do
Excavating and Graving, New Worldy.	do	do	do
Leads.	do	do	do
Houses & Co-operative Stores, Ashing.	do	do	do
New Premises, near Morpeth.	do	do	do
New Post-office and Postmasters' House.	do	do	do
Detached House, Harthill, Staffs.	do	do	do
Strakers & Love.	do	do	do
John Rows & Partners, Ltd.	do	do	do
The Commissioners.	do	do	do
Hyde Park, London.	do	do	do
Walter A. Hobson.	do	do	do
Hicks & Charleswood.	do	do	do
Buckton & Co.	do	do	do
Equitable Group, Soc.	do	do	do
Davidson & Bends.	do	do	do
Mr. Rathbone.	do	do	do
Ellis Jones.	do	do	do

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
Superintendent Harbour Improvements.	Westport (Ireland)	1000	Dec. 2
Secretary.	do	1000	Dec. 2
Harbour Inspector.	do	1000	Dec. 2
Town Engineer.	do	1000	Dec. 2
Chief Clerk (Sanitary Department).	do	1000	Dec. 2
Sanitary Inspector.	do	1000	Dec. 2
Surveyor.	do	1000	Dec. 2
Eastbrook (Cheshire Highway Board).	do	1000	Dec. 2

Those marked with an Asterisk (\*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv., vi., and viii. Public Appointments, p. xvi.

**THE ENGLISH IRON TRADE.**—Notwithstanding the almost complete restoration of the equilibrium in the Money Market, the effects of the recent troubles in the financial world are still being felt in the English iron market. The latter continues lifeless and weak. The Glasgow warrant market has again been flat during the past week, and fluctuations have been frequent. The other pig-iron markets have maintained their downward tendency, purchasing being restricted to the smallest possible limits. A recovery, however, is looked forward to, as works are kept regularly going with orders in hand. As in crude metal, there is an absence of new business in finished iron and steel, and the former can be obtained in the North of England at any rate, at fully 5s. per ton below the prices which ruled a fortnight ago. Steel is weaker in the north and Lancashire, and in Scotland, but still in the north-west. Further orders have been placed for ships. Engineers continue fairly active.—*Iron.*

**PRINTING A NEWSPAPER WITH A 15-TON STEAM ROAD-ROLLER.**—Owing to an accident at the gas works, the town of Middlebrough was last Saturday wholly deprived of gas for all purposes. This did not reach the ears of the manager of the *North-Eastern Daily Gazette* until ten o'clock; but a novel idea was evolved and promptly acted upon. A gang of workmen was hastily obtained from neighbouring works, and heavy iron plates were laid in the yard adjoining the printing-room, through the wall of which a large aperture was made. A 15-ton steam road-roller was then got into position, shored, and rapidly geared, and one hour only after the ordinary time of starting the powerful "Marinoni" printing-machines began work, the issue of 64,000 copies being produced without a single hitch in this unique manner.

**COLLAPSE OF A BUILDING AT NEWPORT.**—According to the *South Wales Daily News*, a serious disaster occurred at Newport on the 21st inst., resulting in the death of one man and serious injury to another. It appears that between 7 and 8 o'clock in the morning a number of workmen were engaged on the improvements in High-street, when suddenly one of the iron beams which had served as a support to the old premises, which were being taken down, gave way and the front wall collapsed, carrying with it the scaffold upon which the men were at the time working. Two of the men were buried beneath the debris, and one of them, a young man named George Davies, was killed, his neck having been broken. Another man, named Eli Sterry, was seriously injured, and was conveyed to the infirmary, where he was detained.

**MUSIC, DANCING, AND THEATRE LICENCES.**—The London County Council have just notified that in future they will not entertain any application for a new licence for music, dancing, or stage plays, unless the owner or lessee of the building in question possesses a Council's certificate under the Act of 1875, or in the case of a building in course of construction, a provisional approval by the Council. Such provisional licences granted during the current year will not necessarily be renewed next year, as the Committee will base their decisions upon the way in which they find their requirements have been satisfied.

## LEGAL.

## IS A "SKY-SIGN" A TEMPORARY STRUCTURE?

At the Marylebone Police-court on the 21st inst., Mr. George Rolle, the proprietor of the Lord Elgin Hotel, Maida Vale, was summoned by the London County Council for setting up an erection of a movable or temporary character, the same not being exempted by the first part of the Building Act of 1855, and without having first obtained a licence. Mr. Horace Ivory, who appeared in support of the summons, in opening the case, said these proceedings were being taken with the object of testing the question whether the existing law was sufficient to deal with the erections which were now generally known as "sky-signs," which were erections for advertisement purposes on the roofs of houses. As these erections were a possible additional danger to the public it was quite clear that they should be under the control of the local authorities. He would call attention to the fact that the words forming the advertisement in this particular "sky-sign" were 5 ft. in length; the results might be serious if in a gale one or more of these letters were blown down into the street. The sign on the defendant's public-house was 30 ft. above the top of the house and 45 ft. wide. As to whether this "sky-sign" was an erection of a temporary nature, if it was not, then it must be a permanent addition to the house, in which case the District Surveyor ought to have received notice of the work, which was not done.—Mr. A. Davaston, surveyor under the County Council, said he had examined the "sky-sign" in question. Each of the wooden letters would weigh about 3 cwt. No application had been made to the Council for a licence to put up the erection.—Mr. Forrest Fulton, for the defence, contended that the facts disclosed showed that the section under which the summons was issued did not apply in this case. The section dealt exclusively with wooden erections, whereas this sign was composed for the most part of iron. Mr. Lewis Solomon, architect, deposed that the sign was put up in the most substantial manner, and with a yearly supervision would probably remain safe for ten years.—Mr. Mead, who had taken time to consider the questions raised, held that the term "wooden" applied to the entire sentences in the section, and that the words "structure" and "erection" were interchangeable terms. He was also with Mr. Fulton on the other point, that this sign was not of a movable or temporary character. He, therefore, dismissed the summons, with 44s. costs.

## WIDTH OF ROADWAY: WHAT IS A NEW STREET?

At the Woolwich Police-court last week, before Mr. Kennedy, the magistrate, Mr. James Mackintosh, the lessee of some building property fronting Albert-road, North Woolwich, was summoned by the London County Council to compel him to put back the dwarf wall of the forecourts to some dwellings recently erected alongside the said road, as not being 20 ft. from the centre thereof. The road was made up and taken over by the Local

Board two years ago. It has a footpath on the side adjoining the buildings, but none on the other, which is merely the fence of the North Woolwich Railway, its total width being 31 ft.

Mr. Mackintosh is the building lessee of the lands, which belong to Messrs. Kennard, and has built three terraces of artisans' dwellings to front the same about 8 ft. inside the fence dividing the road from the property, and had put up a dwarf wall (which he intended to continue the whole length) in front of the houses 2 ft. inside the road footpath, and parallel with the old fence; thus voluntarily giving up a strip of land to the road, which it was claimed was not a new street or road within the meaning of the Metropolitan Building Acts. The London County Council served him with notices to pull down the same, and summoned him for not doing so, claiming that it must be put back to 20 ft. from the centre of the road, or about 3 ft. more than he had arranged, which he declined to do, acting on the advice of Messrs. Tapp & Jones, of Westminster, the surveyors for the owners.

The case on behalf of the lessee was argued by Mr. Scrutton, barrister, and in the result, the magistrate dismissed the summons, with costs, against the London County Council, and refused to grant the latter a case for appeal.—*Communicated.*

## MEETINGS.

## MONDAY, DECEMBER 1.

Royal Institute of British Architects.—Ordinary General Meeting, 8 p.m.  
Society of Engineers.—Mr. J. F. Andrews on "Ship Casings for Dock Basins and Dry Docks," 7.30 p.m.  
Society of Arts (Cantor Lectures).—Professor Vivian B. Lewes on "Gaseous Illuminants," II, 8 p.m.  
Victoria Institute. Professor Hull, F.R.S., on "The Geology of Egypt," 8 p.m.  
Clerks of Works' Association (Carpenters' Hall).—Monthly meeting, 8 p.m.  
Royal Institution.—General monthly meeting, 5 p.m.  
Liverpool Architectural Society.—Mr. T. Harrett Harrison, F.R.I.B.A., on "House Drainage," 7 p.m.

## TUESDAY, DECEMBER 2.

Institution of Civil Engineers.—(1) Further discussion on the paper by Professor John Milne, F.R.S., and Mr. John McDonald on "The Vibratory Movements of Locomotives," (2, time permitting) Mr. F. E. Robertson on "The Saker Being at Benares," (3) Mr. E. W. Stonely on "The New Chittavati Bridge, Madras Railway," 8 p.m.  
Society of Biblical Archaeology.—8 p.m.  
Manchester Architectural Association.—Mr. G. H. Willoughby on "Terra-Cotta: its Advantages Relative to Town and City Buildings," 7.30 p.m.  
Glasgow Architectural Association.—Mr. W. J. Mill, on "Ornament," 8 p.m.

## WEDNESDAY, DECEMBER 3.

Society of Arts.—Mr. James Dredge on "The Chicago Exhibition, 1893," 8 p.m.  
British Archaeological Association.—(1) "The Epinal Glossary," by Mr. W. de Gray Birch, F.S.A.; (2) "Notice of a Brass recently discovered at Gloucester," by Mr. Cecil Davis, 8 p.m.

## THURSDAY, DECEMBER 4.

Society of Antiquaries.—8.30 p.m.  
Royal Archaeological Institute.—Three papers, including two by the Rev. Precentor Venables.



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# The Builder.

Vol. LIX. No. 2495.

SATURDAY, DEC. 6, 1890

## ILLUSTRATIONS.

Decorative Painting, Red Cross Hall, Southwark.—Designed by Mr. Walter Crane..... *Double-Page Ink-Photo.*  
Barfrestone Church, Kent: Details.—Drawn by Mr. Alan C. Walker..... *Four Single-Page Photo-Litho's.*  
Stake Farm, near Sevenoaks, Kent.—Mr. F. M. Simpson, Architect..... *Single-Page Ink-Photo.*  
Gamekeeper's Lodge, Sidbury, Sidmouth.—Mr. Walter F. Cave, Architect..... *Single-Page Ink-Photo.*

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### From Athens.



HE work of preserving the Byzantine mosaics in the church at Daphne, near Athens, is now well in hand. Towards the middle of summer Messrs. Salvati & Co., of

Venice, at the request of the Greek Government, sent a competent craftsman to undertake the task of removing the damaged mosaics in the dome, with a view to refixing them in their places when the structure had been made thoroughly secure. A grant of ten thousand drachmas was voted by the Chamber towards the cost of this work. The idea of taking these mosaics to Athens and permanently exhibiting them in the museum there has, we are glad to say, been abandoned, and, acting under the advice of Dr. Dörpfeld, the Director of the German Institute, himself a practical architect, and of a committee of competent persons appointed to confer on the subject, the dome, which is cracked in many places, and quite unsafe, will be taken down and rebuilt on the same lines, and the mosaics refixed exactly in their old places, without being restored in any way. A light iron gallery will be constructed round the dome at the level of the string-course, in order to enable students to get close enough to study their technique. Access to this gallery will be obtained from the later bell-tower on the north side.

The mosaics in question consist of figures, a little over life-size, of sixteen prophets, which have been placed between the windows, and of the large bust of Christ, which here, as in all Byzantine churches of this period, occupies the centre of the dome. This bust of Christ is enclosed in a circle, the outer diameter of which is 15 ft., and the length of the head alone, measured to the point of the beard, is 6 ft. 6 in. The prophets have been very much damaged, and the greater part of some of them is completely gone, whereas the central Christ is almost entire, one corner only having disappeared, but the eyes have been obliterated by the bullets of the Turkish soldiery who, during their occupation of the

monastery at the time of the Greek Revolution, amused themselves by using this head as a target for rifle shots. These soldiers also contributed to spoiling many of the other mosaics by lighting fires in the church, under a mistaken impression as to the nature of the gold cubes, and with the idea that the heat would melt the gold, and make it drop down.

Between the Christ in the centre and the prophets at the sides extends a large field of plain gold cubes which is now being removed in large squares. The Christ will be taken down in one piece and each prophet removed separately. The method employed is to cover the face of the mosaic with a thin coat of plaster of Paris, and on this is glued a stout sheet of canvas. The piece is then gradually detached from the wall by cutting it away from its bedding, and resting it on a wooden frame or stretcher, which is made exactly to fit, and on which it remains, after the whole of the plaster has been cleared away from the back of the cubes, till the wall is ready to receive it again. A new fresh wet cement groundwork will then be prepared on the wall, the frame to which the mosaic is fixed will be pressed firmly on to it, so as to let the cement get well into the joints between each cube; it will be left to set hard, and, the frame and coating having been removed, the mosaic picture will be once more exposed, firmly fixed on to the new wall.

No attempt will be made to restore the mosaic, even parts which have gone where the accurate completion of the subject is quite obvious; but it will be possible, provided a good man is employed, to complete in fresco what is wanting in mosaic, and so obtain a better idea of the original *tout ensemble* of the scheme, but this will have to be done very carefully, otherwise it is sure to detract from, rather than add to, the general effect of the whole.

The other mosaics in the church, which are in a more or less insecure state, will also be attended to, and so we may hope to have preserved, for some considerable time, this valuable series of Byzantine mosaics, of probably twelfth-century date, which otherwise would have disappeared in a few years through inattention and neglect.

We may add that the British School at Athens have been fortunate in securing a number of coloured drawings of the most

interesting of these mosaics, made before they were disturbed, and these will form an important item in their series of drawings of the Byzantine architecture of Greece.

The British School is again at work at Megalopolis on the site of the ancient city. These excavations, which were started last spring, were discontinued during the hot months of summer. Operations have, in the meantime, been suspended at the theatre, and attention is at present being directed to the stretch of level ground on the north side of the river Helisson, where the first digging took place in the spring, and which then had to be postponed owing to the disturbance of the standing crops. On account of the continuous and heavy rains very little has yet been done, but the long stoa lying some distance in from the banks of the river, and running east and west, parallel with it, has been uncovered over its whole length, a distance of 500 ft. It has had two rows of columns, the inner ones Ionic and the outer Doric; but only the foundation-stones of the columns are *in situ*, and one or two of the Ionic bases, and two or three courses of the back enclosing wall. Portions of the columns are, however, lying scattered about, but no capitals have yet been unearthed. In the length of the back wall there are two flat recesses, or exedrae, separated from the stoa by triple openings, which in one case has double columns between each bay. This stoa is in all probability the one alluded to by Pausanias as the stoa of Philippos, and which he describes as running along the north side of the Agora.

With regard to the theatre, the General Ephor of Antiquities has stipulated that the entire area of the orchestra and the seats, where in position, shall be completely excavated. Probably few additional facts will be gained from this work, which, on account of the depth of soil to be removed and the distance to which it will have to be taken, will entail a considerable amount of labour and consequent outlay, but it will ensure permanency to what has already been done, and make the general scheme of the theatre apparent to all. Satisfactory arrangements have now been concluded between the School and the Government, which will enable this work to be undertaken in the spring, and it will, when finished, permanently identify the



British School at Athens with the complete excavation of the site of the largest theatre in Greece.

There are prospects that the excavation of Delphi will, after all, be undertaken by the French School. We believe that it has already got a concession from the Greek Government, but the vote of the necessary grant of money to buy up the present village of Castri, which covers the site, has still to pass through the French Chamber. Meanwhile, the recent heavy rains have washed away several of the houses in the village, but doubtless the inhabitants will rebuild them at once in order to secure their rights to compensation when the work goes on.

The German Institute is going to undertake excavations at Magnesia, in Asia Minor. They will be under the immediate charge of Dr. Humann, and Dr. Dörpfeld will visit them at intervals.

Drs. Schliemann and Dörpfeld were at Hissarlik most of the summer. The results of their work have not been published yet, but we understand the topographical researches have been satisfactory, although no important objects have been found.

The Greek Archaeological Society are excavating on a site to the west of the Tower of the Winds, and between it and the Roman Agora Gate. They have unearthed a large stoa of Roman times, with plain pillars of the Ionic order, raised two steps above a paved court, which has an open water-channel running round it. On the south side the stoa is double, and eleven bays are already visible towards the central court. Next the Tower of the Winds the stoa is single, and only about half of it is yet excavated. In the centre of this side is the Propylaea, with three doors, the eills of which are raised three steps above the level of the stoa. These steps are very much worn, and have been roughly repaired at a later period. On the excavated side of the Propylaea are four small chambers opening on to the stoa, and somewhat similar to those in the Stoa of Hadrian close by. If the Propylaea is situated in the centre of the east side, as one would naturally suppose, there will be eleven bays towards the court on this side also. On the stylobate, between two columns on the south side, are four hemispherical sinkings in the stone. Three of these are of progressive sizes, and the fourth is similar to the largest of the three. They were probably measures of some description. The work of excavation is still being proceeded with.

In the Ceramicus, outside the Dipylon Gate, where the Archaeological Society are also digging, some new funeral reliefs have been discovered. Negotiations are still in progress between the Ecclesiastical Synod and the Society regarding the removal of the small church of the Holy Trinity, the existence of which has interrupted the excavations on a portion of the site. This church is not old, and it contains nothing of sufficient interest to warrant its preservation.

The two statues found during the recent excavations by the Government authorities at Rhamnus, in Attica, have been set up in the vestibule of the National Museum at Athens. The one is a female figure of over life-size, and of fourth-century (B.C.) workmanship. It may be a statue of Nemesis, and is by a hitherto-unknown artist, possibly a local man. The other, also a female figure, and probably a portrait, is smaller, and of the Hellenistic period. Neither of them are of great artistic merit or importance, but are interesting because they have been found with their original bases, on which are inscribed the dedicatory inscriptions. The base of the larger one is a shallow square block, with the usual small single moulding of the time running round the top and bottom, and it rests on a lower plain block of somewhat larger dimensions. The base of the smaller statue is a simple square stone, without mouldings of any kind. In both cases the statues have a solid piece of marble under the

feet, which is let in to a sinking in the base stone.

Excavations have meanwhile been discontinued at Rhamnus, but they will be resumed in the spring, when the sacred way leading to the sea will be examined.

Steady progress has been made during the summer with the arrangement of the National Museum. Two of the large heads and a portion of the sculptured drapery of one of the figures belonging to the lately found temple statues have been brought from Lykosoura in Arcadia, and are now on view in one of the galleries. One of the magnificent Corinthian capitals of the fourth century (B.C.) from the interior of the Tholos of Polykleitos at Epidauros, and perhaps the finest of all the types of this order, has been brought from the local museum at the site, and set up beside the other sculptures from that place.

The numerous marbles of various kinds which were stored in the vaults at the Varvakeion, where was formerly the museum of the Archaeological Society, have now been removed to the National Museum and are being incorporated with the collections there.

The sculpture galleries are being rearranged and many additional objects exposed to view. There is, however, a danger of overcrowding the walls, especially in the hall of later sculpture, which contains many interesting examples of the later Greek and Roman times. Here indifferent Roman busts are being posted about on brackets all over the walls. They had far better be consigned to an obscure position in some subsidiary gallery or corridor, where they would not interfere with other and more important things, and where they could be consulted by those who have need to do so.

The great hall of the funeral stela is now in complete and permanent order, and three more rooms devoted to additional examples of these will shortly be opened, thus making this collection the finest and most extensive of its kind in existence.

A large number of bronzes and terra cottas have been arranged in two rooms in the right wing of the Museum, and they will before long be also open to public inspection.

Great credit is due to M. Kavvadias, the General Director of Antiquities, and to his assistants, for the untiring energy with which they are devoting themselves to the arduous task of arranging such a vast collection, which is increasing day by day by the addition of new finds from all parts of Greece.

#### NOTES.

**I**N the current number of the *Nineteenth Century* Mr. Frederic Harrison makes what may be called an impassioned appeal for the restoration of the Elgin Marbles to Greece. He does not propose that they should be placed *in situ* on the Parthenon again, which would be in fact impossible, but that they should be placed in a museum at Athens so as to be seen in close contiguity, at all events, with the building to which they belonged. This idea, we know, has been mooted frequently of late years in this country, though not publicly; and under present circumstances there is no doubt a good deal to be said for it. Athens, as Mr. Harrison says, is now a more central archaeological school than London; the Athenian atmosphere is no doubt more favourable to their preservation than that of London (if London can be said to have an atmosphere), and no doubt also the Greeks of the present day do value these great records of their past. But there are considerations on the other side which Mr. Harrison entirely ignores. No doubt, if any one at the present day were to pull down and carry off the sculptural work of any ancient architectural monument, there would be a hue and cry raised against him. But what were the circumstances at the time? No authority on the spot cared a rush for the marbles then. Isolated individuals may have done so (according to an instance quoted by

Byron in the notes to "Childe Harold"), though from merely sentimental and patriotic reasons, and without any real knowledge of their artistic value. But at that time the sculptures of the Parthenon were in constant danger from wanton mischief. The Turkish soldiers, it was known, used the figures as marks for shooting at. Mr. Harrison asserts that Byron "did not say a word too much" in his poetic denunciations of Lord Elgin's proceedings. Byron said a great deal too much; he also was entirely ignorant of the artistic value of the sculptures, and careless of it; all he wanted was that, as a matter of sentiment, Athena's shrine should not be despoiled. No one knew their value till they were brought to London, when Fuseli and Haydon were chiefly instrumental in making it known. It is not too much to say that had the sculptures not been then brought to London, the enormous influence which a knowledge of them has exercised on modern sculpture and on our estimate of Greek art would never have come into existence at all. Before the time had arrived when all the educated world learned to take such deep interest in Greek art as it now takes, the sculptures would have suffered far more severely than they have already suffered. Whatever may be said as to the motives of Lord Elgin and the manner in which the "loot" was effected, the fact remains that he practically saved them, and that the English taught the world their value, which their then native possessors knew nothing of. All these considerations ought to be borne in mind in reference to any question of restoring them to Greece; and Mr. Harrison's appeal ignores them all.

**T**HE Mansion House United Association on Railway Rates seems to have an insatiable appetite for "returns." At their meeting last Friday a resolution was passed urging Parliament to require returns from the railway companies showing the rates charged for the conveyance of staple articles of merchandise, and the tonnage of the articles carried at these rates during 1889 between the most important trade centres in the United Kingdom. Seeing that a large proportion of these particular rates would be special ones, we really cannot see that any good purpose would be served were the returns obtained, as they could hardly be of any greater value in the determination of maximum charges than many of the tables of figures already submitted. The Board of Trade have a right to assume that in the course of the long inquiry that they held, the full state of the case was laid before them, and it is extremely doubtful whether they will advise Parliament to demand still further returns. Their own proposals, in spite of the opposition of the railway companies, do not appear to be acceptable to the Mansion House Association. At the meeting referred to it was resolved that in the opinion of that body the proposed classifications and schedules, if authorised, would enable railway companies to increase their charges upon merchandise. This resolution concludes by stating that the increase would be due to a large extent to the charges from station terminals, which the Association does not admit to be legal. Now, although we ourselves have never believed in the legality of these charges under the old law, it seems increasingly evident that Parliament has yielded the point, and that their legislation is now inevitable under the new system. Future effort, therefore, should be in the direction of securing the best possible terms; and, seeing that the Board of Trade have so curtailed the powers sought for by the railway companies as to cause the latter very grave apprehensions, the Board will probably be rather surprised at the attitude of the Association; for they conclude by stating that they are unable to accept the proposals of the Board as being just and reasonable, and will use every means in their power to prevent their authorisation in their present form by Parliament.

\* These were referred to and partially illustrated in a letter from Professor Atchison published in this journal a fortnight since.



AT the meeting of the School Board for London last week the question of employing outside architects in the designing of schools was canvassed at great length. In reference to the difficulty of keeping pace with the demands, an important communication from the Board's Architect, Mr. Bailey, was read, which seems to show conclusively that in some cases at all events delay has arisen from causes outside of the architect's office. "I apprehend," wrote Mr. Bailey, "that my duty, as the Board's Architect, is to build the schools upon the sites acquired and definitely settled on; but until I receive from your land-surveyor a proper site plan, with levels, I am, as a matter of fact, unable to complete my plans." Mr. Bailey then went on to point out that in one case the question of building a school for 800, since increased to 1,000 (thus involving a new type of plan), had been in abeyance from January 1887 to October 1889, though the site had been in possession for years. In the case of four out of fifteen sites in possession, no numbers had yet been settled on, so that he was without instructions. One site is in abeyance, and for another he had no site plan. Mr. Sharp, in the course of discussion, moved that the Works Committee be instructed to have six new schools planned and built under the superintendence of three outside architects. An amendment by the Rev. Copeland Bowie, "that the Board adheres to its present practice of having schools planned by their own office staff," was ultimately carried by twenty-four to thirteen. In the course of the discussion it appeared that some members were of opinion that it was impossible and absurd to maintain their own Architect's department and employ outside architects as well. We do not see that it need be so. The Board's Architect would be in the position of a consulting architect and an authoritative referee as to whether the "outside" plans were satisfactory. There is no doubt a natural feeling that it would be a kind of confession of weakness to give up this system after having carried it out for so long; but the fact remains evident that the Board are putting upon their present Architect, as they did on his predecessor, more work than any one man can properly look after. There appears to have been an idea that school plans should have been duplicated in order to save labour, but Mr. Bailey remarks that the best type of school for duplicating has only recently been erected. We may observe on this head, what Mr. Bailey no doubt knows as well as we do, that duplicating a building for another site than that for which it was designed can never be really satisfactory, as every site has its own special conditions. The proposition is in itself a confession of the unsatisfactory character of the present system.

THE judgment of the Chancellor of Rochester in regard to the question of the peal of bells for St. Peter's, Deptford, is of some importance to those who are concerned in church building. It was claimed on behalf of the bells that the hanging of a peal was intended before the church was consecrated, and was only omitted because the funds for the purpose were not at the time forthcoming. The Chancellor set this aside on the ground that the then parishioners might, if they pleased, have approved the bells, or they might have petitioned the Bishop not to consecrate the church with the bells. He could not legislate in regard to what might have been done under circumstances which had not occurred. Going into the memorials which had been presented on both sides, he found that there were 821 houses in the parish, of which 41 appeared to be empty, and of the remaining 780 it appeared that 212 occupiers were in favour of the bells and 241 against them; the remainder either were neutral or it had not been possible to obtain their views. Taking the area within a furlong of the church, which would naturally be most directly affected by the bells, there appeared to be, out of 248 tenanted houses, 131 occupiers who were against the bells and

only 55 in favour of them; while in the same area 44 persons, owners of long leases of 93 houses, objected to the bells as "calculated materially to lessen the value" of their property. Taking all these considerations into account, the Chancellor refused the faculty. The petitioners, he thought, were seeking what might be called a luxury, the opponents apprehended a nuisance. "If the faculty is refused no parishioner will be the worse; but if the faculty is granted, a great many will be exposed to more or less annoyance." Considering that some people have a passionate love of bells and bell-ringing, it is perhaps hardly fair to say, except in a technical sense, that they would be none the worse for being deprived of them. But the judgment, broadly speaking, seems to have been for the greatest happiness of the greatest number; and the result seems to give prominence to two facts: (1) that a peal of bells is a less popular form of entertainment than it used to be, and (2) that a majority in a neighbourhood who object to the importation of a peal into their midst are very likely to get their own way if they set about it systematically.

AT Berlin, Professor Koch is to have his own "Institute for Purposes of Research," and the sites for this Institute will be given him, not, as first proposed, by the municipal authorities of the capital, but by the Prussian Government. This new Institute will have two distinct divisions, (1) the "bacteriological" and (2) the "clinical" one. For the present, provisional localities will be used, and the plans for such (made with a certain amount of celerity) have already been approved of by the learned Professor. For the purposes of Division I. an old building will be adapted, in which laboratories for analytical, chemical, and microscopic research will be fitted up, a first-class photographic atelier attached, and a number of studies (for both German and non-German medical men visiting the Institute) arranged for. For Division II., a small hospital, with some 130 beds (but with extensive accommodation for doctors and nurses) is to be erected with all modern hygienic conveniences, on the isolated barrack system. Both provisional localities will be situated in close connection with the old State hospital, the "Charité." The total cost is estimated at about 870,000 marks.

DR. BALLARD'S Report to the Local Government Board\* on a special prevalence of enteric fever during recent years in Chester contains some important and interesting information as to the possible part played by the river Dee in relation to the sewerage of the city. From the Report, which is a long one, we extract the following passage:—

"Between the ancient city and Handbridge there is a bridge over the Dee, and at about this spot there is a 'causeway or weir' constructed to dam back the waters of the river for the use of some mills in this situation. At ordinary times the tide only rises as far as this weir, but at spring tides the tidal flow surmounts the causeway, and then the river is tidal for at least fourteen miles above it. About these tides and the condition of the river below the causeway something more requires to be said. The Dee is one of the few English tidal rivers in which the spring tides rise rapidly with a 'bore' or wave. In the Dee this is about 3 ft. 6 in. high, and it sweeps up suddenly about an hour and twenty minutes before high water. This, then, is the time which elapses between low and high water in the Dee at Chester. The wave sweeps before it, in its first rush, all movable deposits in the bed and on the banks of the stream. The first rush does not overtop the causeway, but in a short time the rising tide does so, and the tidal water carries with it much of the fouling material which the 'bore' wave had swept before it up to the weir. I am informed by Mr. Enfield Taylor, C.E., who for the last twenty years has been observing the condition of the Dee, that at high spring tides the water below the weir runs up at the rate of from 5 to 7½ miles an hour; above the weir, however, it is somewhat slower in its rise. The rate of fall of the

tide above the weir is only about one mile in three hours. Another matter that must be mentioned is that the river below Chester has, from very many years of neglect, become to a great extent silted up by deposit of sand in banks. Passing down the river from Chester the first considerable sand-bank, which renders the river shallow, is met with a short distance on the Chester side of a bend of the river at Saltney. At this spot, on June 15, I measured the depth of water over the bank, and found it only 4 ft. I was informed by fishermen that it was sometimes even less, and that at times they had seen the sand-bank exposed. Above this bank, or between this spot and the weir, the water is fairly deep, even at low water. Between the time of low water and the time when the tide begins to rise the water between these places is nearly stagnant. It is into this section of the river that the sewage flows continually from all the southern part of the borough except Saltney (the sewage of which village is discharged a little lower down, but is necessarily washed up by the 'bore'), and into this section also is discharged, at certain intervals, the effluent of the sewage works on the northern side."

In a subsequent portion of the report we again come on the difficulty of midden privies, and the unwillingness of the owners to incur any expense in having them emptied:—

"The Sanitary authority undertake the removal of the contents of both privies and ash-pits on request, but they charge the householders with the cost of the work. The cost varies with the quantity of material to be removed, from 1s. 6d. to 3s. or 4s., and in some instances to a very much larger sum. The result is that the poorer inhabitants of houses, who can ill afford these charges, delay the cleaning of both privies and ash-pits as long as they possibly can, especially where the filth has to be carried through the house; and it is in the case of these poor people, whose privies and ash-pits are the nearest to their houses, that the retention of this filth is most dangerous. Removal, in some instances, I found neglected for six or seven months."

How can it be expected to be otherwise, when uneducated and poor persons are allowed the option of deferring an operation for which they have to pay money? Of course they do it as seldom as possible, to the detriment of the community as well as themselves. The removal, whether charged to them or not, should in their own interests and in those of public health be compulsory.

A REPORT by Dr. Parsons, to the Local Government Board on an epidemic of pneumonia at Scotter, Lincolnshire, and in the neighbouring places, seems to refer the disease to what may be called biological rather than insidious influences. The report includes, however, a statement from the local surgeon, Mr. Frankland Eminson, in which insanitary conditions are regarded as the cause of the commencement and spread of the disease; and we observe that Dr. Parsons himself, though differing from Mr. Eminson's view generally, admits some statements which seem to support it: e.g.:—

"The western end of the village street is drained by two sewers, which discharge into the 'parish ditch,' a watercourse which finds its way into the river Eau. Comparatively few of the houses at this end of the village are connected with the public sewers, those on the north side of the road draining separately, or two or three by a joint outlet, direct into the 'parish ditch.' The house drains in this part of the village are of very rough construction, being made of field tiles, or of brick, with rough untrapped inlets. Some of the inlets are large, square, brick catchpits, locally called 'cesspools'; others are furnished with cast-iron 'D' traps, generally loose and non-efficient. The house drains in the south end of the village are described as having been formerly of similar character (some seem to be still), but considerable improvements have been effected by the Sanitary Authority in the drainage of this portion of the village since the occurrence of the epidemic, and many of the old inlets have been replaced by earthenware trapped gullies. The inlets are usually at some little distance from the houses; in one instance in Scotter was one found indoors; this was in the workshop occupied by a man who had died of pneumonia. . . . The water supply is obtained from shallow wells; in the lower part of the village the water level is not more than 2 ft. or 3 ft. below the surface. The wells are stoned only with loose masonry, and many of them are near to privies, farmyards, leaky drains, and such like sources of contamination."

IN the last number of *The Lancet*, Mr. A. L. Griffith, in a letter headed "Diphtheria in Kensal Town," makes some

\* Eyre & Spottiswoode; Adam and Charles Black, Edinburgh; Hodges, Figgis, & Co., Dublin.



very strong remarks as to the close, he even seems to imply, the necessary connexion of diphtheria with bad drainage. "Until diphtheria makes its appearance," he says, "there is no suspicion of imperfect drainage; but once established drains may be found faulty" ("will be" is perhaps rather what is meant). He then gives the following case from his own practice:—

"About five years ago I was called in to attend a family of six children and two adults. They lived in two upper rooms of a house, using the back one principally for the children. They had always noticed a very unpleasant smell in this room. The first child attacked was the worst case of diphtheria I ever saw. . . . Half of the children had this disease, the other half had scarlatina; the mother also had a bad throat, and aborted; she was kept in the front room. The whole family recovered. I suspected the drains, my theory being that the warm air of the back room drew the foul air from the drain up the stack-pipe of the wash house along the gutter into the window. The drains were examined, and found to be improperly trapped, and the connexion with the sewer imperfect; this was at once made good, and all smells were removed."

In regard to a theory set forth by another correspondent in *The Lancet*, that the disease is due to damp, Mr. Griffith thinks that there may be a great deal of truth in this. Of course, it may be added, defective drainage often causes damp in the foundation of a house as a concomitant evil.

THE recent "cold snap," to use an American expression, has drawn the attention of many persons to weak places in their houses. For, unfortunately, the ordinary builder's ordinary house is suited only for temperate weather. As soon as a hot midsummer day comes it is impossible to be cool in it. When a sharp frost arrives everyone is shivering. There are, indeed, some points in which householders are themselves to blame. Shutters, in many persons' opinion are not needed, whereas they will keep out too glaring a sun in summer and too keen a frost in winter. Again, too, when persons have a fairly well-built house erected for them, they too often oblige the architect to put in such things as windows opening to the ground, with which no room can be warm in winter. Again, how seldom also do we see double windows or an extra window put up in winter as in Germany and France? The fact is, the so-called practical Briton is the most careless of men in regard to his house, and puts up with all sorts of inconveniences as if it was impossible to prevent them.

THE project to make a line through St. John's Wood appears likely to meet with opposition. The Manchester and Sheffield Railway Company desire, it seems, to make an open cutting through Lord's Cricket Ground. Probably they have no real desire to do this, but by asking for much they may obtain less, since Parliamentary applications are conducted somewhat on a bargaining principle. If the terminus were placed near the Marylebone-road, and the line taken under St. John's Wood through a tunnel, the inconvenience to the district would be reduced to a minimum.

ONE of the central points in the winter exhibition of sketches and studies at the Society of Water-colours Gallery (opened this week) is a study by Mr. Holman Hunt for a rather mystical subject from an "Early English Poem" (303), a study made out in white lines and touches on a grey paper. It is very conventional and mediæval in character, looking like a cartoon for stained glass, but is a remarkable work of its kind. Many of the exhibits are, as usual, finished drawings and not sketches or studies, including Mr. Tom Lloyd's "First Breath of Autumn" (13), a Thames-side scene with a very big dog and a very tall young lady looking out of a gate; Mr. C. Robertson's "Loot" (46), a large Arab interior with a number of figures; and Mrs. Allingham's

various beautiful little works, which are as finished as usual, the most beautiful perhaps being "Farringford Dairy, Freshwater" (168). If it be said that such exquisitely refined rustic figures are not often met with in real life, the more thanks to Mrs. Allingham for inventing them. Among fine works which belong more to the "sketch and study" order may be mentioned Mr. Hunt's "Warkworth—Sunlit Shower" (161), perhaps a little too vague in the attempt to give the blotted effect of landscape seen through a shower; Mr. Colin B. Phillips' "Great Landslip, Loch Ridden" (91); Mr. R. W. Allan's "Kirchweih" (19) and "A Scotch Washing" (33); Mr. J. Parker's "Poppies" (98), a lovely study of a girl; Mr. Eyre Walker's "Old Farmstead" (109); Mr. David Murray's "Mid-day" (193); Mr. Albert Goodwin's "Ponte Vecchio, Florence" (243), a study of night effect; and Mr. Charles Robertson's "The House—tops, Damascus" (337), a study of an Oriental city from a new point of view. "Mr. Goodwin's "Afterglow in the Mediterranean" (185), a very large work, is powerful enough in the effect of sky and sunset light, but the sea is hardly a success. The same artist sends a beautiful little study of "Maidstone" (20). One corner of the room is occupied by a selection of the works of the late Mr. Arthur Glennie, who has long contributed studies of ancient Rome and its neighbourhood to the Society's exhibitions. Mr. Glennie drew ancient architecture admirably, and the collection of drawings shown here, though a little hard and antiquated in style, are of great interest as refined and faithful representations of the localities and monuments illustrated.

A GOOD deal has been said lately as to the desirability of architects becoming practised in modelling, and it will be of interest to those who sympathise with this view to hear that Mr. Conrad Dressler, the well-known sculptor, has opened evening modelling classes at his studio for the especial use of architects and painters. No one could be more capable of giving instruction in this class of work than Mr. Dressler, who, as some of our readers are aware, has devoted a good deal of attention to the modelling of decorative work.\*

#### LETTER FROM PARIS.

A GREAT deal of feeling has been aroused in the artistic world by the sudden dismissal from his position of M. Coquart, for many years architect to the École des Beaux-Arts and the Cour de Cassation. This step has been taken suddenly and without notice by M. Yves Guyot, Ministre des Travaux Publics, who holds also in his hands the direction des Bâtimens civils. The excuse for this high-handed measure is apparently that M. Coquart has exceeded the expenditure intended on the Cour de Cassation, and has been too dilatory in the forwarding of the work for the enlargement of the École des Beaux-Arts. The decision is regarded here as a most unjust one, and the manner in which it has been carried out, without warning or without any opportunity for the architect to justify his procedure, causes a general anxiety as to the whole position of architects under the present Government. In regard to the Cour de Cassation, the Grande Salle d'Audience, the decoration of which is carried out in a most elaborate manner and with a great amount of gilding, has after all only cost 25,000 francs, or 45 francs per square metre, which can hardly be considered an extravagant sum for work of that importance. In regard to the École des Beaux-Arts, M. Coquart had transformed the Hôtel de Chimay, bought for the purpose of enlarging the École, and utilised the existing materials in such a manner as to realise a very considerable economy in the work in comparison with what had been expected. M. Coquart has lived the life of an artist devoted to his art, and has amassed no fortune out of his professional labours, a circumstance which renders the blow

\* Particulars can be obtained from Mr. Dressler at his studio, 36c, Gêbe-place, Chelsea.

all the heavier to him. The Parisian press in general has sided strongly with him, and the pupils of the École des Beaux-Arts, in conjunction with the members of the Institut (of which M. Coquart is also a member), have addressed a strong remonstrance to the Government against this procedure. The Association of "Architectes Diplômés du Gouvernement" have addressed to M. Coquart the following letter:—

"Cher et éminent Confrère  
La mesure qui vient d'être prise à votre égard nous a doublement émus, car elle frappe à la fois l'artiste et le membre de notre Association.  
Sans perdre absolument l'espoir de vous voir terminer votre œuvre, permettre nous, cher maître, de vous adresser nos sincères et profonds regrets, ainsi que l'expression de notre respectueuse sympathie."

Here follow the signatures. The letter expresses the general feeling in the artistic world in regard to this step. As matters now stand, however, M. Louis Bernier, architect (a former holder of the Prix de Rome) has been named to replace M. Coquart at the École des Beaux-Arts, and the continuation of the work at the Cour de Cassation is notified as entrusted to M. Paul Blondel.

While M. Yves Guyot has been, so to speak, sentencing M. Coquart to execution, his colleague of the Ministère de l'Instruction Publique, M. Bourgeois, has been occupied in dealing somewhat severely with the "joyeuxsetés" of the pupils of the Atelier Bonnat at the École des Beaux-Arts. We have before suggested (in referring to the question of the admission of female students to the École), that the manners of the Ateliers were not quite perfect. The youthful mob of students gathered together here affect a licence of behaviour which, to say the least, is hardly in accordance with the standard of manners of the present day. In particular they have adopted in full force the system of "Brimades," so much practised in the French regiments, and against which a special interdiction has been made at the military school of St. Cyr. The word "Brimade," which has probably no equivalent in English,\* signifies a systematic series of vexations to which new comers are subjected, and which too often pass quite beyond the reasonable limits of joking. On this occasion the "Brimade" degenerated into a furious fight in downright earnest, leading to serious injuries. Several pupils have been sent away from the schools as a disciplinary measure; the Atelier Bonnat has been closed, and the seventy-three pupils who were members of it have been deprived of the benefit of State instruction for three months. It is generally considered that the Government have been right in interfering, and that the thing had gone too far to be any longer overlooked.

The affair has been made an occasion, on the part of the Conseil Supérieur de l'École, for examining into the conditions on which students are admitted into the different ateliers. As a matter of fact, every head of an atelier admits whom he will and how he will, without any pre-arranged conditions. The so-called State ateliers are therefore, in actual fact, only private ateliers established in a State building, except that the instructions are gratuitous. This is considered an anomaly, which the Conseil Supérieur intends to put an end to in future by requiring that every pupil should be admitted by the central authority of the École. The ways and means for operating this alteration will be considered shortly.

Other reforms are in the air. The recent discussion of the Beaux-Arts budget has attracted special attention to the present tendencies of the École, and it is probable that there will soon be important modifications in the manner of Government intervention in the artistic education of the French nation. That is at least the conclusion to be derived from certain speeches in the Chamber of Deputies, in the course of which the Ministre de l'Instruction Publique observed that "there ought not either to be a State art or a State taste," and that the business of the State was to go wherever there was real talent, without any question of schools of teaching; a principle the general truth of which will hardly be contested.

\* We believe the word has no equivalent in English; but if our Paris correspondent got hold of some of the private annals, say of an English cavalry regiment, or of some of the reminiscences of Woolwich students, he would probably find that the thing itself is very well understood in England. And our young men, however, it is considered a point of honour never to lose temper over these little amusements.—Ed.



In the last competitions in the *École des Beaux-Arts* the subject given in historical architecture was the reconstruction of an ancient Persian palace; the jury awarded a second medal only, to M. Mars, pupil of M. Lalou.

Since our last letter the competition for the decoration of the *Galerie Lobau* at the *Hôtel de Ville* has been decided. Out of seventy-five competitors the jury selected five who are to submit, in a few months, a portion of their respective designs of the size intended for execution. The five chosen are M. Boureau (painter), M. Espouy (architect), M. Gailhac (painter), M. Moreau Nèret (painter) in collaboration with M. Noël Bouton (architect), and M. Picard (painter) in collaboration with M. Risler (architect). In order to facilitate this second competition, the *Service des Beaux-Arts* has had constructed large models of one cupola, one of which will be put at the disposal of each of the competitors, who will thus find their work much simplified.

To the *Galerie Lobau* competition has just succeeded, at the *Hôtel de Ville*, that which the "Société Française des Habitations à Bon Marché" has opened for studies of lodgings and workmen's cottages of various types to be erected at St. Denis, on an irregular piece of ground near the "Nord" railway line. Among the forty-eight schemes submitted, very few show any remarkable novelty. Most of them are only repetitions of commonplace forms of structure resembling barracks, and where many families are crowded into one block in a manner by no means favourable to healthy conditions. One project only, No. 35, seems to realise any improvements worth speaking of. It includes various types of habitation, with one fairly picturesque style of architecture pervading them; it is well laid out and with an abundant distribution of water. The total effect of this design contrasts agreeably with the monotony of the work of the others. The decision on the competition will be made some time during the present month.

Public works have been mostly stopped the last few days by the exceptionally cold weather. This has also necessitated some delay in the work of exhuming the ancient arena in the Rue Monge, which M. Juste Lisch had been carrying out actively. All the side of the arena facing Rue de Navarre has now been uncovered and restored, and at the first fine weather M. Alphonse's gardeners will appear on the scene and transform this curious vestige of ancient Lutetia into an ornamental square. The municipal administration proposes to provide a small museum on the site, in which will be placed various antiquities discovered in or near the site, including fragments of sculpture, coins, jewels, pottery, and even some skeletons discovered in Gallo-Roman sepulchres.

While preserving the remains of ancient sculpture, the authorities have also been turning their attention to the preservation of some modern sepulchral monuments. The cemeteries of Paris are full of monuments to illustrious personages, many of which are works of art of great interest, which have suffered greatly from time and from want of proper care. M. Havard, *Inspecteur des Beaux-Arts*, has been struck with the melancholy condition of many of these monuments, and has expressed the opinion that it is the duty of the State to take under its charge the repair and conservation of these monuments. He suggests that the Commission des Monuments Historiques should classify them, and that an annual sum of 10,000 francs should be placed to the credit of the *Ministère de l'Instruction Publique* to be employed in their preservation and repair. The idea has received much support in artistic circles, and it seems not improbable that it may be seriously taken up.

There is much talk about again enlarging the Luxembourg Museum, which is still too small for its purpose. This enlargement would necessitate the construction of a new gallery which would be projected from the central block of the building and abut on the grille of the Rue Vaugirard. In this way the Museum would form three blocks surrounding an interior court which would permit of the exhibition of a certain number of works of sculpture. There is also talk (for the twentieth time at least) of the completion of the Boulevard Haussmann, and the Municipal Council will probably be presented presently with financial proposals in regard to this often-discussed and long-deferred project.

We have to record the death, a few days

since, of M. John Lewis Brown, a painter whose talents were well-known in London as well as in Paris. He was born at Bordeaux in 1829. He first became known for his studies of horses and dogs, for military subjects and sporting scenes, and latterly had given himself more to the latter class of subjects than to any other. He went through a steady course of study of the horse at the "École des Haras" at Pin (Calvados), and subsequently established himself at Bordeaux in 1859, but his success in various exhibitions led him to come to Paris. His works are very numerous, and distinguished by a fine sense of colour and great power of drawing. Scarcely any exhibition in Paris of late years was without examples of his work, whether in water-colours, pastels, or etchings, besides his numerous oil paintings. He obtained medals in 1865, 1866, and 1867; and the Cross of the Legion of Honour in 1870. He exhibited four works at the Great Exhibition of 1889, and a small collection of his pictures formed a striking group in the "Salon Meissonier" of this year. He died after a long and painful illness, much regretted by all who knew him.

We have also to record the death of M. Léon Rivière, expert of the Tribunal de la Seine, and architect of the *Crédit Foncier de France*. He died at Paris at the age of seventy-six.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The third ordinary general meeting of this Institute for the present session was held on Monday evening at No. 9, Conduit-street, Regent-street, Mr. Alfred Waterhouse, R.A., the President, in the chair.

#### The Recent Examinations.

The Secretary announced that the following gentlemen had passed the Preliminary Examination, and had thereby become Probationers of the Institute:—

Messrs.: Frederick John Almond, Manchester; Henry Victor Ashley, Woodside Park, N.; Raymond Turner Barker, Southgate; Ralph Waldo Beddingfield, Leicester; Thomas Percy Bennett, Manchester; Percival Cherry Blow, St. Albans; Cecil Claude Brewer, Weyford; Albert Thomas Butler, Dudley; George Edward Clay, Warrington; Frederic Wykeham Chancellor, Finsbury-circus; Henry James Cooper, Leicester; John Marie Crean, Dublin; Harry Bulkeley Creswell, Denbigh-place, W.C.; Edward Cruikshank, Bloomsbury-square; Ernest Reuben Octon Davis, Leicester; Thomas Daston-Brooks, South Elmstall, near Doncaster; Charles Frank Devitt, Finsbury-circus; Charles Henry Dorman, Northampton; John William Fair, Manchester; Thomas Speirs Fraser, Glasgow; Richard Frank Freeman, Bolton-le-Moors; Thomas Wallis Gordon, Nottingham; George Gregory, jun., Stonehaven, N.B.; Herbert Wilcox Hare, Manchester; William Joseph Jones Hill, Derby; David Horn, Hampstead; Franklin Kaye Kending, Blackheath; Harold Clapham Lawder, Tonbridge Wells; William Langley, Leicester; Herbert Henry Law, Northampton; John Bowmer Mason, Derby; Percy Matthews, Crouch-hill; William Allen Maylett, Worcester; Thomas Clemshaw Mayor, Manchester; Arthur Ernest McLewann, Handsworth; William Daniel McLennan, Paisley; Percy William Meredith, Bideford; Thomas Anderson Moodie, Glasgow; Lionel Forster Morris, Kentish Town; Wilfrid Rowland Mosley, Derby; Charles Frederick Newcombe, Newcastle-on-Tyne; Robert Orr, Scarborough; George William Phillips, Peterborough; Francis John Potter, Hampstead; Ambrose MacDonald Poynter, Albert Gate; Orlando Edmund Thomas Prescott, Southport; Roland Rich, Newcastle-on-Tyne; Herbert Cyril Sinnott, Westbury-on-Trym; Thomas Arthur Sladdin, Haverstock-hill; John Elliott Snales, King's Langley; Osgood Smith, Crouch-hill; John Charles Southcombe, Arlington, near Barnstable; Arthur John Steadman, Farnham, Surrey; Isaac Taylor, Manchester; Athol Sabben Tukey, Chiswick; Bernard Hugh Webb, Hampstead; and Emil Fitzwalter Wren, Powis-square, W.

The following gentlemen were reported as having passed the Examination for the Association held last week, viz.:—

Bartlett, Arthur Edward, Reading.  
Blyth-road, W.  
Conner, William Tait, Glasgow.  
Hutchinson, Christopher Bernard, Kensington.  
Flower, Arthur Symth, Jackson, Arthur Blomfield, Mecklenburgh-square.  
Stanhope-gardens.  
Gamble, Henry Gilbert, Highgate.  
Jefferson, John England, Stroud Green.  
Glazier, Richard, Manchester.  
Jones, George Sydney, Sydney.  
Greenaway, Francis Mitchell-Withers, John Hugh, Egin-orecent.

Brightmore, jun., Sheffield.  
Musto, Frederick, Leeds.  
Peggs, Hallam Carter, Nottingham.  
Pite, William Alfred, Bloomsbury-square.  
Porter, Horatio, M.A., Russell-square.  
Pratt, Robert Bailie, Brocknock-road.  
Rogers, Henry Cornwallis, Gerald-road, S.W.  
Smith, Walter Henry, Maidstone.  
Strange, Charles Hilbert, Stoke Newington.  
Sutcliffe, George Lister, Heptostall, via Manchester.  
Wigglesworth, Herbert Hardy, Aberdeen.  
Williams, Frederick Ernest, Onslow-gardens.  
Wonnacott, Ernest Wm., Malpas, Bishop's-road, W.  
Young, Vivian Edward, 53, Ennismore-gardens, S.W.

The Asphit Prize (it was announced) has been awarded to Mr. F. William Bedford, formerly of Leeds, aged twenty-two years.

#### The Royal Gold Medal, 1891.

The Chairman announced that, on February 2, the name of the person who is considered by the Council the fitting recipient of the Royal Gold Medal for 1891 will be announced. Any member of the Institute desirous of sending in any name is requested to do so before January 1.

#### The Architectural Association.

The President then said he had learned from sources which he need not particularise that the references he made to the work of the Architectural Association in his presidential address at the opening meeting of the session had left an unfavourable impression on the minds of some who were deeply interested in the welfare of both the senior and the junior bodies of their profession. His words, of which the chief complaint was made, were:—

"The educational work done by the Association does not appear from the statistics with which I am furnished to afford any great material assistance to the Institute."

and he had been asked to show from the returns of one whole year what was the proportion of members of the Association who passed the examinations in architecture, which he had great pleasure in doing. During the current year, 1890, two examinations to qualify for candidature as Associates had been held in London, at which 51 candidates had passed. They had come up obviously under the old arrangement, none of them having passed either a preliminary or an intermediate examination, and there had been no candidates for this qualifying examination at any non-metropolitan centre. Of the 51 who passed in London 32, he understood, and it gave him great pleasure to have to say so,—were members of the Association, and most of the 32 were London men, but he thought they were justified in asking whether they owed their successes to attendance in the classes of the Association, for the President of the Association, in his address of 1889, asked "How it is that when a member wishes to go up for the Institute examinations we find that, instead of availing himself of the opportunities afforded him in the Association, he goes to a private institution to obtain the instruction he requires?" And again, in his address of this year, he said he did not think "a student who confined himself to attending classes at the Association would stand much chance of passing the Institute examinations." Such an opinion expressed by a gentleman who must be thoroughly conversant with the facts of this important subject, and the statistics with which he (the President) was furnished by the Secretary of the Institute, seemed to him to justify the doubts expressed in his address. Undoubtedly, while there was only one examination the Institute obtained a large proportion of its recruits from among the members of the Association, but the establishment of the progressive examinations already appeared to him to have effected a change in this respect, as he then stated, and as he would now show from details prepared for him of the three preliminary examinations already held in London and other parts of the United Kingdom. Up to the present 196 probationers had been registered, of whom 44 or 46 were now members of the Association, but at the time of their application, as was natural, only about 26 out of the 196 were members of the Association, although 75 out of the 196 came from London and its neighbourhood. Of the 32 gentlemen from London and neighbourhood who passed in November, 1889, only 10 were members of the Association; of the 23 who passed in March last, only 10 were members; and of the 20 who passed this November,



only 6 were members. Further, not one of the 10 probationers registered in 1889, who were also members of the Association, helped to compose the 8 who were admitted to the first intermediate examination held in November, 1890. On the other hand, in the space of twelve months, some 20 gentlemen, after admission to the Probationers' examination, had joined the ranks of the Association; and he sincerely trusted that the majority of their 46 Probationers who belonged to the Association would make a good show at the intermediate examinations to be held in November of next year and in March, 1892. It might be interesting to add that, of the 196 probationers, 89 were declared exempt from examination, 63 were examined in London, 3 in Dublin, 3 in Glasgow, 12 in Bristol, and 26 in Manchester, and he thought it was impossible to estimate too highly the debt of gratitude owing to most of their allied societies for their disinterested labours on this and previous occasions. But, to return to the Association, though he felt bound to give these statistics in answer to certain criticisms on his address, he wished it to be distinctly understood that he did not in his remarks wish to imply anything prejudicial to the Association. Though he never had the advantage of being a student within its ranks, he had been a member for many years. He had always upheld its advantages, and if he spoke plainly the other night it was out of real interest in its welfare, and not out of any antagonistic feeling whatever. He wished the Association to seriously consider its position with regard to the Institute, and thought he could best express his wish by calling attention to what he believed to be the facts of the case.

Mr. H. C. Brodie suggested that a letter by Mr. Owen Fleming, containing statistics regarding examinations published that day in *A. A. Notes* should be republished in the *Journal* of the Institute.

The President replied that if possible the editors of the *Journal* would reprint the letter.

#### Sassanian Architecture.

Mr. R. Phené Spiers then read a paper on "Sassanian Architecture," of which the following is an abstract:—

Mr. Spiers commenced by stating that the recent completion of two works,—"L'Art Antique de la Perse," by M. Dieulafoy, and the "Histoire de l'Art dans l'Antiquité," vol. v, by MM. Perrot and Chippiez,—both of which added to the scanty knowledge we possessed of the architecture of the Sassanian Dynasty (A.D. 226-636), had suggested this subject as one likely to interest the Institute; for though that dynasty had endured but little more than 400 years, the architects and artists of the period had developed a characteristically marked style from a constructional point of view. But the style had, in Mr. Spiers's opinion, other claims to consideration, as it seemed to form a connecting link between Assyrian and Babylonian architecture on the one hand, and Byzantine work on the other,—of retrospective value, if the vaults of Al Hadhr, Serbistan, and Firouzabad represented the traditional method of such coverings handed down from Assyrian times, and of prospective value in regard to Byzantine work, provided that the dates given to Serbistan (about A.D. 350), and Firouzabad (about A.D. 450), were correct. The earliest building classed as Sassanian by Fergusson was the Palace of Hatra, now called Al Hadhr, respecting which little was known beyond the information communicated to the Institute in 1846 by Mr. (now Sir) A. H. Layard. There were further accounts of the ruins given by the late Dr. Ross, the surgeon of the British Residency at Baghdad, in the 9th volume of the *Journal* of the Royal Geographical Society, and by Mr. Ainsworth, in the 11th volume of the same *Journal*, though for a general description of the city, members were referred to the MS. Essay by Sir H. Layard in the Institute Library. Two of the great halls of Al Hadhr measured about 95 ft. by 42 ft. or 46 ft., and the third 60 ft. by 65 ft., and their vaults which had fallen in were said to be semicircular, though the Sassanian vaults were usually elliptical. Their doorways were, however, invariably circular-headed. Certain of the voussoirs of the arches were enriched with sculptured heads, and the entrance doorways to the smaller halls had heads with curly bagwigs, such as were found on Parthian coins, on every voussoir. As regarded the form of the vaults, the elliptical, or three-centred curve, was that used at Serbistan and Firouzabad, and as

a matter of fact that form of arch in brick construction was one of the earliest known, for the vaulted granaries behind the Ramession of Thebes in Egypt were of the same elliptical form as those found in Persia.

The possibility that the palace owed its erection to Parthian rather than Sassanian architects, had been suggested in Professor Rawlinson's "Sixth Great Oriental Monarchy," for when the city was besieged by Trajan in A.D. 116, it contained a Temple of the Sun, which was probably the square building at the back of the palace, containing a frieze above the doorway, ornamented with the head of the Sun-God, with crescents to represent the moon on either side, and, among other emblems, winged griffins. These last were precisely similar to a griffin found at Warka (the ancient Erech), in the south of Mesopotamia, 250 miles south of Al Hadhr, and described in the work on Chaldaea by Loftus, who therein gave drawings of various objects discovered at Warka, of the same type as that shown in Sir H. Layard's sketches, viz.,—Syrio-Greek, a style which distinguished all Eastern work of that period. The second building mentioned by Fergusson was the so-called Palace of Tigrales, now the Great Mosque at Diabekr, which seemed to have been built up of materials taken from some earlier building, while the ornament, which resembled that found by Loftus at Warka, seemed to be Parthian in style. The next example quoted by Fergusson, the Palace of Serbistan, seemed to Mr. Spiers to be the first genuine Sassanian building, and in design and construction it appeared to be the outcome of many experiments made in earlier buildings no longer existing, or not yet discovered. The halls, which were about 26 ft. wide, were covered with elliptical barrel vaults, traces of which were to be seen on an end wall.

Next, there was the Palace of Firouzabad (A.D. 450), which had a frontage of about 170 ft., and a depth of about 320 ft. The entrance consisted of a hall 90 ft. in depth, nearly 40 ft. wide, covered with an elliptical barrel vault. Other halls were on either side, and beyond were three halls side by side, each vaulted with a dome on pendentives, which consisted of a series of concentric arches advancing one over the other and displaying increased scientific knowledge, whereby the Sassanian architect did away with centring altogether, each superimposed ring being carried back on the top of such ring beneath, and resting on it. Another palace, distant about thirty miles from Baghdad, that of Ctesiphon, on the Tigris (about A.D. 500), which was known to have been built by Chosroes I., formed a rectangular block 312 ft. by 170 ft., and about 110 ft. high. In the centre of the front a magnificent portal,\* which rose to the full height of the building, gave access to a hall, 163 ft. deep by 83 ft. wide, covered with an elliptical barrel-vault, 95 ft. from the ground to the crown of the vault, and 67 ft. from the ground to the springing of the vault. The bricks or tiles with which it was built were laid flatwise, as in the granaries at Thebes. The remains of two other palaces had been found in Persia, one at Immazade which consisted of a dome on arches, and a second, called the Tag-Eiran, recently discovered by M. Dieulafoy, the hall of which showed a considerable advance in construction, as it was lighted by clearstory windows between the barrel-vaults. These vaults were composed virtually of a series of transverse arches, the interspaces being vaulted across in a most scientific manner. Two other Sassanian buildings remained to be mentioned, which were remarkable for their decoration rather than their construction, namely, the Palace at Mashita, and the Hall at Rabbath-Ammon, both in Moab. They were supposed to have been erected under Chosroes II. by Syrio-Greek artists, and they were enriched with ornament derived from Hebrew monuments, interspersed with Persian figures and Sassanian decorative details.

Mr. W. Simpson, R.I., Hon. Associate, expressed great satisfaction at Mr. Spiers's paper, which brought together the main points of the Old Sassanian Architecture, and had exhausted almost all that was known of the subject. Architectural students were tending more east-

ward in their researches, so that men, who had the time and means, were wanted to explore for architectural remains, and he felt sure, if the teachers at the Universities could be influenced to so direct the thoughts of young men, that valuable results would follow. Major the Hon. M. G. Talbot, R.E., of the Survey Dept., attached to the Afghan Boundary Commission, had made plans and sections of some rock-cut caves found by him at a place called Haibak, not far from the ancient Balkh. Among them were a number of domes, which, although excavated were copies of structural domes, and similar in shape to the Sassanian ones. The sectional outline of one tall oval dome was almost the same as that of the great arch at Ctesiphon. These caves showed that the Sassanian style existed over a much wider area than the Mesopotamian Valley. Poetry, architecture, art, and science generally had once been in the most flourishing condition in Khorassan and the countries round it, and it was quite possible that the art of the Sassanians came from that region. In Persia, where wood was scarce, vaulted roofs and domes were the rule. Central Asia must have been, he considered, in a similar condition, and, having seen how easily simple villagers constructed vaults and domes without centres, it appeared to him that in all probability such roofs had been used in those regions from very early times. The Euphrates valley had also been rather destitute of wood, which he thought accounted for the vaulted roof being used in that region; and it might be assumed that from Mesopotamia to the ancient Balkh and Samarkand the vault and dome existed from the earliest period of civilisation. Professor Baldwin Brown, in Vol. V. of the "Transactions," gave a reference, showing that ancient Alexandria had been built on vaults. The vault seemed to have existed far more widely than had been previously realised; it had been a sub-structure only wanting the necessity, or occasion, to bring it above ground as a superstructure. In the domes and vaults now built in Persia, the bricks were placed in a sloping position, as described by Mr. Spiers, so as to rest partly on one another, which no doubt largely helped to do without centres. He supposed lightness was the object of the use of pendentives; the Persians in building a mud wall made square hollow bricks, to which they gave the term "Sanduk," which meant a box, and these they placed on the top courses for lightness. Mr. Simpson concluded by proposing a vote of thanks to Mr. Spiers for his paper.

Mr. Alma Tadema, R.A., in seconding the motion, said he was sorry he attended the meetings of the Institute so seldom, because when he did so he always learnt a great deal. As far as the paper was concerned, he could only repeat what Mr. Simpson had said, that it was learnedly wrought out. It had caused him to think particularly of the old question of the arch and the dome with reference to which he was rapped over the knuckles many years ago, because he contradicted the statement that Arabic architecture had its dome from the Byzantine, which he did not believe. With reference to the Palace of Tigrales, he rather believed it to be Armenian.

The President said the members were very much indebted to Mr. Spiers, who had taken so much pains to illustrate his subject and to bring it before them in the way he had done. There seemed to be very little left for them to exercise their ingenuity upon, but to him the illustrations contained a most striking feature in the arch of Ctesiphon, which he thought was nearly 100 ft. high, and the curious wall ornamentation on either side of it. They would all remember the bit of ornamentation from Mashita which was so lovely and so exquisitely rich.

The resolution was cordially adopted, and the proceedings then terminated.

ABERDEEN STREET IMPROVEMENTS. — The Improvements Committee of Aberdeen Town Council agreed on the 27th ult. to the extension of Huntly-street to Chapel-street, the cost of the scheme being £3,000.

PUBLIC IMPROVEMENTS AT HANLEY. — On the 12th ult. Colonel John Ord Hasted, R.E., Inspector of the Local Government Board, held an inquiry at the Hanley Town-hall into an application by the Town Council for power to borrow £6,500. for market alterations and street improvements, £3,750. for the completion of the Town-hall, and £1,500. for the adaptation of the Potteries Mechanics' Institution to the purposes of a museum and science school. There was no opposition offered to either of the applications.

\* See sketch and description of this great arch, in a letter by Mr. Phené Spiers printed in the *Builder* for March 24, 1889, p. 211.





*Silver-Gilt and Mother-of-Pearl Spoon, with Crystal Handle.*



*Pyx belonging to Stonyhurst College.*



*Snuffers (Renaissance).*



*Silver Table presented by the City of London to Charles II. (from Windsor Castle).*

SPECIMENS OF ORNAMENTAL WORK.

#### SOME SPECIMENS OF ORNAMENTAL WORK.

THESE illustrations are from a collection made by the late Sir Digby Wyatt, to which we have before referred, for an intended publication. The Pyx from Stonyhurst is the most characteristic piece of design; the treatment of the supports round the glass receptacle is curious and not inelegant. The Renaissance table from Windsor Castle is a rich specimen of the work of its epoch, very satisfactory on general lines, but showing that constant defect in Renaissance furniture, the want of proper joining of the constructive parts of the design; the scroll legs are merely (to all appearance) butted against the lower part of the central stalk, instead of appearing to be constructively connected with it.

We do not know the "provenance" of the other two objects. The snuffers suggests in the handles the kind of treatment which is dear to the makers of ceremonial keys for the opening of buildings in the present day, viz., the use of a miniature Classic capital from which a stem seems to spring. The design of this portion is however more workmanlike than we generally find in the ceremonial key, as the parts where strength is required really appear strong. The fault of the design is in the second heads or masques introduced on the handles below the torsos. They have no decorative business there, and just spoil what would otherwise be a good design of its kind.

The spoon is so curious as to be worth illustration, but certainly not imitation. There is something clever certainly in the way in which the dragon's tail is carved on in a spiral twist round the handle; but the three component parts have no relation to each other in idea, and the connexion of the handle with the bowl, as if held in the dragon's mouth, introduces an appearance of weakness just where that of strength ought to be most emphasised.

#### ARTS AND ARTISTS IN FORMER TIMES AND TO-DAY.\*

UNTIL a comparatively recent period a monument of architecture,—or, in more prosaic words, a national or public building,—contained within itself, as parts of itself, all the great arts, technic, æsthetic, and phonetic; and these are three words which, in spite of Examination Boards, the majority of us have often difficulty in clearly and tersely defining. Let me therefore adopt the definitions of them given by the late James Fergusson. He tells us that the *technic arts* are those resulting from one's muscular action or power, whereby the materials composing a great building are wrought into constructive forms; that the *æsthetic arts* are due to those developments of sense by which one is enabled to arrange and distribute the parts of a great building for given purposes, culminating in what is called "design"; that the *phonetic arts* emanate from one's power of representation, their many developments culminating in "sculpture" and "painting." The two first suffice to make a building useful and beautiful; the phonetic arts endow it with expression, whereby it becomes a record of the life and manners, the thoughts and aspirations, of the people who erected it,—in short, an historical monument. To put the matter in another way: a great building may be described as perfect,—first, on *technic* principles, because of the proper use, application, and distribution of materials in its construction; secondly, on *æsthetic* principles of design, because of its convenient and harmonious arrangement, combined with its ornamental construction; thirdly, for its *phonetic* adjuncts, like sculpture and paint-

ing, employed as voices to tell its story,—to explain the purposes for which it is erected.

These arts were common to the artists of every nation which achieved excellence prior to the invention of Printing, and the consequent diffusion of general knowledge, between the years 1450 and 1550, wherein the boundary line between the old and the new methods of artistic practice, according to Fergusson, must be sought.

#### The Ancient Migrations.

The fame of Alexander of Macedon, the master of Greece some 2200 years ago, still lives in the names of cities in eastern Europe, in Egypt, all over Asia Minor, and in north-western India. His armies are said to have started from Macedonia, over the Balkans to the Danube, and then to have returned southwards to the Hellespont which they crossed in order to make the conquest of Asia. That the armies of Alexander the Great contained a vast number of Greeks may be assumed to be correct. The Greeks for 200 years before his time, and for at least 800 years afterwards, were the artists of the world, or rather that part of it known as the Roman Empire; and their migratory character is proved in a host of instances. That they reached as far East as the Punjab is attested by the discovery in recent years of Greek sculptures in that part of India; and that Indian tradition preserved the habit of systematically moving large bodies of men is an historical fact. There is an authentic account, left by an English ambassador sent by James I. to negotiate a commercial treaty with the Emperor of Hindustan, of what was then called "a movable court," which moved rapidly from place to place. Sir Thomas Roe, the ambassador referred to, saw one "set up and finished in four hours, though it was done with great order and exactness." The Emperor was said to "go a progress," which resembled the removal of a nation. At the several halting places, his pavilion was placed in the centre

\* A paper read before the Architectural Association on Friday, the 28th ult., by Mr. William H. White, Secretary of the Royal Institute of British Architects, as elsewhere mentioned.



of the encampment, and isolated from all around. Every one knew what ground to take, and how far from the Emperor he must pitch his tent, or raise some kind of shelter; every one knew where to go for the supply of his wants—for special streets, so to speak, were devoted to different tradesmen, artificers, and others. Elephants, horses, oxen, were arranged in specified places; they were always ready to start for some other camping place. Some such systematic method of travelling as this must have prevailed before the time of the Romans; and it is believed that 400 or 500 years before Christ great cities flourished in Asia Minor and northern Africa in which extraordinary excellence was attained in the construction of buildings with light and perishable materials, under the guidance of Greek artists. The dome and even the arch were then used. The Roman, when, so to speak, he came upon the scene, found the arts of which he afterwards made so extensive a use in working order.

Another hero, of whom more information is extant than has been found of Alexander the Great, was Julius Caesar. His camp was a square, entrenched on its four sides, laid out in streets within, and having quarters specifically arranged for the several divisions of the army. In the camp was a market-place, and there were special quarters for the artificers. Caesar had to build bridges over the Rhine and other rivers, and before he crossed to this country he had to build a fleet. His armies were something more than mere aggregations of fighting-men. They were communities of soldiers and craftsmen who at times were compelled to settle down in one place, to remain there for months, even years; and the arts of peace were probably pursued by them with as much earnestness as those of war.

The masters and chief artists employed by the Romans in the design and superintendence of their buildings were Greeks. Their various corporations of workmen were highly trained; and, as may be seen at the present day in the quarries once worked by Roman enterprise, the organisation for the supply of materials was of a character beyond the conception of modern practice. Even when the so-called Barbarians were masters of Rome, the Emperor Theodoric instructed his architects in a proclamation—quoted, a short time ago, by one of the Presidents of the Architectural Association—which serves to show in what esteem the design and erection of monumental edifices was then held. From Theodoric's time until the eleventh century the thick veil drawn over history has never been lifted. The annals of the arts during the first half of that period are absolutely void, and during the remaining half extremely meagre. One thing, however, is certain. The great cities founded by the Romans in all parts of their Empire remained, to afford a shelter or a quarry to generation after generation of inhabitants.

#### The Monastic System.

That the influence of Rome over the world was ever entirely lost is more than doubtful; its moral influence exists at the present day over an enormous portion of the globe. The monastic system, practised more than 1,800 years ago, flourishes, it may be said, to-day. Gibbon, in perhaps the most fascinating chapter of his "Decline and Fall of the Roman Empire," describes the early communities of monks. He says:—

"The philosophic eye of Piny had surveyed with astonishment a solitary people who dwelt among the palm trees near the Dead Sea; who subsisted without money, who were propagated without women; and who derived from the disgust and repentance of mankind a perpetual supply of voluntary associates.

Colonies of monks flourished at Thebes in Egypt, and in the cities of the Nile, during the third and fourth centuries; and about A.D. 340, the practice of the monastic life was introduced and taught in Rome. A little later, monasteries were established in Gaul; and at last every city of the Empire was inhabited by increasing multitudes of monks. Gibbon shows how the monastic life, by the aid of which the arts came down from Roman times to our own, was propagated over the world. He says that "the life of Hilarion," who was born at the close of the third century,

"Displays the facility with which an indigent hermit of Palestine might traverse Egypt, embark for Sicily, escape to Epirus, and finally settle in the island of Cyprus. . . . The pilgrims who visited Jerusalem eagerly copied, in the most distant climates of the earth, the faithful model of the monastic life. . . . The monastery

of Banchor, in Flintshire, dispersed a numerous colony among the barbarians of Ireland; and Iona, one of the Hebrides, which was planted by the Irish monks, diffused over the northern regions a doubtful ray of science and superstition."

So says Gibbon; and there can be no doubt that when the Roman power came to an end, and even during its decline, these aggregations of monks exercised, in their respective localities, both physical and moral sway over the country around.

What a camp was to an ancient Roman army, with its market-place, its streets of artificers' workshops, its functionaries of every description, the original monastery was to the army of the ancient Church. Like the movable "court" or camp which Sir Thomas Roe saw in India, three centuries ago, the Emperor's pavilion, that is to say, the church, was placed in the centre, and the several dependencies had their respective positions around. The villa or town which the Romans had built often became a home for the monks; and there is abundant evidence of their having converted the ancient temples and other buildings into churches and monastic dwellings. The Roman villa was in fact the model of the monastery or abbey of the ninth century. One of these great abbeys, founded some two centuries before the time of William the Conqueror, was situated near Micon. Its name and fame will long endure, for in the Middle Ages the Abbey of Cluny was the common school or university of arts, whence issued the men who directed the construction of the great abbeys, cathedrals, and churches of France and England, of a large part of Germany and Spain, and of northern Italy. If this fact be once grasped—that in the Middle Ages there flourished a central institution in which a common language, the low Latin, was spoken and taught—the Medieval sequence of events wherein, under the tutelage of religion, the great arts played a principal part, becomes perfectly clear and comprehensible. From the Abbey of Cluny went forth the masters and chief artists of the eleventh, twelfth, and thirteenth centuries; and throughout western Europe similar branch establishments, founded on the model of Cluny, existed. Not only all the learning, but all that contributed to education, was confined within the religious houses, and could be learnt only from the monks. How was it that they worked? How came it that the face of western Europe, in the course of five centuries, was covered with buildings which have been the puzzle and admiration of Englishmen during the last hundred years?

#### Western Europe in the Middle Ages.

Architects who have seen a village or a small town situated on the site of an ancient building or within its ruins; those who have seen the walls of peasants' cottages composed of moulded stone or squared blocks of granite, can realise the appearance of a city in Italy or southern France about the ninth and tenth centuries. It was constructed very largely of old materials placed one over the other, not without some thought of external effect. From Rome downwards all the cities of the Empire went through this experience. Given the plan of a church, with instructions to put into the building so many windows, doors, and arches, so many columns, and having raised the walls to a certain height to cover it with a vault, local artists obtained for the various purposes indicated ready-made materials from neighbouring old and disused buildings. The theatres, triumphal arches, baths, the tombs and other monuments of Roman magnificence, were dismantled, and the materials of which they were composed used for the earlier churches. In the older cities of Provence and other parts of southern France, huge blocks of stone, perfectly worked, lofty columns of vast dimensions, elegant mouldings, and capitals of refined execution, are to be seen in the more primitive churches; and they astonish the beholder by the grandeur of their appearance in the midst of a semi-barbarous medley of construction. Indeed the vastness which distinguishes the French cathedrals, as compared with the English cathedrals, is mainly due to the fact that the legacy left to France by the Romans was far larger than that which they left to us. When, in the middle of the thirteenth century, the style evolved out of the constructive methods employed by or forced upon the earlier Medieval builders attained perfection, an expert, with the training which a modern archaeologist undergoes, might have easily traced the origin of every portion of a cathedral from

some ancient building in the neighbourhood, or within a certain area of territory.

The principles of construction adopted in the ecclesiastical edifices of the Middle Ages are similar in France and England, and identical from period to period in buildings which are a thousand miles distant from each other, and which were erected almost at the same time. If one takes the early cathedrals, it will be found that, whether in France or England, or in other parts of western Europe, they are all of the same general model, and must consequently have been erected from a common plan. This plan was one accepted by the Church, and it was worked out at a common centre, probably at Cluny. Moreover, when at subsequent periods, prior to the fourteenth century,\* most, if not all, the cathedrals of western Europe were enlarged and beautified, the form of arrangement, the principal constructive features, even the ornaments, were similar, as many buildings, situated at a great distance from each other, suffice to testify. In the Middle Ages a central institution, through its innumerable branches, guided the masters and artists, just as, at the present time, a Government department in India issues the plan and elevation of Barracks to be erected in different parts of the Indian Empire, with instructions to different local superintendents to use the materials at their immediate disposal, and to employ the workmen of their respective localities in the execution of the work.

One who would realise what the face of western Europe must have been like in the Middle Ages should travel in those parts of India but slightly inhabited by Europeans, where there are still many walled cities and fortified hamlets; or in China, which still abounds in Buddhist monasteries. Let us imagine a vast plain, with here and there a jungle or forest marsh or morass, and as far as the eye can reach no trace of a substantial dwelling. The road is a jagged series of tracks, over which at distant intervals a horseman may trot or gallop, a palanquin or a litter with a lady and her child may be borne by runners and accompanied by horsemen, friars—may be walking, merchants, pedlars with goods for sale, may be seen, each with an escort proportionate to his rank. Travellers in such localities accept the risks of robbery and murder; and on the great highways of Europe in Medieval days men had to protect themselves and each other as best they could. Imagine, therefore, the delight with which, then, a traveller saw in the distance a tower or a spire—the encouragement it afforded to him, the influence upon his senses caused by the distant sound of a peal of bells! Within that inclosure, the existence of which afar off was thus proclaimed, he sought and found a lodging for the night, meat and drink after the labours of the day; and, if he were poor, alms with which to continue his journey. The stranger within the gates of such a building, or group of buildings, enjoyed not only hospitality and rest for his body, but also intellectual recreation. The sculptures, both on the outside and inside of the various edifices composing an abbey or a monastery, formed an exhibition which he could perfectly understand. Paintings on the walls and windows, on the roofs and floors, were all illustrations of the sole and universal story of Christendom, told in a diversity of ways—illustrations that, in times when the great mass of both gentile and simple could neither read nor write, were graphic renderings of a common living language, with which the teaching and preaching of the period made even the humblest familiar.

Whatever opinions may be now entertained respecting the aims or character of the Roman Church, it is certain that without its fostering care during the Middle Ages the moderns would have known very little of the ancient civilisation. The pagan authors were diligently studied within the cloister, and copied and recopied by monastic scribes, who thus filled the libraries pertaining to the several abbeys with MSS., the publication of which, by the aid of rude printing-presses, assisted the great intellectual movement of the fifteenth century in Italy, and of the sixteenth in France and England.

\* Macaulay shows that early in the thirteenth century "commences the history of the English nation," and that one hundred years later "the amalgamation of the races was all but complete." ("Hist. of England," i. ch. 1.) It was not until the fourteenth century that architecture in England became definitely Anglicised.—W. H. W.



*The Fifteenth and Sixteenth Centuries.*

The stir amongst the artists of Italy in the fifteenth century, which has furnished the text of numerous books on the Renaissance, much more resembled, I humbly think, development or renovation than revival. The Italians never entirely lost the practice of the arts between the time of Diocletian, and his palace at Spalato, and the time of Bramante, who flourished nearly 400 years ago. Serlio, who inherited the designs and other papers of one of Bramante's pupils, published, in the middle of the sixteenth century, a work which has served as the model for many similar works in all the western countries of Europe. Palladio about the same period was studying Vitruvius and Alberti, and he made plans of all the great public baths of the ancients which he could find, and which were in fair preservation in his day. All the great works of architecture executed during the fifteenth century in Italy were adorned with paintings and sculptures by the hands of the best painters and sculptors of the period; and the numerous pupils of these masters formed schools whose works have been ever since the admiration of the world.

The eminence of the Italian masters, and the fame of the great buildings which abounded in Italy, caused many Frenchmen and Englishmen of distinction, and many travellers of all countries, to visit the Italian cities, whence they sent home tales of the wealth and beauty of the materials which composed the principal palaces and churches. Italian architects and sculptors returned the visit, and some were induced to stay in France. Vignola practised and died there, and his work on architecture has always been to the French what Palladio's work was to the English. The literature studied in Europe during the fifteenth and sixteenth centuries was classical, and the language in which scholars conveyed their thoughts to the world, was Latin. During the reigns of Mary and Elizabeth young ladies of distinction read and wrote Latin, for it was not until many years afterwards that the classical works which the monks had preserved were "Englished out of Latin." The architecture of the time was illustrated—that is to say, the phonetic arts which help to compose a great work of architecture were made to tell the classical story of gods and goddesses, satyrs and nymphs, fates and graces, of pagan creation; and this story was consonant with the general current of conversation and the feeling or affectation of the age. Vast numbers of Italians and Spaniards flocked to England in Queen Mary's time, and the chief poems and romances were translations from the Italian. Inigo Jones, whose Christian name possesses an Italian flavour, made several visits to Italy. Many of the tombs with which the churches and cathedrals, especially in this country, were then filled were executed by Italian workmen. The deep interest taken in the arts during the sixteenth and seventeenth centuries by the ruling class of France, partly, no doubt, from motives of ostentation,—is shown in the books of the time, and the dedications they contain to great personages. The country palaces and châteaux of the nobility then designed and erected were adorned with sculptures and paintings, and surrounded with gardens, fountains, and waterfalls. The vast town-houses which they possessed were equally spacious, with courtyards in front and gardens behind. Absolute harmony of design was maintained both in the exteriors and the interiors of these buildings; and for more than a hundred years the developments of the style which mark the epoch of Louis XIV. and his two successors were pre-eminent throughout Europe.

*Three Epochs.*

Three distinct epochs of intellectual activity in the great arts can be defined, especially in England. Roundly stated, they occurred in the years 1250, 1550, and 1850, thus leaving a lapse of three hundred years between each. During the first epoch the artists drew their inspirations from solid remains of great edifices which had survived the fall of Roman power and the subsequent struggles of the various peoples that composed the Roman Empire. A child's game of house-building with small cubes of wood, played by real workmen with blocks of stone torn from existing buildings, afforded an insight into the process by which the forms and details of the earliest abbeys and cathedrals were evolved. This process, or these processes, were afterwards regulated or systematised, and then directed within certain grooves by a great

central institution, which in its turn acknowledged the supremacy of a universal power stationed in the ancient capital of Rome. During the second epoch artistic inspiration was aroused partly by the study of ancient and Medieval MSS., which had been previously restricted to the use of the monks, but which were at length open to all who could read. The MSS. were copies principally of the works of Roman writers, some of them transcribed in low Latin, no doubt, but perfectly intelligible to the upper classes of French and English. A translation of Vitruvius published in Paris in 1547, in the French vernacular, contains a kind of apology that it is intended for workmen and others who do not understand Latin. The movement of the sixteenth century was largely influenced by the voyages to foreign lands, the influx of foreigners in the various European capitals, and the conviction, which had suddenly seized upon ambitious imaginations, that the world was bigger, and contained more in it, than the decaying Church had been willing to admit. During the third epoch,—that of the present century—artistic inspiration has been sought and derived mainly from printed books and illustrations, the art of photography having largely contributed to increase the general confusion of published precedents—and this in spite of extraordinary facilities of travel and almost equally extraordinary efforts of draughtsmanship.

The first of these movements, that of the thirteenth century, was a practical, general manifestation of artistic vigour. The second, in the sixteenth century, was a studious relaxation of religious discipline, a mental demonstration which affected everything that contributed to the enjoyment of life, from a Royal decree to a piece of buffoonery. The third, in our own time, has been mainly pictorial and scenic,—an affair of sentiment, fashion, and party-spirit, confined to only a portion of the community at large.

*The term "Artist."*

The very word "artist," in the course of the last hundred and twenty years, has obtained a meaning different from that it possessed during the preceding seventeen or more centuries. In low Latin, in Italian, in Spanish, the word *artista* meant one who exercised a mechanical art. Dr. Johnson, the first edition of whose Dictionary was published about the year 1754, defined an artist as the professor of an art, generally of an art manual; he also defined "artificer" and "artisan" as early date. In other English Dictionaries of early date "artist" is defined as one skilled in an art or a trade; and "artificer" or "artisan" as an artist or a mechanic, one who is skilled in any art, mystery, or trade, a handicraftsman. But in the year 1762 the literary autocrats of the Académie Française, in their great dictionary, so altered the old meaning of the word "artist" that it has come to be applied, both in France and England, solely to a person of æsthetic training and acquirements—one who draws, or paints, or models, or who makes designs on paper for buildings, furniture, jewelry, &c. One hears now such compounds as "artist-architect," or "art-workman," used by gentlemen and ladies who are immensely amused when a hairdresser calls himself an "artist in hair," a vain denomination to which he is traditionally entitled; and the "art tailors" of Bond-street have as much justification for their compound title as the self-styled "art-architects." Indeed, I have often wondered that practitioners of the lower arts should be allowed to monopolise the title of "workman," seeing that every Englishman who is worth anything at all, is or has been a working man. But a musician appears to be excluded from the fraternity of British artists; he or she, as the case may be, is called *artiste*, with an "e," and the word is printed in the italic character to show that it has been appropriated from a source other than the pure well of English undefiled.

*Foreign Artists in England.*

The periodical immigration of foreigners into this country, due to various causes, religious and political rather than commercial, has contributed in no small degree to enlarge its artistic capacities and develop its artistic sense. After the fall of the Roman Church in England, the condition of the arts was worse here than in any other part of western Europe. We had routed them from their original homes, and compelled them to seek miserable lodgings anywhere and anyhow.

We set up no new institutions in the place of those we had destroyed, and after the excitement of the sixteenth century had subsided in England, a century of native inaction, as far as the arts were concerned, followed. The nobility, who had the means of knowing what the artists of Italy, France, and Flanders were doing, sent to obtain their advice and assistance. In the days of the Stuarts, when a further influx of foreigners took place, the chief artists employed in England were not English, though some of them bore English titles and became anglicised in name and language. Sir Anthony Vandyk, Sir Peter Lely, Sir Godfrey Kneller, were foreigners who worked in England. The design of the numerous churches, the erection of which was superintended by Sir Christopher Wren, was, I feel sure, largely due to foreign assistance—for after carefully looking at some of Wren's works, and after comparing them with particular buildings erected a short time previously in Venice,—which Wren had never visited,—one is struck with marked resemblances in type and detail. Sir John Vanbrugh was of foreign lineage; the magnificence of his architectonic conceptions, the character of the works executed under his direction, betray their French origin, and the details prove it. Then there were the two brothers Adam, the "adelphi" who gave names to a series of London streets lying between the Thames and the Strand, and whose delicate designs for plaster ornamentation burst suddenly upon the town. The art which made them is known to have been the work of Italians whom the brothers employed, and it expired with the few pupils they left behind. Sir William Chambers was not born an Englishman, and many of his draughtsmen,—some of whom worked on the drawings of Somerset House,—were foreigners. If one carefully examine the English illustrated books on the arts, especially architecture, published during the last century, one finds that the names of the draughtsmen and of the engravers are almost invariably foreign, while the character of the work is entirely French. At the commencement of the Queen's reign Italians employed at the Mint executed the beautiful coins which bear her Majesty's image and superscription; and I think it may be fairly admitted that until the year of Jubilee, 1887, no Englishman had reason to be ashamed of the artistic character of his country's coinage. Even at the present day some of the Royal Academicians are foreigners, or of foreign lineage.

*The Great Arts To-day.*

I have attempted to realise, by an imperfect description, the feelings of the Medieval traveller on first catching sight of a tower or a spire; and even now when, halfway on the road—an ancient Roman one—between Dover and Canterbury, one gets a first glimpse of the cathedral towers, the effect—especially in the sunlight on a summer's day—is very charming and inspiring. But what must it have been to the worn and footsore, in all weathers, five hundred years ago? They knew that those towers marked the existence of a glorious and beautiful home of refuge and delight, where bed and board, and alms with which to continue the journey to Rochester and London, would be obtained. It is impossible to doubt the sincerity with which a man, under such circumstances, cried out, "The Lord is my refuge," "In His courts is peace," or "I was glad when they said unto me, Let us go unto the house of the Lord." When there now, once a week, one repeats those phrases as a sentimental exercise for spiritual comfort; but in the Middle Ages they possessed a definite meaning, conveying a recognition of substantial benefits received.

Again, the towers of a Medieval fortress were absolutely essential to its defence. A tower in those days was also often necessary to hold aloft a sun-dial, which was not only convenient but absolutely essential to every inhabitant of the town or village in which it was placed. But, at the present time, men consult their watches in preference to the town clock, or even that bell which every quarter of an hour during the session irritates the House of Commons; and modern fortresses are built to show little masonry or brickwork for big guns to attack—a tall tower being the very first thing in a siege to carry destruction into the ranks of its defenders. Nevertheless, few public, few large private buildings, are now considered complete without towers, some of which are erected for absolutely no purpose whatsoever;



and all are intended, in a technic as well as an æsthetic sense, to "break the sky-line" of the building. But I am bold enough to believe that no Græco-Roman artist, no Mediæval artist, ever of malice aforethought broke the sky-line of his buildings; or intentionally so grouped them as to secure what, in this pictorial and scenic epoch, is called a picturesque outline. If one study minutely the history of an old cathedral, both from written documents and from the evidence to be obtained of the building itself, it will be found that its course of life has been something like this. Early in the twelfth century (and sometimes earlier) it was erected and finished according to a general uniform plan, and in consonance with instructions received from headquarters. The masters who had the general direction of the artists engaged upon it were mainly ecclesiastics, and the master mason was the chief artist who worked on the building. Years afterwards, as population increased and civilisation advanced, a larger cathedral was required. Another plan was obtained from headquarters; and, without destroying the whole of the original building, additions were made to fit it to the new and enlarged plan, for I have no doubt in my own mind that the church services, which were then a principal part of the ordinary business of life, were carried on during the repairs. Ultimately, after the fourteenth century, for well known reasons, no more general uniform plans could be obtained, or they were not wanted. Additions or alterations were made by local artists as they were required. If a window did not give light enough, another and larger one was substituted, without any heed to what is now called "style." No attempt at what is now called "restoration" was made; and alterations were effected without regard to appearances, though the artists engaged expended their best talents upon the work. If a new chapel or chapter house, or any other adjunct was wanted, it was fitted on to the building in the place most convenient for its purpose; and, as a rule, the same happened to the municipal and the private edifices. The result was that, after three or more centuries of such alterations and additions, the cathedrals, the castles, the country-houses which had survived successive periodical contests, presented outlines of the most picturesque description—outlines rendered, in later centuries, still more picturesque from decay and wanton destruction.

The too enthusiastic study of Mediæval buildings in their ruined condition has partly led to the present methods of design. We have taken the plan and view of our cathedrals and churches as they came down to our forefathers of the sixteenth century, after three or more centuries of modification, and founded upon that plan and view the church and the cathedral of the present day. We have been utterly and wilfully oblivious of the regular and symmetrical form they both had in the plans of the thirteenth-century architect. We treat the modern country-house in the same fashion, and arrange a new building of our own time with every possible irregularity of outline, both vertical and horizontal, for the purpose of imitating effects which during the Middle Ages, and even later, grew naturally, or as circumstances demanded. Yet we are astonished that the shrewd British public fail to appreciate the true uses of architecture, that the run of a revived style barely lasts ten years, and that Governments desirous of erecting national monuments are as cautious in their dealings with artists as they are perplexed with the rapid changes of the artistic kaleidoscope. It was well said, three hundred years ago, "Nothing is lasting that is feigned; it will have another face than it had, ere long."

Then, as regards the employment of painting and sculpture in new churches, we give the enlightened world the same old versions, told in the same old way, of the once sole and universal story of Christendom. Does any one attempt to decipher them? Does any one ever try to read the sculptures upon the national and municipal buildings of the country? Does one ever ask oneself what the subject of most of them has to do with men and women of to-day,—with the life of the present time? It may be possibly due to some such feeling that the public buildings of our time are very little indebted to sculptors for their adornment; and, as to the art of painting, the question with the government or a municipality, even in these days when the nation consents to spend 75,000*l.* upon a framed picture, concerns rather

the number of coats of good oil paint to be used, than any subject to be portrayed, upon the walls.

Again, how do the once subsidiary arts of painting and sculpture use the liberty they have enjoyed in England since the sixteenth century? To study the progress they have made, one must go to an exhibition in London or Manchester, or some other big centre. There, after half a day spent in an agony of examination, equally divided between a catalogue of pictures and the pictures themselves, one retires with a sense of relief that such exhibitions are held only once a year; and if by accident a year be skipped, or even two years, the complaint is just loud enough to prove that, as a person of fashion, one wished to see the things that others say should be seen by the fashionable world. But take up a copy of the *Illustrated London News* or the *Graphic*. One is interested at once. It portrays current events, which make the history of the present time—the views of life as it passes before living eyes. Even in the late Madame Tussaud's Waxworks Exhibition the groups of men and women in whose fate and career one is and has been interested attract the artist and delight the crowd. But does an exhibition of modern sculpture cause delight? I cannot believe that a marble or bronze figure of a man, deprived of any architectonic surroundings, and perpetually fixed on a pedestal in the middle of a road or on the pavement, in fair weather and foul as we get it in this country, can ever delight or even interest the passers-by. Yet that represents the principle on which sculpture, freed from the tutelage of the master-art, is now invariably treated. If one could adopt only the spirit instead of the letter of the arts of former times, the ornamental parts of a new building, whether executed with a chisel or a brush, would be made perfectly intelligible to the mental capacities of ordinary people, and would relate to current events, to the habits and occupations, the sentiments and aspirations, of the living world. I feel convinced that this will again come to pass. I believe even that architecture, if professional education continue to be directed in its proper course, will re-assume its ancient pre-eminence as the master-art, and partly for reasons which are more political and social than artistic. Perhaps the youthful pluck of America, with its utter want of respect for the ties of tradition, may help the old country out of its present grooves. Bret Harte sounded the true note of emulation in the first verse of what "Miss Blanche Says," written and recited in Rochester, U.S.A., nearly twenty years ago:—

"And you are the poet, and so you want  
Something—what is it?—a theme, a fancy?  
Something or other the muse won't grant  
In your old poetical necromancy.  
Why one half you poets—you can't deny—  
Don't know the muse when you chance to meet her,  
But sit in your attics and moan and sigh  
For a faintest goddess to drop from the sky,  
When flesh and blood may be standing by  
Quite at your service, should you but greet her."

Instead of "poet" I pray you read "artist," or the title of any other genius, and for "flesh and blood" substitute the life of the present day and the current events of human existence.

#### *Present Worship of the Past.*

It is, nevertheless, impossible to treat lightly the actual triumph of archæology, due principally to the researches of the present century. There is no building of any importance mentioned in Holy Writ or any historical MSS.,—though, perhaps, not a vestige of it remains,—that the archæologist is not prepared to entirely rebuild upon paper; and further, he will support every item of his restoration with accumulated references and analogies. Museums are full, all over the world, of archæological curiosities, some of which are valuable objects of workmanship, dug from the surface of the earth, and emanating from pre-historic as well as historic times. It is also equally impossible not to admire the archæological knowledge, the æsthetic and phonetic skill, with which a new building can be at once invested with the character and appearance of an old one. This ostentatious love of the old is a fashion that must run its course, and the loud objections now raised to rendering a dilapidated edifice fit for actual use will doubtless outlast the century,—the sentiment, of which both are born, having served a good purpose in the present epoch of artistic unreality. It is, however, obviously ephemeral, for it is opposed to the known traditions of every country and every age in which the great arts have flourished and progressed.

To this worship of the Past,—to the belief half expressed even by intellectual critics that there were once men, not absolutely giants, who did things that cannot be done now,—may be attributed some of the diffidence with which the authorities in this country regard an architect, however talented or experienced he may be. This architect, perhaps, erects leasehold dwelling-houses which come to pieces after the wear of sixty or eighty or 100 years, and his critics seriously remind him that the Pantheon at Rome has endured for at least fourteen centuries. They conclude that the domestic architecture which adorned the Imperial City was executed with strength and beauty equal to the strength and beauty still visible in the few great monuments that have survived the attacks of Time and men. But architects know that if certain temples and amphitheatres are still standing, it is because they were built with extraordinary skill and strength. If buildings which once surrounded them have disappeared, it is often because they were not better built than those of the present day. The vast majority of the dwellings in ancient cities were not as well built as are those of our own time, and hardly a vestige of them has come down to us. Indeed, with the fear of an old anecdote before me, I do not hesitate to believe that the Romans made a vast amount of worthless mortar, which, like all the other rubbish of Mediæval builders, has disappeared. Lord Byron put the matter very neatly when he wrote—

Out upon Time, that never canst leave  
But enough of the past for the future to grieve!

#### *Female Competition.*

A noble feature is said by competent persons to await the arts of this country, and although no man ought to prophesy unless he knows, let me add, in concluding this Paper, a surmise as to the future. Since 1851 the State has expended money for the purpose of assisting the technic artist; the City and Guilds of London have also come to his assistance. Moreover, the architects, unaided by the State, have by their own energy, and with their own money, progressed according to their lights quite as fast as those who practise the lower arts. Much more is known at the present day of architectural history, and of the monuments of the world, than at any previous period of the national existence, and the power of artistic delineation recently acquired is amazing. What must come to pass before any real benefit can accrue from all this knowledge and skill is a closer relation between the technic, æsthetic, and phonetic artists, and between them and the architect. To secure this, the technic artists must rise in the social scale; indeed, measures are ripening which must take effect slowly, and be but slightly perceived at the time, to advance the skilled craftsman. Somewhere in the next century—and the present one has only nine more years to run—the male monopolist will have to contend with female competition, at least in all those callings or occupations that are considered "genteel"; or, in better language, in all the gentle arts. In Europe, less than a thousand years ago, men practised those arts which for the last three hundred years have been almost exclusively practised by women; and, at the present time, among the Eastern nations, all such arts are still the exclusive patrimony of men. But about a year ago I read in the *Times* a telegram from Calcutta, stating that "at the last primary scholarship examinations in Bengal eight out of twenty scholarships were awarded to girls." What a revolution of thought is concealed in those words! This was not in Bombay, among the commercial Parsees, nor in Madras, where the progress of native education is favoured by absence of caste prejudices, but in Bengal, among the Hindus, whose women are kept under lock and key with even greater strictness than was used by the ancient Greeks! As for England, the schools of art and the art academies show almost as many female students as male students; and in all the annual distributions of prizes at the Royal Academy and other similar institutions, and even at the technical schools, the young women came up to receive their prizes with the young men quite as a matter of course, or without attracting undue observation. In point of fact, out of a total of 2,119 exhibits in the Royal Academy Exhibition of last May, some 400 were by women; and one-fourth of the exhibits contributed by outsiders were by women. It may be confidently pre-



1 Oct 1890

PAGE OF DECORATIVE PAINTING AT RED CROSS HALL, SOUTHWARK.—BY MR. WALTER CRANE.



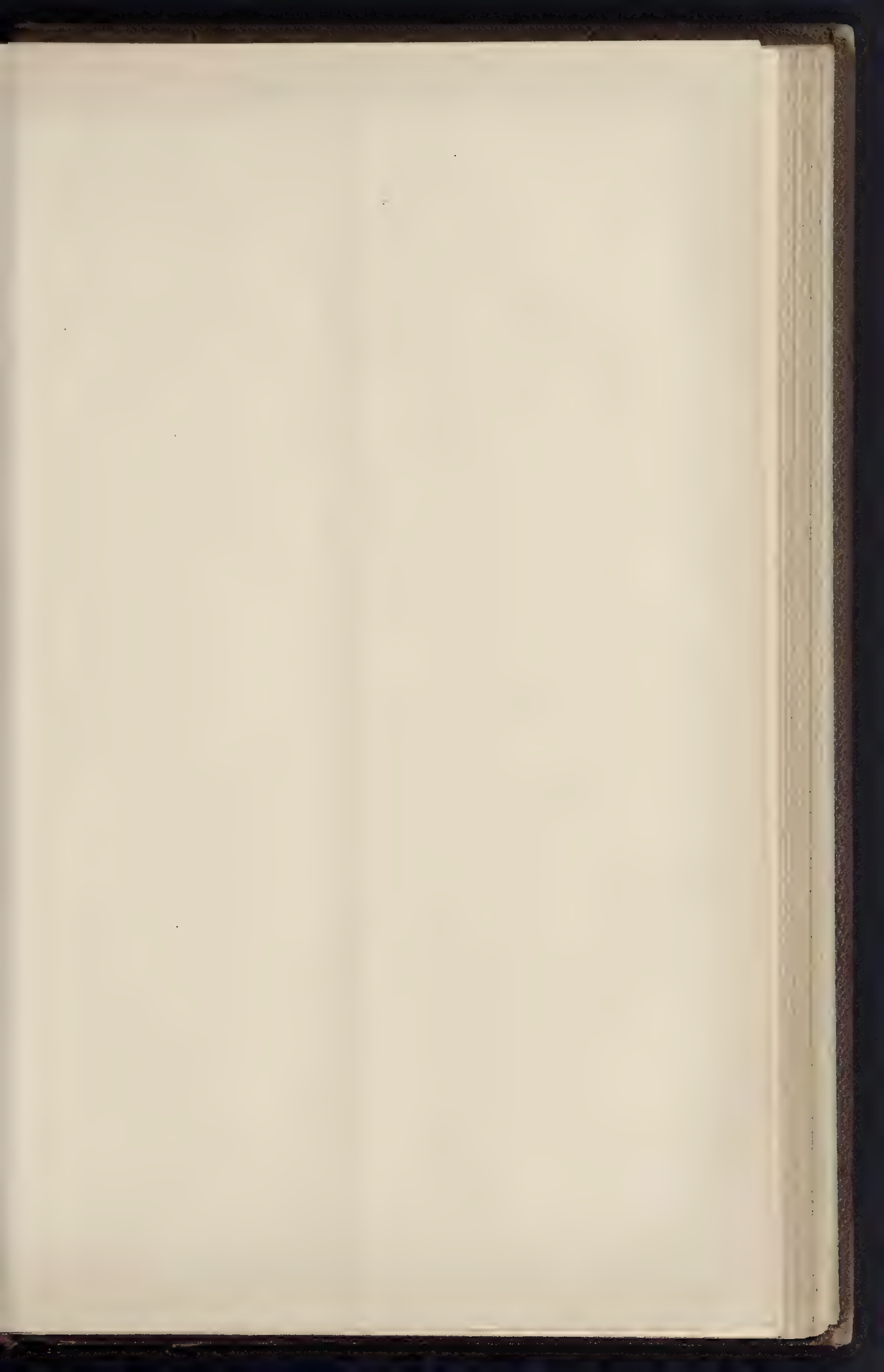




THE BUILDER, DECEMBER 6, 1890



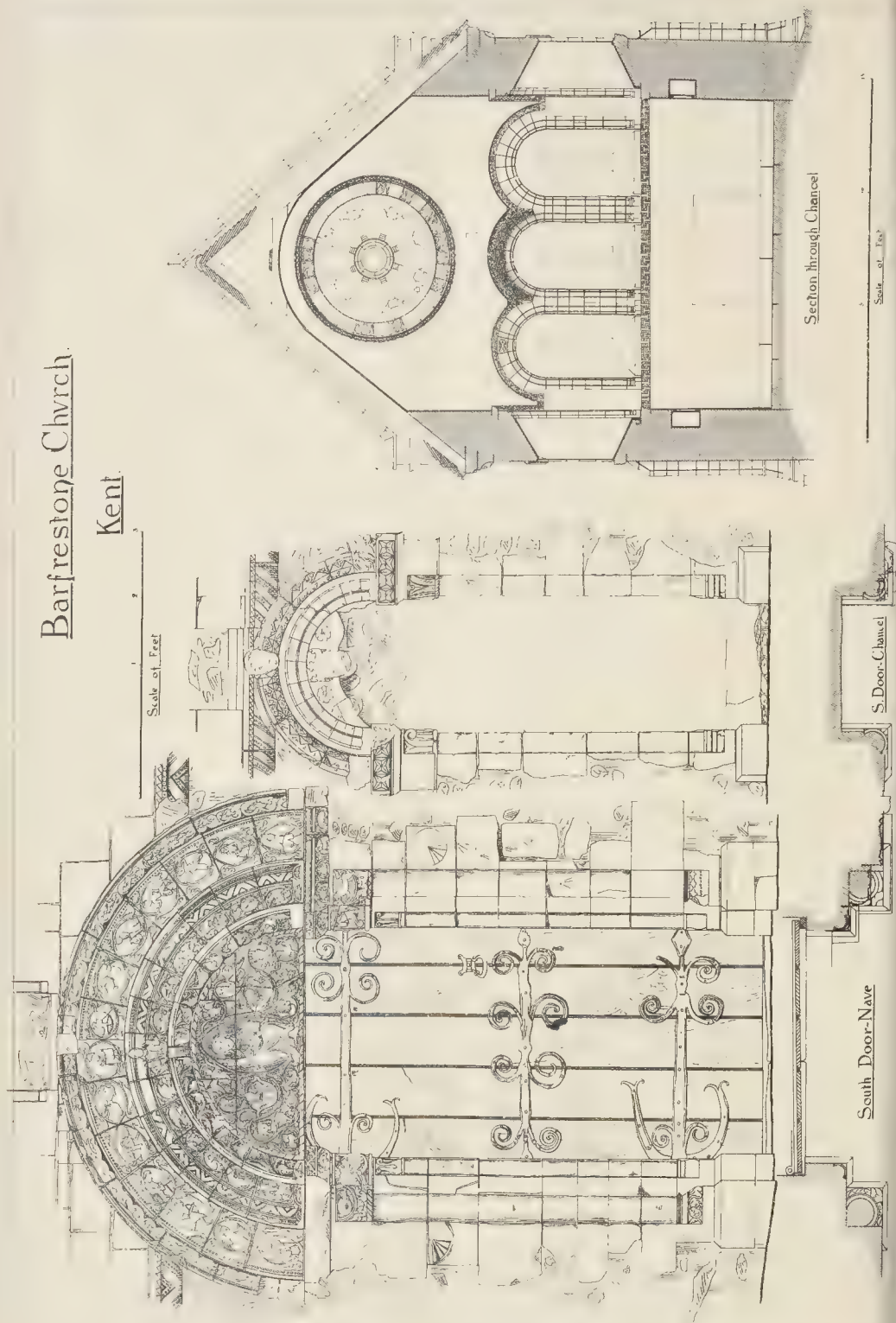




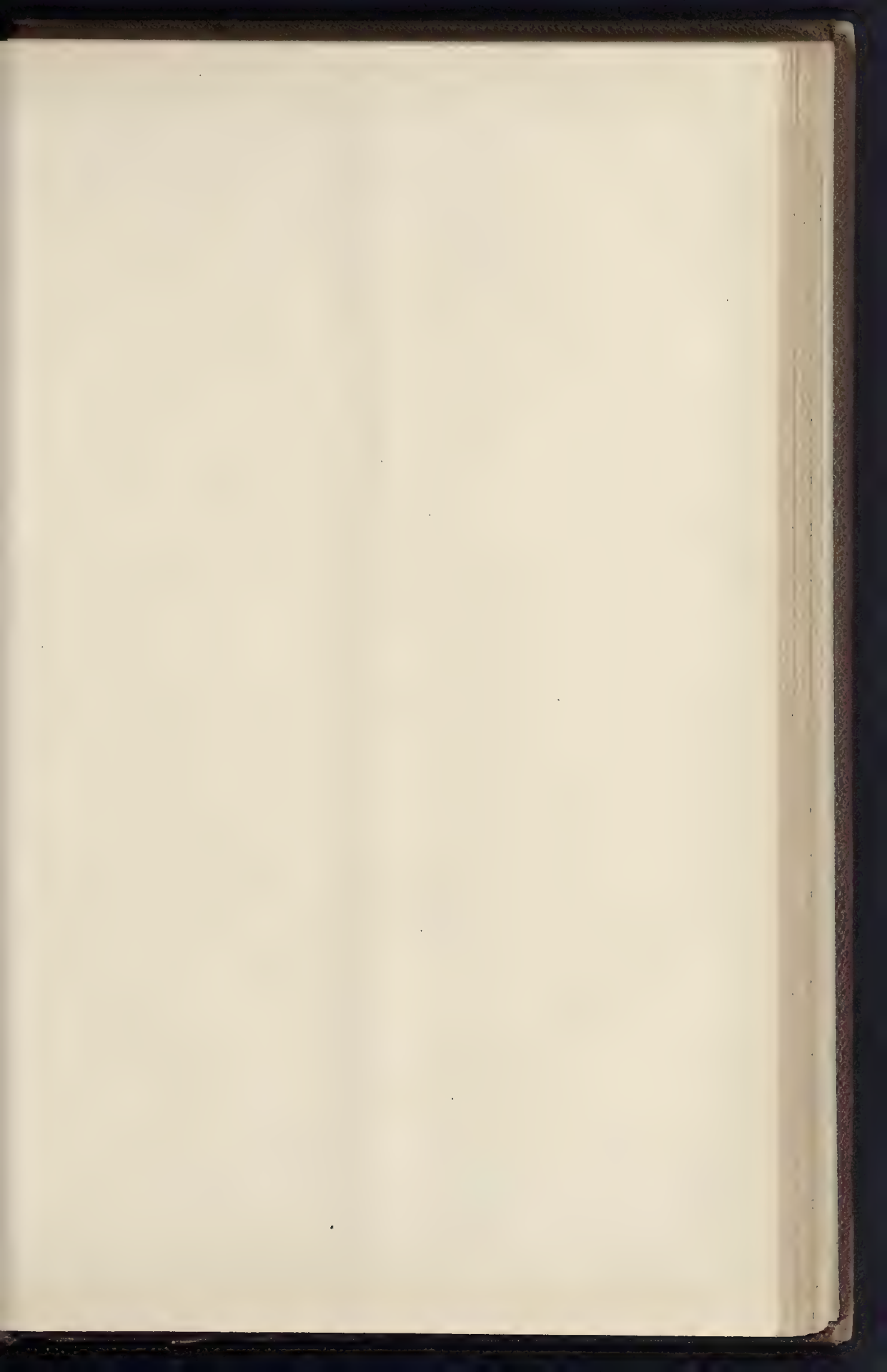
THE BUILDER DECEMBER 6, 1890

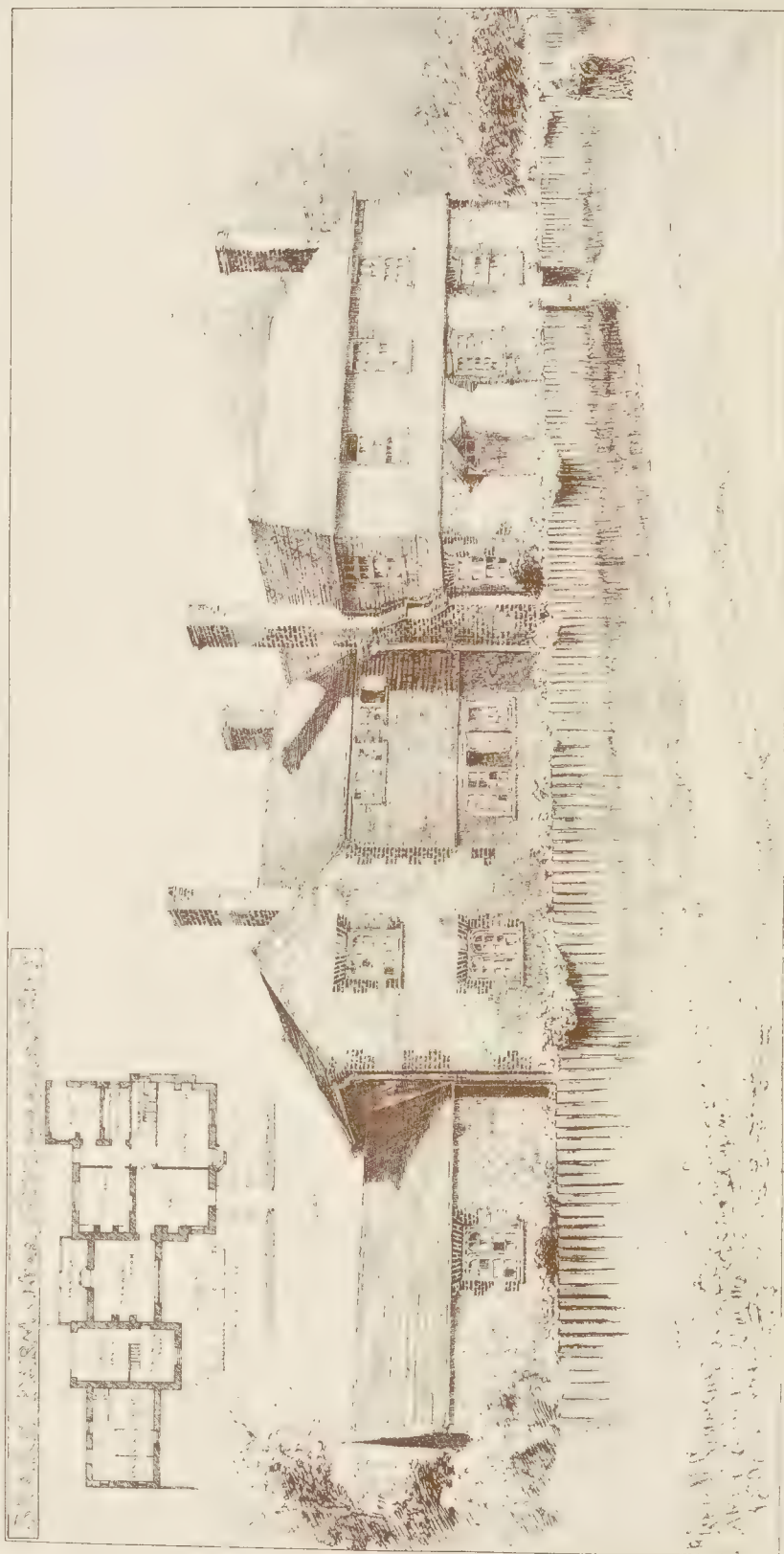
# Barfrestone Church.

Kent.

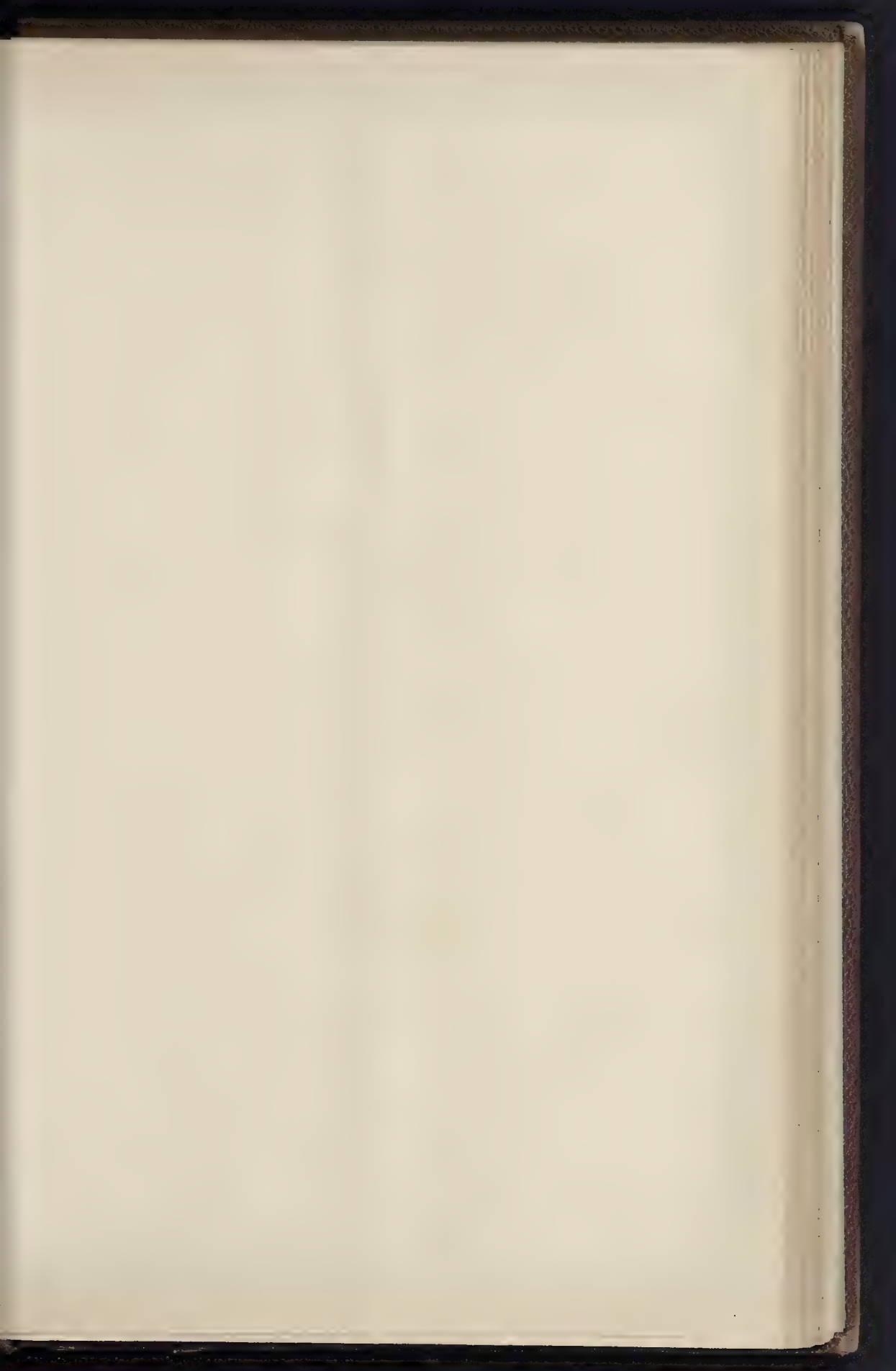




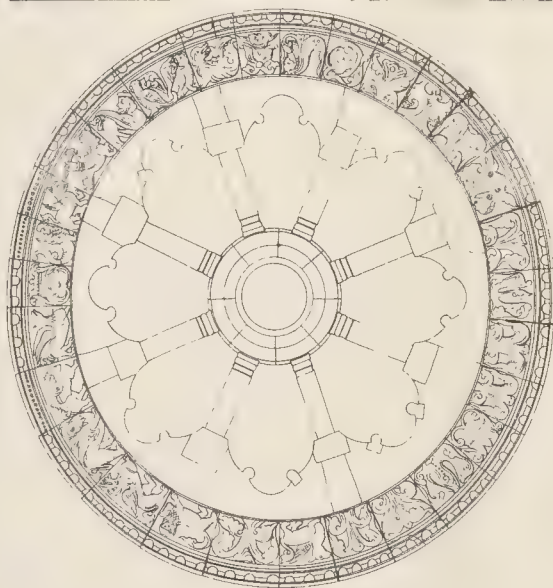






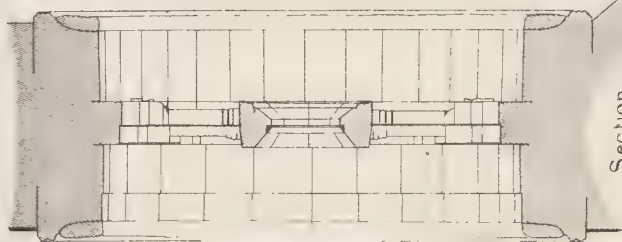


# Barfrestone Chvrch. - Kent

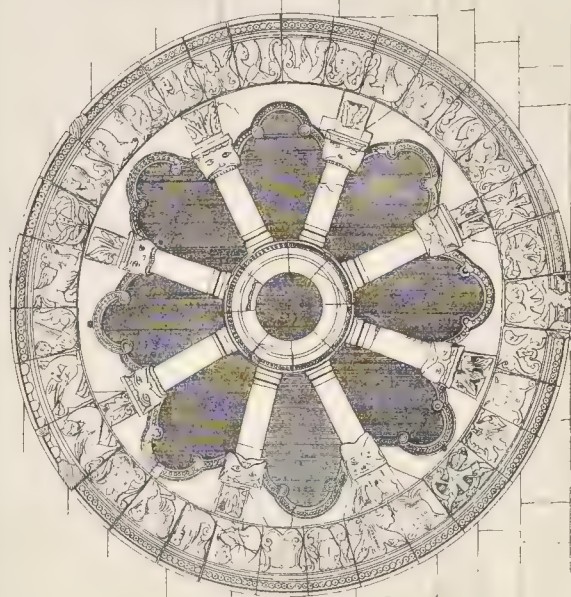


Inside.

## Circular Window in East End.



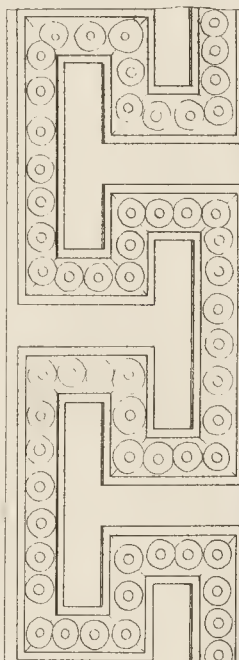
Section



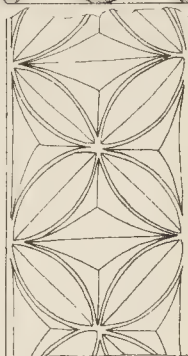
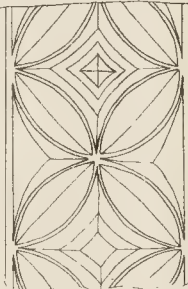
Outside.

Scale of Feet

1 2 3 4 5 6



Section



Section

String round Chancel.

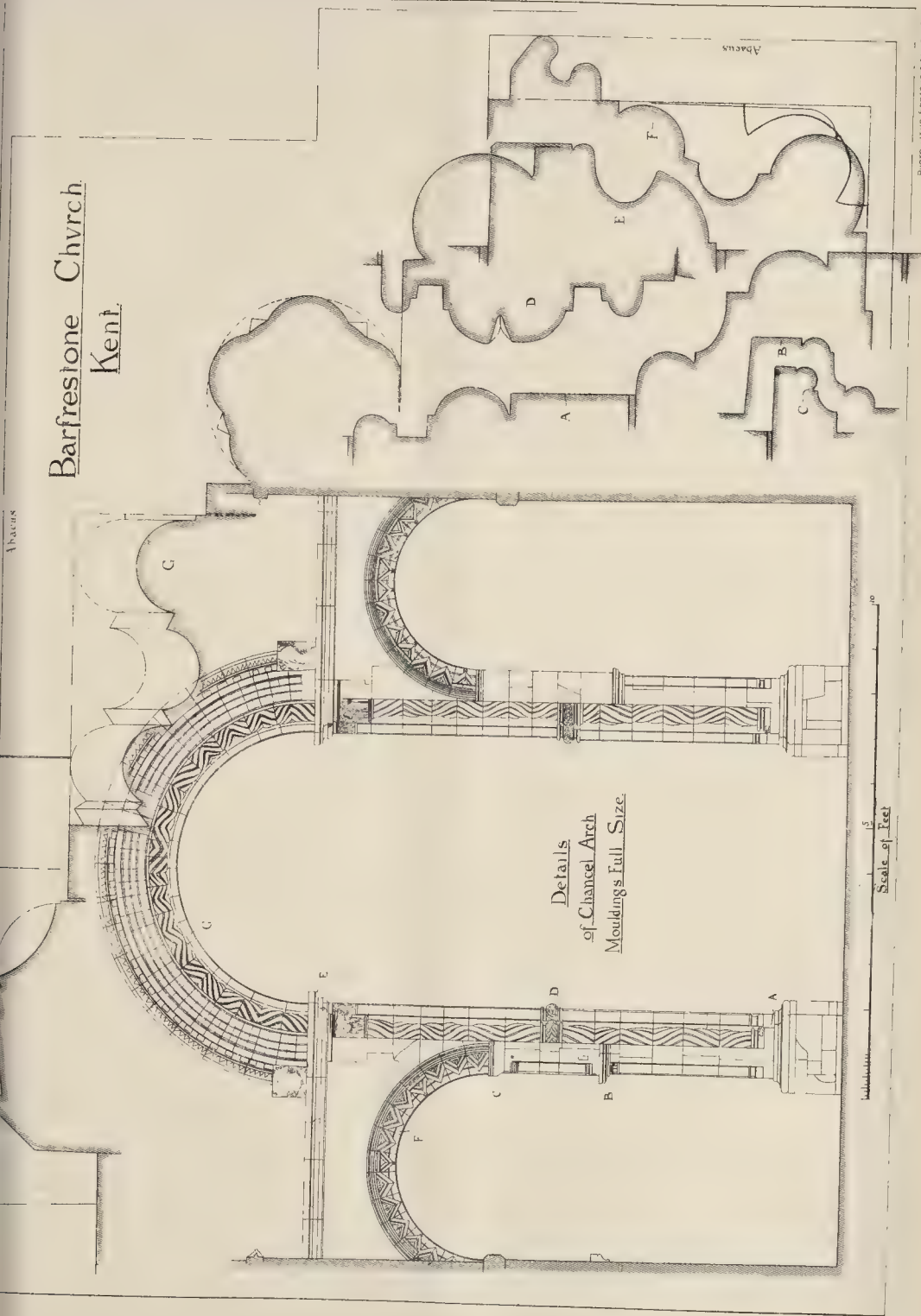
South Side of Nave.

Drawn by G. S. P. II. 4. 1. LONDON



# Barfrestone Chvrch Kent.

Apse

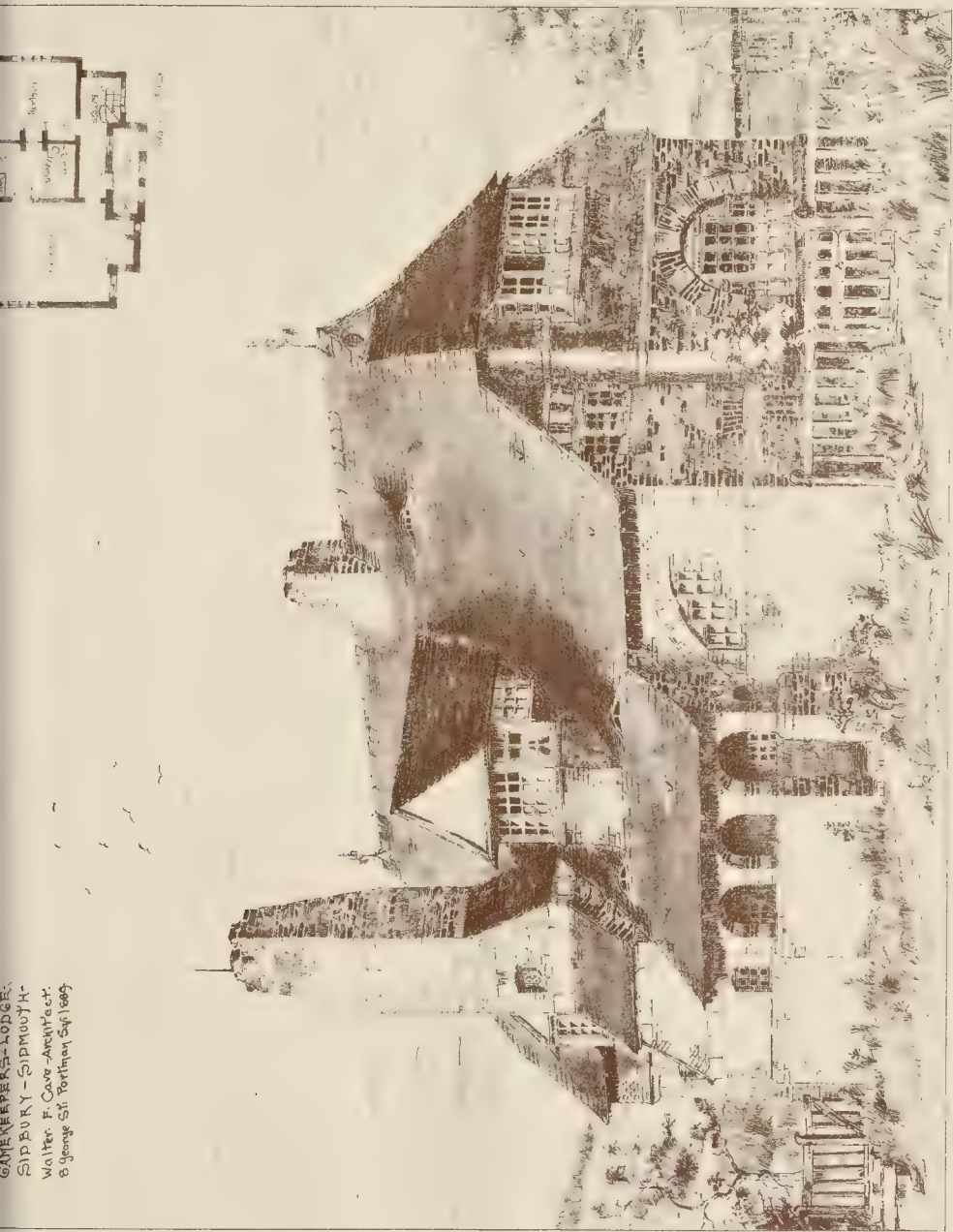


Details  
of Chancel Arch  
Mouldings Full Size.

Scale of Feet







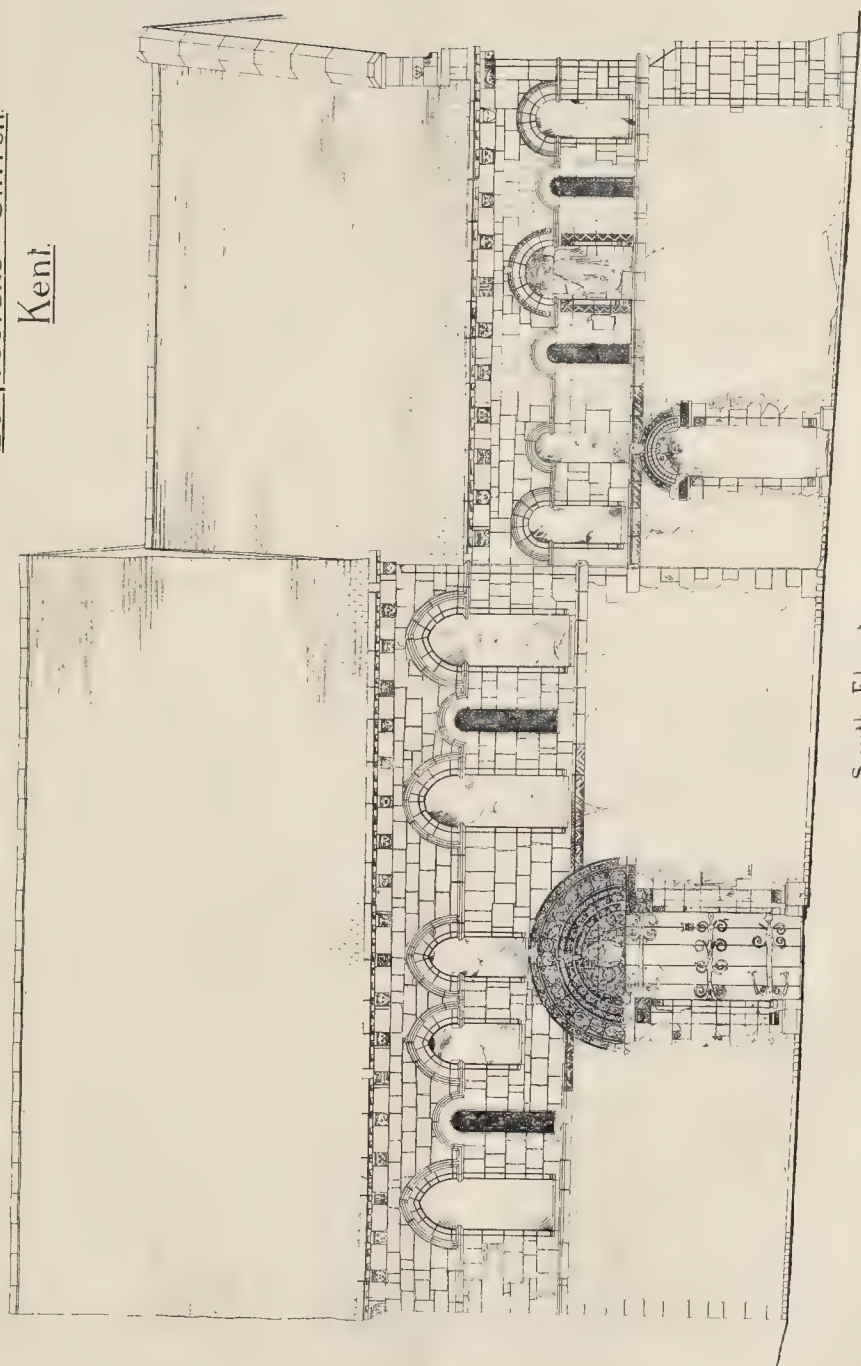
GAMERKERS LODGE.  
SIDBURY - SIDMOUTH.  
Walter R. Cave-Architect.  
B. George St. Portland Sep 1889

Front 4 - along " " - 1890

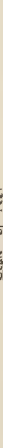




Barfrestone Chvch.  
Kent.



South Elevation.



A vertical scale of feet, ranging from 0 to 20. The scale is marked at intervals of 5 feet (5, 10, 15, 20). The text "Scale of Feet" is written vertically along the scale.

17



dicted that such gentle arts as painting and what is still called sculpture—but which is really only modelling—and design of every kind will eventually be practised by women, to the ultimate exclusion of men; that, in fact, the designer, pure and simple—who now often fancies himself an architect—will be sorely pressed by the “softer man” in their mutual struggle for existence; and that, consequently, the masculine arts of construction will regain the consideration attached to their practice in Roman and mediæval times. Masonry, carpentry, plumbing, wrought-iron work, and other such handicrafts, or arts as they used to be called, will be practised by educated men; and men of imperfect education, who are not skilled in such arts—who have no better knowledge of them than the ordinary unionist of to-day—will be relegated to their proper position of labourers. The sciences will not be much affected by female competition, and if what was once the master-art can maintain its original place among the sciences—if the fatal notion that draughtsmanship suffices to make an architect can be entirely dispelled—architectures may yet successfully resist the blandishments of the better half of human kind.

#### Fergusson's Three Points.

More than a generation ago, the late James Fergusson,—whose line of argument will probably be better appreciated in the next century than it was understood in his lifetime,—began the book which he called the best he had ever written, by an allusion to the bold paradox of Rousseau:—

“That the sciences and the arts had served only to debilitate and corrupt mankind, and that almost all the vices incidental to a state of civilisation could be traced to their pernicious influence.”

But Fergusson replied,—

“Cultivate the sciences and the arts. No . . . real and permanent good can be effected except from an improvement of knowledge; no higher or more elevated tone can be given on the all-important subjects of morals or religion, except by imparting a higher degree of refinement, and a better appreciation of the purely beautiful, to the public mind.”

In the same book, in a chapter on the Prospects of Art, he showed briefly the principal points to which he believed attention should be directed. “The first,” he wrote,

“Is to restore to art its progressive vitality, or, in other words, to give up all imitation of past styles, and to start at once with the determination to surpass all that has hitherto been done—to progress towards a degree of perfection that has not hitherto been reached. The second is to enlist a higher order of minds in the practice of the arts, or at least a higher class in society than has hitherto condescended to interfere with them. The third is to fit them with some higher aim than merely to please the dilettante or the connoisseur; for they must teach and elevate, or themselves suffer degradation.”

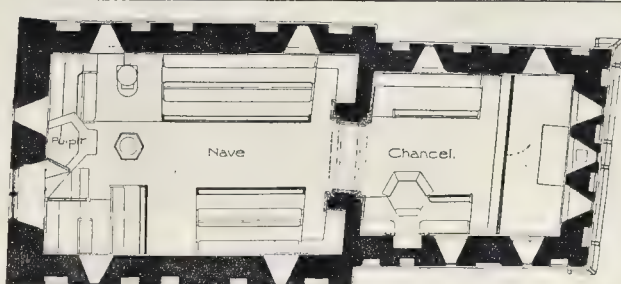
[Some notes of the discussion which followed will be found on another page.]

### Illustrations.

#### DECORATIVE PAINTING, RED CROSS HALL, SOUTHWARK.

A SERIES of panels, about 6 ft. by 11 ft. high, has been designed by Mr. Walter Crane to decorate the above hall, which has already been illustrated in this journal (interior view, Nov. 9, 1889). The first panel, illustrated in this number, has been painted from Mr. Crane's design and under his superintendence by Mrs. Russell Barrington, for the recess on the left-hand, near the entrance to the Hall. It is intended to commemorate an action well worth commemorating in painting, viz.: the courage and self-devotion of the servant-maid Alice Ayres, who in 1885 sacrificed her own life in saving those of her master's children at a fire in Gravel-lane, when she refused the means of escape herself till she had three times deliberately gone back into the burning house to bring the children out one after another, and was too exhausted to save herself, and fell on the pavement and died shortly after she was taken to the hospital.

Some of our readers will remember the incident, which made a great impression at the time, and we are glad to hear that such a noble subject from real life has been selected as a wall decoration; a subject which is peculiarly suitable in a hall intended for use by the poorer classes, as showing how heroic deeds may be done, even by those in a humble position, who are faithful to the idea of duty. The subject was suggested, we are informed, by Mr.



Plan of Barfreestone Church, Kent.

G. F. Watts, but we may feel sure it is one which Mr. Walter Crane would work at *con amore*.

Similar deeds of heroism in humble life are to form the other subjects, nine in all, with which the Red Cross Hall will ultimately, it is hoped, be decorated.

#### BARFRESTONE CHURCH, KENT.

THE measured drawings of this curious little Norman church, published in this number, were made by Mr. Alan C. Walker, a young Australian architect, during a visit to England to study English architecture *in situ*. It would be very desirable if more of the profession in Australia would spare time to come over and study the ancient architecture of the mother country, not by any means because we wish them to copy it, but because of the educating effect of the study of ancient architecture, of which the inhabitants of a country where there is no ancient architecture are deprived. The Americans are now producing very picturesque modern buildings, but they never did so until it became the habit of their architects to study and draw ancient European monuments. The Australians, as far as we may judge from illustrations of their architecture which reach us from time to time, are now in the same position in which the Americans were a quarter of a century ago; they have no architecture except bald repetitions of modern Renaissance work.

Mr. A. C. Walker has therefore set a good example to his contemporaries at home, and at the same time has produced a set of measured drawings which are of interest to English architects as a record of the peculiarities of a rather exceptional old monument.

There is a curious semi-Celtic appearance about some of the ornament which seems to indicate some special influence at work in the erection of the church, which has two other notable peculiarities, the curious irregularity in the setting out of the walls (as shown in the subjoined plan), and the fact that the wall arading on the south side of the nave shows slightly pointed arches, a very peculiar incident, as it is generally found that merely ornamental arches in Transitional buildings remained round-headed for some time after the larger constructive arches had assumed the pointed skew for constructional reasons. The curious skew in the plan has been accounted for by a suggestion that the church was built with stones brought from other places and which had been used in some previous building; this may be the case in regard to the decorative heading of the south door of the nave, which has very much the appearance of a later insertion; but the crookedness of the plan may be sufficiently accounted for as clumsy and careless setting-out on the part of some rude local masons, in all probability.

Partly owing to this crooked character there is an impression of early simplicity about the building which inclines one at first sight to regard it as earlier than it really is; an examination of the details, especially the moulding and carving of the capitals of the chancel arch, show that one can hardly give it an earlier date than 1100.

#### STAKE FARM, NEAR SEVENOAKS.

THE alterations, &c., to this cottage consisted in removing the front door from the centre and throwing the entrance-passage into the dining-room, turning the drawing-room into the hall,

and converting the existing cowshed adjoining into the drawing-room, with new bedroom and dressing-room over, fitting up stables and new drainage, plumbing, heating, painting, &c., throughout. The architect was Mr. Fred M. Simpson, of Westminster, and Mr. Edward Punnett, of Tonbridge, was the builder.

#### GAMEKEEPER'S COTTAGE, SIDBURY.

THIS lodge is built in red brick and Ham Hillstone, with dog-kennels and pheasant sitting-house attached. It is roofed in red tiles, and the work was carried out by the workmen of the estate. The architect is Mr. Walter F. Cave, and the drawing from which the illustration is taken was exhibited in this year's Royal Academy Exhibition.

#### THE ARCHITECTURAL ASSOCIATION.

THE fourth meeting of this Association for the present session was held on Friday, the 28th ult., at 9, Conduit-street; Mr. Leonard Stokes, President, in the chair.

The minutes of the previous meeting having been read and confirmed, the following gentlemen were elected members of the Association:—Messrs. E. S. Collins, E. L. Harrison, E. Jessop, G. B. Macdonald, G. A. Kerr, and A. H. Carter.

The Chairman stated that there had been no other nomination than the nomination by the Committee of Mr. P. J. Marvin to fill the vacancy on the Committee caused by the resignation of Mr. F. Hooper.

Mr. Marvin was then duly elected. Mr. William H. White then read a paper on “Arts and Artists in Former Times and Today,” which we print on another page.

Mr. John Slater, in proposing a vote of thanks to Mr. White, said he was sure they had listened with the greatest interest to the very instructive and amusing paper which Mr. White had read. They had had a most interesting excursion into the past. Mr. White had touched upon a great many topics that many of them, at one time or another, had thought about; but he had brought them together, and put them in such an interesting way, that he (the speaker) was sure they could not be other than extremely obliged to him. He had often been struck in thinking over Mediæval times, with the wonderful facility which undoubtedly did exist in those times for people to get about all over Europe. It was very surprising indeed at first sight; but he supposed the people who travelled then did not carry very much of their wealth with them. Most of those who travelled were not rich men, and consequently they were not so afraid of being robbed of their property as of being detained themselves, and made to work at their special craft for the benefit of those who detained them. There was no doubt that many of the little Italian towns known in the history of art, detained a painter or sculptor in that way, and kept him and made good use of him. Mr. White had very accurately described the influence of the Roman Catholic Church in the promotion of the arts. The monasteries were really missionary bodies in the true sense of the word; they were continually sending out people to teach not only the little learning that was then taught, but all the technic arts. And there was no doubt that there was much intercourse between the various countries and monasteries; and if any one monastery had an exceedingly good master mason, when a cathedral was to be built some



distance away, it was extremely probable that the monastery would be asked to send that man and some labourers to assist in building that cathedral; that would, probably, account for some of the similarities which were often to be found in buildings far apart; although with all the similarities found in buildings in different parts of Europe, they generally got a good deal of local colour, because necessarily a great deal of the work was done by local workmen, whose work naturally showed local peculiarities. Mr. White has alluded to foreign artists in England. Of course, it was well known that in many big houses that were erected the foreign artist and foreign workmen were employed. Mr. White had touched very properly upon the absurdity of putting towers into buildings where there was no necessity for towers or anything of the kind. He could not help thinking that in Medieval times no such instance would have occurred, as he was credibly informed occurred in this great city, of a very elaborate *flèche* being erected by mistake on the wrong roof of a semi-public building, which had three roofs, before the mistake was discovered and the *flèche* transplanted to the roof for which it was intended. The constructional value of that *flèche* could not have been much. They should all endeavour to learn and practice the maxim that they should not use ornament for the sole sake of ornament,—that they should not build their ornament, but ornament their building. That was a lesson which all, whether old or young, ought to take to heart.

Mr. F. T. Baggallay seconded the vote of thanks, and said that Mr. White had been rather better than his word; for, although he had only promised to give them an account of the past and present aspects of his subject, he had taken a small excursion into the future. Mr. White's little epitome of the career of art in the past was as clear and striking, or, rather, clearer and more striking, than any such epitome that he (Mr. Baggallay) had come across, and his account of art in the present day was exceedingly amusing, to say nothing of its accuracy.

Mr. W. J. H. Leverton said it had been suggested that the Freemasons had a good deal to do with the spread of architectural skill in the old times.

The Chairman said that Mr. White had told them how in the Middle Ages a band, or a school practically, of architects existed; and had mentioned Cluny. It would be interesting to have his ideas as to how the school of architects at Cluny was kept going. He (the speaker) supposed there was somebody at Cluny who taught those architects how to work—or did they merely examine? It was very true, as Mr. White had said, that in old buildings they found that the best painters and the best sculptors had been at work, and it was a great pity that this was not more often the case in modern times. But he thought things were improving, and there were some architects who now tried to get a good sculptor to do their sculpture and a good painter to do their decorative painting. He thought Mr. White had been a little severe on the modern sculptor, or “modeller,” as he called him. He (the speaker) agreed that a great deal of modern sculpture was atrociously bad, but he thought that that very often arose from the fact that it was paid for so badly. If a man was paid only 10s. for carving a bust they could only get poor work. It was part of a system which certainly wanted mending. If they could get the public, and perhaps even themselves, to insist upon having nothing but good work in their buildings, they would get on rather better. Mr. White had spoken a little sarcastically about “art-architects.” He (the speaker) did not know where Mr. White had got the term from. He knew that there was an idea abroad that some architects looked down upon all constructional matters, but he did not think that there was heard of an amusing combination by a gentleman who was a member of that Association, who called himself “architect and artist,”—words which were generally held to be synonymous, although evidently the gentleman in question did not seem to think so. He was sorry that Mr. White had tried to rob Wren of a good deal of the merit which was attributed to him. He had said that very probably Wren copied a good deal of his work from Venice. He (the speaker) hoped that was not so; at least, he would not say that, because he

admired the work, whether it was copied or not; but he would like to think that it was not copied. He thoroughly agreed with Mr. White in what he had said about towers. It was most absurd that every building larger than a semi-detached villa must have a tower. Every town-hall must have its huge tower. He did not agree with that notion himself, and he was glad that Mr. White expressed himself so strongly on the subject. Mr. White had also talked about picturesque skylines! When he (the Chairman) heard a man talking about “a picturesque skyline,” he generally put him down as an engineer, a “duffer,” or an outsider. Mr. White had said he hoped that architectural education would continue to be directed in its proper course. On that point he (the Chairman) said he thought the members of the special committee on education deserved some little credit for having embodied in the curriculum which they had submitted to the Association, a course of lectures on painting and sculpture. That was a step in the right direction, he thought. At present architects were too prone to think that painting and sculpture were quite distinct professions from their own. He thought that if architectural education continued to be directed in its proper course, that they would see better results in the future. He also agreed very cordially with what Mr. White had said about the worship of the past. He (the Chairman) did not wish for one moment to run down the past or what the men of the past did, but he thought one copied too much what they had done. If we studied what they did and tried to get imbued with their ideas, and if we tried to execute our work in the spirit of the old men, without using the identical mouldings or details, he thought that we should obtain better results. He did not think young architects should confine themselves to the study of the work of the past; but that they should also study the best work of the present day. If we were to watch the progress we were making, and try to surpass it and improve upon it, he thought we might progress still more rapidly.

The vote of thanks was then put and carried unanimously.

Mr. W. H. White, in reply, said that Mr. Leverton had remarked that he (Mr. White) had made no allusion to the Freemasons with regard to the work of the Middle Ages. He would ask that gentleman to read Mr. Wyatt Papworth's paper on the Superintendence of Medieval Buildings, which was in the “Transactions” of the Institute, and in which the writer referred to the Freemasons. If he might put it rather roughly he might say that the whole story of the Freemasons was exploded. As to the bands of travelling Freemasons, he did not think that anybody in our days had the slightest belief in that tradition. There was also another old idea about the existence of fraternities of bridge-builders. He believed that that idea was almost equally doubtful; but Mr. Papworth's paper was well worth the attention of every young man who cared to study it. Then with regard to Cluny. It was a story which had been told a great many times, and it had been best told by M. Viollet-le-Duc in his “Dictionnaire;” in fact most of those who had talked about the subject had got their ideas of it from Viollet-le-Duc. Cluny was destroyed at the great Revolution, and only a few remnants remain. Its great library was also destroyed at the end of the last century; but as far as education at Cluny was concerned, he believed that in all ranks of life men from all parts of Western Europe used to be sent there, very much as a Londoner was now sent to Oxford or Cambridge. As at Cluny, there was undoubtedly a great system of training for young men in the arts. There was no doubt also a body of seniors who looked very carefully into the doings of the juniors, and if they did not understand present methods of examination, they doubtless had something corresponding to it. With regard to what had been said about persons who called themselves “architects and artists,” he could not help thinking of the immortal Pecksniff, who was described as “architect, artist, and man,” and whenever he (the speaker) read about “art workmen” and “art architects” he always remembered that Pecksniff was “architect, artist, and man.” The chairman had expressed regret that he (Mr. White) had hardly written of Wren with sufficient respect in stating that his draughtsmen had evidently been foreigners. The fact was well known, he believed, and it must be remembered that Wren had an enormous

quantity of work all over the kingdom and all over London. Wren was also Surveyor to the Office of Works and Public Buildings. Wren was undoubtedly a man of great taste and scientific knowledge, but it was not to be supposed that he sat down with drawing-board and T-square to make drawings of the buildings the execution of which he superintended. The Chairman had also alluded to the subject of education, which was the leading topic of the day. He (the speaker) thought that the Chairman had almost hinted that painting and sculpture were hardly sufficiently appreciated; at least, that the teaching of painting and sculpture was hardly sufficiently cared for by the Architectural Association. All he could say was that architecture was such an enormous subject that, if the Association would teach architecture, everyone would be satisfied. The Association had enormous powers; but not sufficient to enable them to do all that they tried to do, and all that they wished to do. Too much was attempted, if he might be permitted to say so. As a very old member of the Association,—for he remembered the Association when its quarters were at Lyon's Inn Hall,—he remembered Professor Donaldson offering, in the name of the Institute, to take the whole of the Association in as students, to which he (Mr. White) and others objected. He also remembered Mr. Norman Shaw as the head of one of the A.A. classes. There was no person more desirous of seeing the Association prosper and become self-dependent than himself.

#### WORKMEN'S ACCIDENT INSURANCE IN SWEDEN.

THE new law of State insurance for Swedish workmen against accidents and sickness covers all workmen engaged in the building and kindred trades, saw-mills, deal-yards, quarries, all industrial concerns, &c. A State insurance institute is to be established, the employers paying the premiums. Insurance with the State institute is not, however, compulsory, provided the employer has his hands similarly insured elsewhere; but, nevertheless, the State guarantees the compensation in all such cases. The amount of compensation is the same in all cases, viz., for total disablement for life, an annuity of 20*l.*; for disablement reducing working capacity for life an annuity of 17*l.*; for temporary disablement or sickness, 14*l.* a day. Hands under eighteen years of age receive only three-fourths of the above sums. In addition to the two former cases, where the assured has children he receives 24*s.* a year for each one under fifteen years of age, the total compensation, however, not to exceed 24*l.* 10*s.* In case of death through accident the payments are:—For funeral expenses, 1*l.* 13*s.*; annuity to widow, 6*l.* 13*s.* 6*d.*; annuity to every child under the age of fifteen, 3*l.* 7*s.*, total, however, not to exceed 17*l.* a year. The employer has to report the accidents to the nearest police authorities, who, after investigating the case, report it to the institute. Anyone dissatisfied with the decisions of the latter may appeal before the Stockholm municipal court within one year. The payments for sickness are made weekly and others quarterly, the premiums of the employers being payable half-yearly, and in case of non-payment they may be enforced as Crown debts. When insured with the State the workman enjoys the great advantage of being insured from the moment he enters upon his work, whether notice thereof be given or not by the employer or himself. As to the rates of premium, the Minister of Public Works will divide them into classes, according to the risk of occupation, at first for three years, and afterwards every fifth year. Should experience prove any trade less risky it may be reduced in class. The State insurance also covers foremen and overseers of work. Should any person injured receive compensation from other persons according to general law the institute has the right of indemnification for any compensation. Moreover, employers as well as men may effect voluntary insurance with the State, but in no case must the sums assured be more than double those stated above. The State will establish and maintain the institute, the officials being one chief administrator, three directors, a secretary, a registrar, and a treasurer, and neither of the first four named must hold any other public office or position.



## COMPETITIONS.

**LICHFIELD UNION.**—The Guardians of the Lichfield Union having decided to erect a new infirmary, it was resolved to invite several architects to meet a committee of the Guardians, who were to select one gentleman to be recommended to the meeting of the Board for the appointment. This was done, and Mr. W. H. Woodroffe, London, was unanimously appointed.

**OSWESTRY NEW MUNICIPAL BUILDINGS.**—At the monthly meeting of the Oswestry Town Council, held on the 1st inst., the Mayor (Mr. A. Wynne Corrie) presiding, it was agreed to submit the accepted plans of the new municipal buildings, designed by Mr. Cheers, of Twickenham, to the Library Committee, the Works Committee, the Standing County Joint Committee, and the county and borough magistrates, for suggestion. The estimated cost of the new buildings is £2,000.

## ARCHITECTURAL SOCIETIES.

**LIVERPOOL ARCHITECTURAL SOCIETY.**—On Monday, under the auspices of this society, at a numerously-attended meeting in the Royal Institution, Colonnade-street, Mr. T. H. Harrison, F.R.I.B.A., read an interesting paper on the subject of "House Drainage." One of the principal purposes of the paper was to instruct younger members of the society, who propose to enter the profession through the ordinary ordeal of the examination, as to the best means of carrying out house drainage efficiently and under the best known sanitary conditions. By means of a flask and syphon tubes Mr. Harrison demonstrated the unreliability of some traps used as a protection against sewer-gas. He produced specimens of tree roots which had grown into and filled up drains, thereby showing the necessity for cement joints as against clay joints. He also described the best known system of providing efficient drainage for country houses where no sewers exist, as well as for others.

**MANCHESTER ARCHITECTURAL ASSOCIATION.**—The third ordinary meeting of this Association for the present session was held on Tuesday, at the Diocesan Buildings, Mr. T. Chadwick, A.R.I.B.A., President, in the chair. Mr. G. H. Willoughby read a paper on "The Advantages of Terra-Cotta relative to our Town and City Buildings," which he classified under five heads:—its durability as compared with stone; its comparative cost; its variety and permanency of colour; its advantages for internal decoration in the form of "faience"; and, lastly, a few general remarks. Each heading was exhaustively dealt with, and many buildings mentioned as illustrating its use. Much injury has been done to the progress and adoption of terra-cotta by the use of inferior material on account of cheapness. Manchester is far behind London in its adoption of terra-cotta, and to Mr. Waterhouse, who may be regarded as its most enthusiastic advocate, are the London people greatly indebted for the increased cheerfulness and lightness his buildings have given to their streets and suburbs. The application of "faience," or glazed terra-cotta, for internal decoration in some of our Manchester buildings recently erected was a recognition of its value as a permanent decorative material.\* Before concluding, Mr. Willoughby suggested several remedies to the objection of the use of this material. A vote of thanks, proposed by Mr. Davis Colley, seconded by Mr. Mee, and supported by the chairman and Messrs. J. S. Hodgson and Stelfox, concluded the meeting.

**EDINBURGH ARCHITECTURAL ASSOCIATION.**—The opening meeting of the thirty-third session of the Edinburgh Architectural Association took place on the 27th ult., in the Architectural Hall, George-street, Edinburgh. Mr. John Kinross, President of the Association, occupied the chair, and delivered an opening paragraph and recommendation as to the Bethnal Green Slum-clearance Scheme, of which we have already published the details at some length (see *Builder* for Nov. 1, p. 347):—

"Your Committee are carefully considering the question of raising the pavement level ultimately to be displaced by the proposed clearance in Bethnal-green, and their wish is to effect the clearance with as little inconvenience as possible to those who will have to be removed. Directly the area is acquired by the Council, the first step will be to close the most insanitary dwellings, and therefore it is necessary to make provision beforehand in the vicinity of the area for the accommodation of those who are first displaced. Your Committee were unable to take any actual step in the direction of recommending to the Council the hiring or buying of any vacant land for the above purpose until the Council had passed a resolution in favour of the scheme. The Committee, however, were aware that there are two vacant sites which are convenient

for the purpose, and after the adoption of the scheme by the Council they at once entered into preliminary negotiations with the owners of those sites. They have now ascertained that with regard to one of these the matter is extremely urgent, as the owners have received an offer to acquire the site for commercial purposes, and intend to accept this unless they receive an offer from the Council, without delay. As a matter of urgency, therefore, your Committee bring this question before the Council.

The site is situated between Gossett-street and Duke-street, and is only about 150 yards from the insanitary area. The ground is vacant, and building might commence immediately. The accommodation would be for about 250 persons in buildings of four floors. Your Committee are of opinion that a fair price for this site, if acquired by purchase, would be £4,800, or, if by way of lease, a rent not exceeding 240*l.* per annum. Buildings erected on the site would be ready for occupation within twelve months from the date of acquisition. Your Committee are aware that there is difficulty in great clearance schemes to find accommodation for those who are first displaced, and they feel bound to lose no opportunity of making some provision, so as to have suitable accommodation ready at hand. Your Committee therefore recommend the Council to pass the following resolution:—

"That, in order to provide part of the accommodation which will be required in connexion with the Boundary-street scheme, it is desirable that the piece of land in Gossett-street, now vacant and comprising about half-an-acre, should be acquired under Part 2 of the Housing Act, 1890, and that the Housing of the Working Classes Committee be authorised, subject to the necessary estimate being submitted to the Council by the Finance Committee, as required by the statute, to make arrangements for acquiring the same with the consent of the Local Government Board, by purchase or lease: if by purchase, at a price not exceeding £4,800, or if by way of lease, at a rent not exceeding 240*l.* per annum."

Mr. Rhodes moved, and Mr. Hutton seconded, an amendment referring the report back to the Committee, with instructions to state what measures were to be taken for utilising the land proposed to be acquired.

After considerable discussion the debate was adjourned till next week.

**Rosebery-avenue.**—The Improvements Committee, in their report, said:—

"We have had under consideration the plan for the northern portion of this improvement (lying between Farringdon-road and St. John-street-road), and we find that it is necessary to obtain the formal sanction of the Council to the construction of the subway, the same not having been specifically mentioned in the Act authorising the improvement. The Council is aware that a subway has already been provided in the completed portion, and it is intended to extend it the whole length of Rosebery-avenue. The section now reported on would be about 2,000 ft. in length, 12 ft. in width, and 7 ft. 6 in. in height, and is estimated to cost about 12,000*l.* We recommend:—

"(a) That Mr. J. Gray be appointed Measuring Surveyor in the Engineer's department, in the first class, at the commencing salary of 500*l.* a year; that his appointment be held during the pleasure of the Council, and be subject to the conditions that he be required to give his whole time to the duties of his office, and be not allowed to take any private business; that he shall not on retirement claim or be entitled to any superannuation or pension, and that he shall submit to any general scheme which the Council may adopt with respect to insurance for pensions or superannuation."

"(b) That Mr. E. Brown be appointed Measuring Surveyor in the Architect's department, in the first class, at the commencing salary of 500*l.* a year; that his appointment be held during the pleasure of the Council, and be subject to the conditions that he be required to give his whole time to the duties of his office, and be not allowed to take any private business; that he shall not on retirement claim or be entitled to any superannuation or pension, and that he shall submit to any general scheme which the Council may adopt with respect to insurance for pensions or superannuation."

"(c) That Mr. G. J. Ashton be appointed Measuring Clerk in the Architect's department, in the third class, at the commencing salary of 100*l.* a year; that his appointment be held during the pleasure of the Council, and be subject to the conditions that he be required to give his whole time to the duties of his office, and be not allowed to take any private business; that he shall not on retirement claim or be entitled to any superannuation or pension, and that he shall submit to any general scheme which the Council may adopt with respect to insurance for pensions or superannuation."

These recommendations were all agreed to.

**The Bethnal Green Slum-clearance Scheme.**—The Report of the Housing of the Working Classes Committee contained the following paragraphs and recommendation as to the Bethnal Green Slum-clearance Scheme, of which we have already published the details at some length (see *Builder* for Nov. 1, p. 347):—

"Your Committee are carefully considering the question of raising the pavement level ultimately to be displaced by the proposed clearance in Bethnal-green, and their wish is to effect the clearance with as little inconvenience as possible to those who will have to be removed. Directly the area is acquired by the Council, the first step will be to close the most insanitary dwellings, and therefore it is necessary to make provision beforehand in the vicinity of the area for the accommodation of those who are first displaced. Your Committee were unable to take any actual step in the direction of recommending to the Council the hiring or buying of any vacant land for the above purpose until the Council had passed a resolution in favour of the scheme. The Committee, however, were aware that there are two vacant sites which are convenient

for the purpose, and after the adoption of the scheme by the Council they at once entered into preliminary negotiations with the owners of those sites. They have now ascertained that with regard to one of these the matter is extremely urgent, as the owners have received an offer to acquire the site for commercial purposes, and intend to accept this unless they receive an offer from the Council, without delay. As a matter of urgency, therefore, your Committee bring this question before the Council.

The site is situated between Gossett-street and Duke-street, and is only about 150 yards from the insanitary area. The ground is vacant, and building might commence immediately. The accommodation would be for about 250 persons in buildings of four floors. Your Committee are of opinion that a fair price for this site, if acquired by purchase, would be £4,800, or, if by way of lease, a rent not exceeding 240*l.* per annum. Buildings erected on the site would be ready for occupation within twelve months from the date of acquisition. Your Committee are aware that there is difficulty in great clearance schemes to find accommodation for those who are first displaced, and they feel bound to lose no opportunity of making some provision, so as to have suitable accommodation ready at hand. Your Committee therefore recommend the Council to pass the following resolution:—

"That, in order to provide part of the accommodation which will be required in connexion with the Boundary-street scheme, it is desirable that the piece of land in Gossett-street, now vacant and comprising about half-an-acre, should be acquired under Part 2 of the Housing Act, 1890, and that the Housing of the Working Classes Committee be authorised, subject to the necessary estimate being submitted to the Council by the Finance Committee, as required by the statute, to make arrangements for acquiring the same with the consent of the Local Government Board, by purchase or lease: if by purchase, at a price not exceeding £4,800, or if by way of lease, at a rent not exceeding 240*l.* per annum."

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"(a) That, subject to an estimate being submitted to the Council by the Finance Committee, as required by the statute, a subway be constructed along Rosebery-avenue, between Farringdon-road and St. John-street-road."

We are also of opinion that persons who use the subway for laying their pipes and wires should pay for the privilege, and therefore we recommend:—

"(b) That it be referred to the Parliamentary Committee to consider and report on the advisability of applying to Parliament for powers to compel gas, water, and other companies to place their pipes, wires, &c., in the subway, and to enable the Council to charge a rent for such user."

In connexion with this subject, we have had under consideration the question of altering the position of a 48-in. water main belonging to the New River Company. This main runs from the New River Head to St. John-street-road, and for a distance of about 400 ft. will be disturbed by the formation of Rosebery-avenue. By the terms of the Act the main must be laid between the months of November and April, and we are anxious to arrange for the work to be commenced almost immediately, for it is obvious that unless it be completed by April there will be a delay of nearly a year. The question now arises whether this main, for the short length which it will traverse Rosebery-avenue, shall be inside or outside the subway. If it be placed inside, a considerable difficulty presents itself, because the sewer will be laid under the subway, and we are advised that it would be utterly impossible to clear the ground and construct the sewer with the subway above it, in sufficient time to enable this large main to be laid down within the time specified. We are informed by the Engineer that if this main were to be laid under the subway the very serious delay indicated would be avoided, and that as it serves as a conduit for feeding the supply pipes it is not subject to a high pressure, and consequently not liable to be disturbed like an ordinary service main. The service main for the supply of the locality would be laid inside the subway. The matter being one of some importance, we have felt it our duty to report to and seek the

\* No doubt, but care should be taken to give to the tiles the adequate mortar keying with the plaster. For want of this precaution much inconvenience, and even danger, has been experienced, we hear, with regard to the internal decorations of the National Liberal Club.—Ed.



instructions of the Council thereon. The completion of this important improvement is so urgently desired by the Council and the public that we believe that any avoidable delay would not be sanctioned by the Council. We therefore recommend,—

(c) That the 43-inch water-main belonging to the New River Company be laid outside, and the service main inside the subway of Rosbery-avenue."

These recommendations were agreed to, and after the transaction of other business the Council adjourned.

## BUILDERS' BENEVOLENT INSTITUTION.

### ELECTION OF A PENSIONER.

An election of one pensioner on the funds of this Institution was held at the Offices, 4, Vernon-place, Bloomsbury-square, on Thursday, the 27th ult., Mr. W. Shepherd (President) in the chair. There were five candidates for the one vacancy, viz., one man and four women.

Shortly after the close of the poll, the scrutineers (Messrs. T. Stirling and T. F. Rider) announced the result of the poll to be as follows, viz.:—Charles Sabey, 97, St. Peter's-street, Islington, aged 71, builder (third application), 1,636 votes; Margaret Alice Richardson, 5, Preston, North Shields, aged 66, widow of T. B. Richardson, builder (fourth application), 1,297 votes; Mary Ann Shapland, 132, Stamford-street, Lambeth, aged 71, widow of William Shapland, builder (third application), 1,241 votes; Elizabeth Darby, 2, Sangora-road, Clapham Junction, aged 81, widow of Edward Darby, builder (first application), 3,227 votes; Bessy Webb, 314, Old-street, E.C., aged 80, widow of Robert Webb, builder (second application), 1,555 votes. The successful candidate was therefore declared to be Elizabeth Darby, whose late husband subscribed to the Institution from the time of its foundation.

The Chairman regretted that the Committee had the painful duty of sending away four deserving candidates through want of funds. The building and allied trades numbered 5,000 firms within the Metropolitan area, yet only one-tenth of that number supported the Institution. He therefore appealed to non-subscribers for assistance.

Among the friends of the Institution (other than those already named) who took part in the proceedings were Messrs. C. Bussell, J. T. Bolding, W. Scrivener, R. Perkins, and G. M. Watts.

Votes of thanks to the chairman and scrutineers closed the proceedings.

## ROBERT BOYLE & SON, LIMITED.

The fifth annual meeting of this Company was held at the City Terminus Hotel on the 26th ult., when a dividend of 12½ per cent. was declared on the ordinary and deferred shares, one sixth of the profits earned being placed to the reserve fund, and a balance of 1,299, carried forward to next year.

The Chairman (Mr. Gilbert Wood) in moving the adoption of the report and accounts, which were unanimously carried, called attention to the continued satisfactory position of the Company, which still maintained the high position that had been won for it under the experienced management of Mr. Boyle. The business of the Company showed a steady increase from year to year, and he thought the shareholders were to be congratulated on the results achieved.

In moving the re-election of Mr. Robert Boyle as a Director, the Chairman said that the shareholders present would feel, with himself, that this was a more or less formal resolution, Mr. Boyle being practically the Company itself.

Mr. Robert Hobart (a Director), in seconding the resolution, which was carried unanimously, said he thought the shareholders owed a deep debt of gratitude to Mr. Boyle for his energy and self-sacrifice in the interests of the Company. He devoted his whole time to its affairs, and the best proof of his labours on behalf of the Company was the fact that, in the face of the keenest opposition, and the numerous attempts that were being made on all sides to successfully compete with the Company, the dividends had been maintained at so satisfactory a figure.

The other Directors for the year and the Auditors having been unanimously elected,

Mr. Robert Boyle, in acknowledging the unanimous vote of thanks accorded to the Board and to himself as Managing Director, said: I beg to thank you on behalf of my co-Directors and myself for the very cordial manner in which you have recorded your approval of the report which has been submitted to you. When the prospectus of this Company was issued five years ago, I showed the confidence I had in the business by taking practically the whole of the purchase-money in shares in the Company. I holding fully three-fourths of the shares issued, to which I have added as opportunity divided of 10 per cent. each year for the first five years, which period having now elapsed, you are in a position to judge as to how I have fulfilled my undertaking. I trust, as I also believe, that the next five years will be equally as successful, the

demand for the ventilating and sanitary appliances of the Company increasing every year, both at home and abroad. The latest improved form of the self-acting air-pump ventilator is giving great satisfaction wherever used, and though of superior power and make, being constructed of the best rolled steel plates, galvanised, and the workmanship of the highest class, is sold at about 50 per cent. less in price than the inferior forms previously manufactured. The foreign agencies are progressing satisfactorily, the air-pump ventilator and other appliances being applied with continued success to an ever-increasing number of important public buildings in Germany, France, Russia, Belgium, Italy, Spain, Holland, Denmark, and Norway and Sweden, also America and Australia. You will doubtless have seen from the published accounts that I have during the past year visited Egypt, India, China, and Japan, and I believe a good foundation has been laid for an important extension of the Company's business in those countries, where we have already ventilated a large number of Government and other public buildings. It is my intention to proceed early next year to South Africa, where we have always done a large business, but which I believe to be capable of considerable development if systematically worked up, and I trust at our next annual meeting to be able to submit to you, as the outcome of my endeavours, results which may be considered satisfactory. The proceedings then terminated.

## Books.

*Estimating: A Method of Pricing Builders' Quantities for Competitive Work.* By GEORGE STEPHENSON. Second Edition, carefully revised. London: B. T. Batsford, 1890.

*Repairs: How to Measure and Value them. A Handbook for the Use of Builders, Decorators, &c.* By GEORGE STEPHENSON. London: B. T. Batsford, 1890.

IT is strange that amongst the immense number of books which have been produced on various matters connected with building so few have dealt in a thorough manner with the subject of estimating. Yet its importance can hardly be overrated. A builder builds in order that he may gain a livelihood and, therefore, a profit, and, unlike almost every other tradesman,—he undertakes in advance to produce for a certain price something differing in many respects from anything that has ever been produced before. One would expect, therefore, that estimating would be universally based on scientific principles. This, however, is far from being the case. Indeed, we fear that more than half the estimates made are based on prices partly traditional and partly got by rule of thumb. It has been our lot on several occasions to examine the same bills of quantities as priced by two or three competing firms, and we have always been struck by the marvellous diversity in the prices set down for the same thing,—a diversity to all appearance wholly unwarranted. And to make the matter worse, these diversities are most marked in the items of labour only, where surely we might almost expect identity. A London builder, carrying on a large business, upon whom these considerations were once pressed, replied that if some of his prices were too low, others were too high, so that the result was the same! This happy-go-lucky fashion of pricing a bill of quantities, at all times dangerous, is rendered still more so by the condition now usual in building contracts, under which the priced bills of quantities become a schedule for the valuation of extra works. Thus a builder often finds himself called upon to do a considerable amount of work of a kind he has under-priced, and a contract that would have shown a profit leaves him with an absolute loss; a result due to want of reasonable care in preparing his original estimate and to nothing else. As all builders know, price-books are of little or no use in pricing a competitive estimate, and each competitor must construct his prices for himself. By few is the importance realised of doing this in a scientific manner. Of what elements does a price consist? Clearly of the following:—1. Material; 2. Waste; 3. Labour; 4. Carriage; 5. Profit, including risk.

1. The price of materials constantly varies with the market, and must be calculated and re-calculated as occasion may require.

2. Waste can be ascertained by observation, classification, and analysis, and may be expressed by a percentage.

3. The quantity of labour can be similarly arrived at, and can be expressed by a constant, which, being applied to the current rate of

wages, will give this element of the price. For example, assuming that the constant for a 2-in. four-panel square-framed deal door is .68 per foot per hour, and the rate of wages 9d., the labour would be 6.12d. (or about 6½d.) per foot superficial.

4. The cost of carriage may vary with every contract, but can usually be ascertained by inquiry, and expressed by a percentage on all items, excepting labour at the workshops.

5. Profit and risk.—In our opinion the proper mode of dealing with these elements is to price every item in the first instance at prime cost, and at the end of each bill to add for carriage, next a percentage for risk, and lastly a percentage for profit. The percentage for risk will obviously vary with the different trades, and in less degree that for profit also, being in the latter case greatest when the proportion of labour to material is highest.

We can see no reason why, in every builder's office, there should not be compiled from foremen's reports a series of tables showing the constants of labour and waste, which would render the calculation of prices an easy task.

The two books before us on "Estimating" and on "Repairs" deserve commendation, inasmuch as they are based on a theory of the calculation of prices which is in the main correct. They also contain many valuable hints and maxims of a general character, but their chief merit lies in the fact that they attack the "jumping" method of estimating with its results at once ridiculous and disastrous, and that they do this in the most effective manner, viz., by showing a better way. False ideas may be combated by argument, but only by true ideas can they be expelled.

At the same time we must point out that the books contain many faults. The first and chief of these is that the prices are too low. Good work cannot be done at these rates. The author seems to assume that every workman will always be working at his maximum of efficiency. There is also too little allowance for risk. 1s. 2d. is hardly enough for labour of mixing, throwing in, and levelling a cubic yard of concrete; nor 1s. 11d. for a superficial yard of Portland cement paving, ½ in. thick, laid in the best manner.

A further illustration of the same error is to be found in the price of 4d. each for fair ends to a 1 in. x 3 in. Yark threaded window sill, which is based on the sanguine assumption that a mason would do four of them in an hour! (p. 33). On the item, "extra only on common brickwork, for rubbed and gauged arches in best red bricks and pointing," the author remarks, "I should say these were not deducted from the red facings." This is to misunderstand the plain meaning of the item. Erroneous also are the statements that in pricing "over-sail one course of facing, there is the material in the projection to provide for" (p. 26), and that it is not usual to price rough relieving and segmental arches.

In conclusion, we must add a word of criticism on the following passage on money provisions (p. 6):—"It is a custom with many architects to say of provisions: 'These prices are P.C., and the contractor must add his profit, &c.' If the work is wanted by the contractor, he seldom adds anything to the so-called P.C. prices, but relies on the trade discount for profit. Where the discount is allowed, this often leads to a dispute between architect and builder as to whether P.C. means list prices or net after deducting the trade discount."

In the interests of honesty of estimating, we must protest against the practice of pretending to misunderstand the meaning of the term P.C. As every one knows, it means the price after deducting the trade discount, which varies from 5 to 40 per cent. There is no surer way of breeding disputes and irritation than for the builder in these cases to "rely on the trade discount for a profit." He can only succeed by outwitting the architect in collusion with the special tradesmen. He is almost certain to be found out, and all confidence in him is henceforth at an end.

*Asbestos: Its Properties, Occurrence, and Uses.* By ROBERT H. JONES. Crosby Lockwood & Son.

THE author of this admirable treatise on a subject of rapidly growing importance may be congratulated on having written a book that was really needed. Asbestos has hitherto, so far as we know, only been dealt with sectionally and in scattered communications buried



in encyclopedias, scientific journals, and blue books.

The work is, of course, largely and necessarily a compilation, but the compilation is very well done, and is interspersed with much useful original matter. The value of the book is greatly increased by the numerous and excellent illustrations with which it is embellished. The beautiful colotype plates merit special recognition, reproducing, as they do, with photographic fidelity, the curious fibrous structure of various specimens of the mineral.

Although asbestos is a widely-used word, and the general physical characters of the mineral pretty well known, it does not seem to be so well understood that the term is not a specific one, but is applied to a number of minerals differing considerably in chemical and other characters, but resembling each other in having some degree of fibrous structure. Asbestos is usually regarded as a variety of hornblende, which, by Dana, is classed as a sub-division of *Amphibole* and includes the following varieties:—

*Amianthus* which is characterised by the length of its flexible and elastic fibres. Common asbestos which is unctuous to the touch, often of a pearly lustre, and is heavier and less flexible than *amianthus*.

*Mountain Cork*, so called from its general appearance and power of floating on water, due to the multitude of air spaces it encloses. *Mountain leather*, *Mountain paper*, and *Mountain wood* are, as their names indicate, fibrous minerals of peculiar appearance. In addition there are included under the term asbestos fibrous varieties of *Pyroxene* and *Crocidolite*.

As regards chemical composition, the different forms of asbestos may be regarded as silicates of lime and magnesia, or alumina with varying amounts of water.

At the present time Canadian and Italian asbestos hold the market, and although other deposits has been met with that promise well, no serious competitor to the products of these two countries has yet come to the front. The principal mines are nearly all in the hands of a few large manufacturers, who require all they can get for their own purposes; hence the market price of the mineral tends to rise to a point that greatly restricts its general availability, especially as new applications for it are being constantly discovered. It is to be hoped that large and easily-worked deposits of suitable mineral will before long be discovered and worked, otherwise it may rise in value, as platinum has, to an almost prohibitive figure. Platinum, it may be remembered, was a few years ago purchasable at about 40s. per oz.; recently through the numerous fresh and extended applications of the metal, which have created a demand for it greatly exceeding the limited supply, the price has risen to 84s. per oz., a price that simply prevents its profitable utilisation in certain directions; and so it seems likely, in less degree, to be the case with asbestos, of which, however, there is plenty of a certain kind, but only a limited amount of the most useful quality.

To our readers the chapters dealing with the technical applications of asbestos will have special interest.

The employments of the woven and felted mineral in boiler-coverings, packings, and fire-felts, the millboard used for steam-joints, lining walls and safes, and even in the construction of library shelves, are all well known.

The value of asbestos curtains in theatres and similar places of amusement, for the purpose of confining the flames and smoke in the event of an outbreak of fire to the stage, is pretty fully recognised. Such curtains have obvious advantages as regards lightness, noiselessness, and infusibility, over those of iron or steel, which are apt to be cumbersome, clumsy, and noisy, in addition to their liability to rust when not in use, and to bulge and fuse when their services are most required.

Asbestos paint has proved itself an efficacious localiser of fire, when applied to woodwork and other inflammable materials. For packing and lining the walls of cold storage buildings and refrigerating chambers, its low conductivity for heat makes it very serviceable. As a roofing material it is also efficient in certain situations, and can be utilised in one or other of its manufactured forms.

We counsel our readers to get this exceedingly interesting little work for themselves; they will find in it much that is suggestive, and a great deal that is of immediate and practical usefulness.

*The Architects' Valuator and Directory of Architects belonging to Institutes and Associations in the United Kingdom.* Manchester: William Osborn. 1890.

We are at a loss to conceive whence the "Architects' Valuator" gets its name. It is simply a collection of trade prospectuses, and its value consists of being a convenient compendium of what a large number of manufacturers have to say in recommendation of their own goods. The appendix, giving a list of architects belonging to the recognised Institutes and Associations of the United Kingdom, is useful.

## Correspondence.

To the Editor of THE BUILDER.

### BRICK-BURNING.

SIR,—Mr. Jopling's letter in your issue of Nov. 22 calls, I think, for a reply from some one acquainted with the brickmaking process, and with your permission I will briefly give expression to my opinions from a brickmaker's point of view, as I am quite sure you will readily admit there are two sides even to this question.

From Mr. Jopling's letter it would appear that clamp bricks are burned with "animal and vegetable refuse, in all stages of putridity, and all kinds of indescribable filth;" permit me to say that clamp bricks are burned with breeze and ashes, these being the technical names applied to the coarser and finer residue of cinders extracted from rough dust, after the animal, vegetable, mineral, and other refuse has been most carefully sorted out.

In regard to the opinion expressed that the clamp brick is doomed, and that kiln bricks of a better quality can be produced at as low or lower cost, I would say that in the opinion of men well qualified to judge there is no brick which will stand the atmospheric influences of London so well as the clamp-burnt stock, which resists fire, frost, and the effect of smoke, &c. Many buildings have been erected in London within the last few years, and faced with these cheap kiln bricks, and I have watched with interest in several cases the disfigurement of many of these buildings through the decay of these same bricks, which may be seen in a state of disintegration. I think, however, I may safely say that no one can point to a properly burnt London stock brick deteriorating under similar conditions.

The great point of difference between a clamp-burnt and a kiln brick is that the former is actually burnt, and the clay and admixture of ashes forming a fuel, whilst the latter is only baked, although, possibly, at a great heat. Nature, ever beneficent, appears to have provided a clay in the proximity of London exactly suited to the requirements of the neighbourhood, and, although, I readily admit some kiln-burnt bricks of an expensive character may stand the influences of weather fairly well, I feel quite sure that the common class of wire-cut brick, which has recently been brought into the London market, will not stand like a clamp-burnt stock, which does not fly under the influence of fire, is unaffected by frost, and resists the insidious attacks of acids in sewage and smoke. The clamp brick is light in weight, though sound, and the granular skin gives the best possible surface for the adhesion of mortar or cement.

The proposed by-law of the London County Council is undoubtedly of the gravest importance to brickmakers in the London district, as I fail to see how it is possible to burn either clamp or kiln bricks without emitting smoke. The kiln really emits a denser volume of smoke than the clamp, as it is fired entirely with coal, whereas the clamp burns totally every brick-forming fuel, layers of breeze, which is practically smokeless, being used to "fire" the clamp. The clamp brickmaking interest supplying the London market would represent an output of some six or seven hundred millions of bricks per annum; the capital invested is very large, and the men employed many thousands. Some districts are almost entirely populated with families interested in this class of brickmaking, and the announcement of your correspondent that the trade is doomed is a big order. All brickmakers (with very few exceptions who are freeholders) hold their leases under a covenant to make a minimum number of some millions of bricks per annum upon which a royalty has to be paid, and if there is a possibility of closing brickworks, many of which have been in operation for very many years, and have been the means of employment to families for generations, I think the question of compensation may very properly be raised.

There is no doubt that the present agitation is caused through some West-end Vestries depositing the refuse of the parishes in two or three brickfields near populous neighbourhoods, and in which no facilities were provided for the destruction of the animal and vegetable matter, which was therefore openly burnt, and the smell arising from this has perhaps somewhat naturally, although erroneously,

been attributed to the burning of bricks, and has unquestionably been a cause of offence. I take it, however, that a large industry such as this should not be condemned through the indiscretion of two or three individuals. A BRICKMAKER.

### MESSRS. FLOCKTON & GIBBS'S PATENT.

SIR,—In our letter to you of October 31 we stated "The date of advertisement of this patent is, we believe, October 29, 1890."

Our attention has recently been drawn to an advertisement in the *Patent Journal* of October 8 of "Patent No. 19,624, Hockton & Gibbs." This printer's error led to our patent agent not noticing the advertisement.

He has applied to the Patent Office for a correction, and, at our request, for an extension of the time within which notice of opposition must be given. The Patent Office will correct the printer's error, but refuse to extend the time for notice of opposition beyond the 8th inst. We hasten to inform you of this. FLOCKTON & GIBBS.

Sheffield, December 3.

### BRIDGE CHAPELS.

SIR,—Your correspondent, "W. E. D. M.," might have added to his list the Chapel of St. Edmund and St. Edward the Confessor, formerly on the bridge over the Dart, at Totnes, Devon.

C. R. B. K.

## The Student's Column.

### HOT-WATER SUPPLY FOR BATHS, LAVATORIES, &c.—XXIII.

#### FAULTS AND SOURCES OF DANGER (continued).

It is possible for great trouble and annoyance to arise from a very trifling cause. For instance, we may mention a piece of loose material in the pipes. This may arise from the workman omitting to look through his pipes the last thing before using them, or it is usual for workmen, when leaving an unfinished job at night, to stop up the open ends of their pipes with a plug of hemp or other such material, which, if not carefully removed, may leave sufficient in the pipe to give the greatest trouble imaginable.

There is no fault so difficult to locate and remedy as that of what we may call a "floating obstacle," and it is a fault that may not show itself except at irregular intervals.

Sometimes a stoppage will occur by a fall of "fur," which will collect at one of the angles; this rarely occurs if the pipes are not interfered with, but if old pipes are being altered or worked upon in any way, it is one of the most common results to expect, as the jar of the tools and the hammering so often necessary in loosening old sockets, also loosens the incrustated deposit as a matter of course. The most common place for the loosened matter to collect is just by the taps, as the rapid passage of the water carries it to this point, and after working on old pipes in a hard-water district one or more of the old taps have to be removed to clear the pipe nearly always.

When noises are heard in the pipes of a hot-water supply apparatus they may arise from various causes, many of which are peculiar to new work and of which we have already spoken. In old work they are nearly always attributable to furred pipes, which, when sufficiently obstructed, prevent a free escape of steam, which, consequently, has to attain sufficient strength to force its way out with more or less violence according to the resistance it experiences.

When the pipes are clear the rapid circulation of the water carries the steam with it to the point where it can escape easily, i.e., to the expansion-pipe, but when the pipes are closed the circulation is retarded, and the steam requires to make its exit faster than the water can convey it.

This trouble is always conspicuous by its gradual growth, but when professional assistance is called in, it is, of course, usually, at its height, as the occupiers of the building nearly always allow it to go on until the noises are positively alarming, when it is necessary to take down the furred portion of the pipes and replace them with new. In almost every instance the pipes nearest the boiler will be found in the worst condition.

#### ACCIDENTS AND SOURCES OF DANGER.

An apparatus of the kind under discussion may be said to be perfectly safe in a general way, but, like everything else, it is subject to accidental circumstances, which in this instance are often sources of real danger. The element



of danger is steam, but this is quite harmless if it is not confined, and has free exit and escape.

The expansion-pipe is provided expressly to ensure safety, but if it becomes stopped by any means its safety is instantly disposed of; but the stoppage of the expansion-pipe only will not usually bring about an explosion, as before this can occur the pressure exerted will relieve itself by way of the cold supply service, supposing this pipe to be clear, and, in fact, if there is any possible way for the steam to escape by the exertion of pressure, it will go this way before there is any likelihood of the boiler bursting, as we must remember that the boiler and pipes, &c., are of a strength that requires a very great power to bring about their rupture, and it is on this account that such accidents are so usually fatal to life, as when an explosion does occur the force, which is of a reading nature, is most destructive.

We may sum up the causes of accidents, by explosion at the boiler, as follows:—

1. Frost.—This is the general cause of such accidents, and it is really wonderful that the number is so very small from this cause. In the first place, some portion of the cold supply service to the cylinder is generally in the coldest place imaginable, such as the roof or a room just under the roof, and it follows, as a matter of course, that the expansion pipe is terminated in a similar position. Now, here we have the only two open pipes of the apparatus, with their extremities in a position most favourable for their being stopped by frost; we may take it for granted that in a simple form of apparatus, the contents of the reservoir will be brought down to a low temperature in four or five hours after the fire is extinguished at night, particularly in severe weather, and this leaves two or three hours (the coldest of the twenty-four) for the pipes to become frozen if it is possible for them to become so, and it must be remarked again that accidents of greater frequency from this cause ought almost to be expected.

There is not the least doubt that many and many a kitchen fire has been lighted in happy ignorance when it has been almost suicidal to do so; but there are, fortunately, many small things unknowingly done by servants and others that tend to obviate danger. For instance, there is no danger until steam is formed, and under a very high pressure; this can only happen if the boiler is a rapid heating one, and no water is drawn off. If we draw water we relieve the pressure, and, what is more, reduce the temperature probably, and the opening of the tap will most likely give indication that something is wrong. Then another source of safety is present in the fact that there is every possibility of the ice in the expansion-pipe melting (by the warmed water in the apparatus) before any steam is generated.

The conclusion we must arrive at in this matter is that all pipes in connexion with a hot-water supply apparatus that are situated in cold positions, particularly in roofs, should be well covered with some poor conductor of heat, such as hair felt or any woolen material or other substance that will prevent loss of heat by radiation.

Next in priority to frost as a source of danger is the practice of putting stop-cocks in the main (primary) flow and return pipes; this practice has already been referred to fully, and needs no further notice here, except to say that it should be condemned to the utmost of everyone's power.

Another possible cause of explosion is a shortness of, or exhausting, the water supply unknowingly; we say unknowingly, as should the failure in supply be noticed every one has sufficient sense to take some steps to avoid possible accidents. This cannot very well happen with the cylinder system of apparatus, and it cannot very well occur anyhow without the shortness of water becoming quickly apparent at the taps, but it was only quite recently that a serious accident from this cause was only escaped by the fortunate existence of a safety valve, as it appears the water had been drawn nearly all away overnight, and the fire had been lighted for some hours in the morning without anyone noticing the want of water, so that what little remained had been evaporated, and when the daily supply of water came in, some portion of it did its best to flow into the red-hot boiler, with results that need no describing. The force exerted in this instance was so great that the safety valve did not merely open but had the upper portion twisted up like a piece of crumpled paper.

The last source of danger there is to explain is "furred" pipes. This question has been practically exhausted in the previous papers, but it might be repeated that an accident from this cause, though possible, is highly improbable, as before any real danger need be feared the noises and violent shakings and vibrations must warn everyone to give the matter attention promptly.

#### OBITUARY.

MR. JOSEPH, F.S.A.—The death has just occurred of Mr. Joseph, of Brecon, in his sixty-fifth year. The deceased gentleman, who was formerly a banker at Brecon, was a Fellow of the Society of Antiquaries, and an old member of the Cambrian Archaeological Society.

MR. ROBERT SLATER.—The death is announced, at the age of 49, of Mr. Robert Slater, which took place on Monday night, at his residence, Holly Bush, Broomfield-crescent, Headingley, Leeds. According to the *Leeds Mercury*, Mr. Slater had achieved an enviable reputation as a sanitary engineer. He was called in to overhaul the drainage of Hawarden Castle, Clifton Castle, the Reform Club, Cookridge Hospital, and many other mansions and institutions in various parts of the country. Mr. Slater was a guardian of the poor, and also a member of the Corporation. He entered the Leeds County Council in January, 1886.

#### GENERAL BUILDING NEWS.

NEW POLICE BUILDINGS AT BROMSGROVE.—On the 25th ult. Mr. G. W. Hastings, M.P., Chairman of the Worcester County Council, opened the new police buildings, which have been erected by the County Council in the Crescent New-road, Bromsgrove. The total cost has been between 4,500l. and 5,000l. The new police-station comprises residences for the superintendent, sergeant, and a married constable, with a mess-room and dormitory accommodation for six single constables. A charge-room, six cells (with a corridor approaching), and a drying chamber are also provided and heated with hot-water apparatus. The Magistrates' Court is 50 ft. by 30 ft., by 22 ft. in height. The buildings were designed by Mr. Henry Rowe, County Surveyor, Mr. Tuckerville being clerk of the works, Messrs. Tilt & Weaver, of Bromsgrove, the contractors, and Messrs. Ward & Son, of Worcester, the hot-water engineers.

NEW HALL, KIDDERMINSTER.—A new building has just been erected in Lorne-street, Kidderminster which has been presented to the Baptists of the town. The building, which has been named Milton Hall, was built by Messrs. Bannan, of Kidderminster, from the plans of Messrs. Ingall and Sons, of Birmingham, and will seat 350 people. Its erection and furnishing cost about 2,000l.

NEW Y.M.C.A. INSTITUTE, BIRKENHEAD.—On the 26th ult. a new Institute for the Young Men's Christian Association was opened at Birkenhead. The new building is constructed of red bricks and terra cotta. It is situated in Grange-road, and has a frontage of 80 ft. The entrance in Grange-road gives access to the entrance-hall, and from this hall staircases lead down to the gymnasium, and up to the public hall, and to the reading-rooms, library, &c. On the ground floor, on either side of the entrance-hall is a shop, with cellar below, in the rear of the shops are the secretary's office and a small class or waiting room. On the first floor are the lecture-room or library, 28 ft. by 19 ft., and two reading-rooms. On the second floor are provided residential apartments for the secretary, committee-rooms, &c. The gymnasium has a floor-space of 70 ft. by 40 ft. At the Grange-road end is a visitor's gallery, and along the west side there are dressing and bath-rooms. The public hall, 86 ft. by 40 ft., and accommodating over 900 persons, is placed over the gymnasium, and has a gallery at the Grange-road end, while there are four class-rooms and retiring-rooms from the public hall. Caretaker's rooms and ample cellars and lavatories and conveniences in various parts of the building. The public hall, gymnasium, and dressing-rooms are heated by hot-water, and the reading-rooms, library, and class-rooms with open fireplaces. The rooms are ventilated by fresh-air inlets and foul-air extracting flues. The architect is Mr. William Wallis Baldwin, of London, under whose supervision and that of Mr. J. C. Ogile, jun., the work has been carried out by Mr. Alexander Bleakley, of Birkenhead.

CHURCH RESTORATION AT CASTLE BROMWICH.—On the 30th ult. the Church of SS. Mary and Margaret, Castle Bromwich, was reopened, after being closed for two months, during which time various works have been carried out. These comprise some structural repairs, a scheme of decoration by Mr. John Taylor, of Edgbaston; the placing of a marble pavement and steps in the sanctuary by Messrs. Bennett; and the insertion of four stained-glass windows. The windows have been executed by Messrs. Ward & Hughes, of

London, the canopy work being designed by Mr. Bateman, of Birmingham, the architect under whose superintendence the work has been carried out.

MEMORIAL SCREEN, PERABLES.—There has just been completed in the Parish Church of Perable, in the chancel memorial screen, the gift of Mr. R. T. Hamilton Bruce, of Edinburgh. The screen consists of three bays, each being divided into two portions by a representation of a tree stem, spreading out into branches, leaves, and fruit in the cusped head of the bay respectively, the vine in the centre, with apples and pomegranates on the sides. In the bays at left and right are painted the Ten Commandments. Above the bays are nine spaces or niches, each being filled with a kneeling figure representing Truth, Charity, Hope, &c. The work has been executed by Messrs. Cotter & Co., of London.

ST. PAUL'S CHURCH, GREENOCK.—It has been decided by the congregation of the iron church in Newark-street, Greenock, to erect a permanent church on the site at the corner of Bentinck and Newark-streets. Dr. Rowand Anderson, of Edinburgh, was entrusted with the preparation of the designs. The church consists of a nave 90 ft. long, 31 ft. broad, a choir of 30 ft. long and 21 ft. broad. At the west end is a vestibule, and on the north and south sides of this porches and stairs for access to a gallery over the vestibule. The nave is divided into six bays, five of which open into a narrow aisle on each side, serving only as a passage. On the north side, and occupying the space of two bays, is a transept. The choir has a north and south aisle. The one on the north side will be set apart for the organ. As the ground falls from west to east, it was taken of this to provide a hall under the choir and aisles, and vestry, session-room, lavatories, &c., under the north transept. Provision is made for the erection of a tower to the north of the choir aisle. The church will be lighted by the clearstory and large windows in the gables. The principal entrance is by a pointed arch doorway, flanked by windows which light the vestibule. The window above consists of eight lights. The window in the east gable is composed of six lights, with tracery. The gable is flanked with buttressed pinnacles terminating with crocketed spires. The aisles of nave have no windows, but each bay of the nave has a large three-light pointed window, with buttresses between. The tower is to be 40 ft. square at the base, 115 ft. to the top of the tower, and 180 to the top of the vane of the spire. The roofs, which will be covered with green slates, have their principal constructive parts made of steel. Pointed wood ceilings are framed on the under side, and divided into panels by mouldings, the main ones rising from stone shafts which rise from the floor.

NEW THEATRE, NEWCASTLE.—The new Empire Theatre of Varieties in Newgate-street, Newcastle, was opened on Monday. The new theatre consists of pit, with stalls separated from it by folding chairs. Above this is the first circle. On the second-floor are the private boxes. The upper balcony is on this level, and is provided with sitting and standing accommodation. The orchestra is nearly 30 ft. wide. The entire building is lighted by electricity. Ample exits are provided from every part of the house, all doors either sliding or opening outwards. Refreshment-rooms and cloak-rooms are provided on each floor. The general contractor is Mr. Alexander Pringle, of Gateshead. Messrs. Charlton & Co. are the electrical engineers. The whole of the works have been designed by Messrs. Oliver & Lesson, architects, of Newcastle.

A NEW CHURCH FOR TYNEWYDD.—On the 27th ult. the ceremony of laying the foundation-stone of a church at Tynewydd was performed by the Countess of Dunraven. The church is designed to accommodate about 400 worshippers. It consists of a nave, 63 ft. 6 in. long by 25 ft. wide, chancel, and organ chamber and vestry. The nave is lighted from the west by a five-light window, with foliated heads, and the north and south walls are pierced with two-light Early English windows, set alternately in the bays between the buttresses. The chancel has a three-light window with foliated heads, and two small traceried lights in the north wall. A sedilia and credence are shown on the south side of the chancel. The roof internally will be open to the apex, and constructed of unvarnished pitch-pine. The chancel roof is similar. The seating and furniture are to be of pitch-pine, and varnished. Externally the walls will be faced with grey stone, and the jambs and arches of the doors and windows are to be worked out of Bath stone. The roof, which is to be covered with green slates, with the ridge cresting will be broken over the chancel with a bell-sheaf. The church, including the whole of the seating and furniture, heating apparatus, and boundary-walls, will cost 1,500l. The architect is Mr. E. M. Bruce-Vaughan, and the contract is let to Mr. John Haines, of Cardiff.

PONTYPRIDD FREE LIBRARY.—On the 27th ult. the Pontypridd Free Library was opened by Mrs. D. W. Williams, Fairfield. The building, which was erected at a cost of 2,000l., from designs by Messrs. Potts, Sulman, & Hennings, of London, is situated in Gelliwasad grove. Mr. Julian, of Pontypridd, carried out the contract.



**NEW WESLEYAN CHAPEL, DOWNEY.**—A new Wesleyan chapel has just been opened at Downey, Cornwall. The new chapel is built of local stone, much of which was raised from the site itself. The exterior is covered with Portland cement, varied by the red brick quoins and arches of the windows. It measures 58 ft. by 34 ft., and the height is 20 ft. It will seat about 200 persons, and is lighted with thirteen windows of Gothic design, glazed with straw-coloured cathedral glass. The building is roofed with Delabole slate and is furnished with a rostrum and seats of pitch pine, mixed with American red pine, varnished. Mr. H. J. Snell, of Plymouth, is the architect, and Mr. T. E. Madams, of Liskeard, the contractor.

**WESLEYAN SCHOOLS, WILLENHALL.**—The new Wesleyan schools, Willenhall, have just been rebuilt on an enlarged scale, at a total cost, including fittings and furniture, of 2,000. Mr. Benjamin Baker, of Willenhall, is the architect.

**CHURCH RESTORATION AT WELSH ST. DONATS.**—The Church of Welsh St. Donats, near Cowbridge, Glamorganshire, is now to undergo substantial restoration. It is reported to be quite unfit for use at present. The tower and bell-framing is to be made good, and the works will comprise new floors, and passages in the tower, and a new chancel, new heating apparatus, new pulpit, lectern, altar, and seats, complete restoration of the old oak roofs, a new roof on porch, new chancel seats, and new oak doors, &c. A faculty has been applied for, and the architects who have been entrusted with the work are Messrs. Kempson & Fowler, of Llandaff.

#### SANITARY AND ENGINEERING NEWS.

**MATLOCK BRIDGE WATERWORKS.**—A report has been received from Mr. W. H. Radford, C.E., of Nottingham, in which he advises the company to take an additional spring from the Yoredale Grit. The spring yields 68,580 gallons a day, in dry weather. The water is here analysed by Dr. Frankland, and found to be of extraordinary purity and softness. The company have applied to the Board of Trade for a Provisional Order to increase their capital from 7,500*l.* to 20,000*l.*

**ELECTRIC LIGHTING AT WOKING.**—The growing town of Woking, which has hitherto been without any form of public lighting for streets or houses, has now adopted the electric light under the auspices of the Woking Electric Supply Company, Limited, of Palace-chambers, Westminster. A suitable site for the works has been secured on the north side of the London and South-Western Railway, in the vicinity of the London and Basingstoke Canal. Here, the municipal buildings have been erected, comprising boiler-house, engine and dynamo-house, offices, and stores, containing at present a plant capable of dealing with 4,000 lights, consisting of two multitubular externally-fixed boilers, fitted with donkey-pumps, circulating and feed-tanks on columns, &c. The engine and dynamo-house is a large and lofty building, containing two high-speed triple-expansion vertical condensing-engines, capable of indicating about 100-horse-power each (with a boiler-pressure of 150 lbs. per inch), at a speed of 340 revolutions per minute. The engines are coupled direct to two Kingdon alternators, wound for high tension of 3,000 Volts. The main parts of the system are excited by a continuous-current dynamo, driven by a belt. Each dynamo has a capacity of 30 amperes at a tension of 2,000 volts, or 60 kilowatts or Board of Trade units. The transformer system is in use in the district. The mains are insulated cable laid at the road sides in stoneware pipes. The surface cable contains all necessary distributing and regulating apparatus, together with electrical instruments and gauges. A 6-ton travelling crane spans the entire engine and dynamo house and is available for lifting the machinery. The plant as at present fixed is intended to supply 2,000 lamps in duplicate, but arrangements have been made with the view of extending its capacity may require. Water for feed and condensing purposes is obtained from and returned to the Canal by means of underground pipes, delivering into a sump below the cistern, to which it is raised by a special auxiliary pumping engine, which also works the air pump of the condenser. Limited, the tank the water flows to the surface, cools, and thus returns to the canal uninjured. The boilers, engines, dynamos, tank, water-heater, and crane were made by Messrs. King, Masterman, & Terry, of Kidsgrove, Staffordshire, under the management of Mr. S. H. Terry. Mr. G. Mann, the Secretary of the Woking Electric Supply Company, Limited, has superintended the erection of the plant, and has contended successfully with the many local difficulties incidental to the starting of an electric installation. Light has been given regularly since November 1.

**TAYPORT SEWERAGE, SCOTLAND.**—The sea outfall works here have just been completed at a cost of 3,080*l.* The population of Tayport is about 3,000, and the contract has included new pipe sewers in every street. There are two sea outfalls into the tidal estuary of the Tay. All gases generated in the sea outfalls have been disconnected from the town sewers. The sewage discharges by gravitation at all states of the tide, and, therefore, no storage is required. Street surface-water is admitted to the

sewers. The sewers are flushed with brook water. The Commissioners have expressed themselves well satisfied with the efficient working of the scheme, and with the fact that the actual cost has proved less than the estimate. The engineer to the works is Mr. W. H. Radford, C.E., of Nottingham, and the design was chosen in open competition. The contractors were Messrs. McKay & Son, of Broughty Ferry, near Dundee.

#### STAINED GLASS AND DECORATION.

**ST. PAUL'S CHURCH, WESTLEIGH.**—On the 29th ult. three stained glass windows were unveiled at St. Paul's Church, Westleigh. The windows, which are placed in the south-west wall of the church, have been executed by Messrs. Heaton, Butler, & Bayne, of London.

**NEW WINDOWS, ST. JAMES'S CHURCH, GLOSSOP.**—Two windows, in memory of the three brothers Wood, and Mr. John Wood, have just been placed in St. James's Church, Glossop. They have been executed by Mr. A. O. Hemming, of London, and represent the two apostles, St. James, the patron saint of the church, and St. John, and the two prophets, Samuel and Daniel, and the upper part of the windows are angels bearing scrolls.

#### FOREIGN AND COLONIAL.

**FRANCE.**—The Commune of Thiais has opened a subscription for a monument to soldiers who died in the Franco-German War and are buried in the cemetery of that town. The Municipality of Montpellier is to have a marble statue of Cabanel, to be executed by M. Antonin Mercié. The Town Council of Lyons has decided to offer to Besançon a plaster model of the figure of the Republic which surmounts the monument in the Place Carnot. The Conseil Général du Rhône has adopted a project for a railway line from Creix Rousses to St. Etienne. The Ministre des Travaux Publics intends to ask the Government for a vote for the formation of a new railway line between Dieppe and Havre. There is also talk of a new line between Beaune-la-Rolande and Etampes. This line, of a length of 400 kilometres, would pass by Fithiers. The Ministre de l'Instruction Publique has promised a subvention of 15,000 francs towards the Jeanne d'Arc Monument at Reims. M. Louis Cazal has arranged at Toulouse a competition in sculpture and painting to coincide with the opening of the Exhibition there on March 15, 1891. The competition is intended especially for artists belonging to the south of France who have received medals at the Salon. At the request of Municipality of Pau, M. Alphonse has promised his assistance in the works that are to be undertaken for the embellishment of that town. He will go to Pau next month, accompanied by M. Lafoucade, gardenier-in-chief to the City of Paris, who laid out the Champ de Mars for the great exhibition. At the commencement of next month the Colonial Museum at the Palais d'Industrie will be reopened. A certain number of former pupils of the Ecole des Beaux-Arts and of the Ecole Centrale des Arts et Manufactures, in concert with the architects of Limousin, have founded a local or rather regional society of Architects of Limousin, which will include the districts of Haute Vienne, La Creuse, and La Charente. The President will be M. Gay, Inspecteur des Edifices of the diocese of Limoges, supported by MM. Texier and Mallet, architects, at Limoges, who will act respectively as Secretary and Treasurer.

**BERLIN.**—The municipality have voted 1,800,000 marks for the construction of unloading quays on the Landwehr Canal, which passes through the city and over which most of the water traffic to the capital passes. Among the many hospital schemes now on hand, another for a so-called "Domestic Servants' Hospital" has now come to the foreground, the municipality having voted the cheap sale of a site of 7,000 square metres superficial area for the proposed building. A working-men's covered swimming-bath is to be erected here at a cost of 368,000 marks. From a corrected statement, just published, it appears that the total cost of the Berlin Metropolitan Railway, after allowing for land held and for disposal, amounts to 60,538,000 marks, of which 27,199,000 marks is for property acquired and 33,339,000 marks for cost of construction. The total length of the railway, with its east and west junctions, being 12.145 kilometres (7.4 miles), the expenditure has been at the rate of about 5,000,000 marks per kilometre, or nearly 400,000*l.* per mile.

**VENEZUELA.**—Some new railroad lines, having together a total length of 500 kilometres, the construction of which embraces some difficult pieces of civil engineering, are being carried out according to the designs, and under the supervision, of the German engineer, Carl Plock. Most of the materials required are being ordered in Germany, the rails from Krupp, the ribs of the metal viaducts from the "Friedrich-Wilhelm Kuefte," the rolling-stock from a firm in Duitz, &c.

**WARSAW.**—An international competition, apparently, as the advertisement of competition is in

German, Austrian, Swiss, and Russian papers, has been opened for the purpose of obtaining suitable designs for a large terminus building to the Vienna-Warsaw Railroad Line. A jury of nine members has been appointed; the first three premiums are 3,000, 2,000, and 1,000 rubels; three extra prizes 500 rubels each. The latest date for sending in designs is May 8, 20, 1891. Particulars can be obtained at the "Direction der Warschau-Wiener Bahn," Warsaw.

**BREMEN.**—The Municipality intends having a system of electric lighting laid, and after due consideration of several competition schemes, has decided to have the work done by Messrs. Siemens & Halske, of Berlin, whose tender amounted to 1,500,000 marks, or nearly 75,000*l.* The firm arranges its apparatus and lines for 25,000 incandescent lamps, besides the arc lights for street illumination.

**SPRATKOK.**—The military authorities have decided on erecting 1,350 dwellings for the families of workmen employed at the Royal Small Arms Factories. SIAM.—The proposed first Siamese railroad (Bangkok—Bang-Pa-In—Ajuthia—Saraburi—Korat; total length, 268 kilometres), which is to be carried out by a German Government engineer (Mr. E. Baurat), of Berlin, is now going to be taken in hand. In our previous contemporary, the *Centralblatt der Bauwesen*, the Siamese Government informs German contractors of its intention of asking for tenders for construction of this railroad a few months hence, and states that it might be advisable for would-be competitors to now inform themselves on the spot as to the nature of the work, the months December to February being suitable for such a trip of investigation. The notice mentions that, according to the present state of "the preliminary works," some 4,000,000 cubic metres of soil and 200,000 cubic metres of rock will have to be moved, and that some 55,000 cubic metres of brick and stone work, 8,000 cubic metres of wood will be required. The Bangkok-Ajuthia line will have to be in working order two years hence; the whole line within five years. We hear that the Siamese Government is trying to obtain the services of several young German engineers, and is offering salaries of from 600*l.* to 750*l.* per annum.

#### MISCELLANEOUS.

**NEW HARBOUR SCHEME, DOVER.**—In a Parliamentary notice which has been published, details are given of the scheme for the enlargement of Dover Harbour, which the Dover Harbour Board propose to carry out with the sanction of Parliament. Powers are to be bestowed for to enable the promoters to erect a new pier in continuation of the Admiralty Pier, extending eastwards for about 550 ft., and terminating in the sea. Also to construct another pier, to be called the East Pier, which will terminate in the sea about 640 ft. from the existing head of the Admiralty Pier. Provision is to be made in the Bill for the erection of sea-walls for the purpose of reclaiming a part of the foreshore and a portion of the bed of the sea lying between the Admiralty Pier and the existing South Pier. It is intended also to construct two short piers or jetties at this part, which will extend 425 ft., or thereabouts, in the sea. The cost is proposed to be covered by means of a poll-tax of 1*s.* a head on Continental traffic, realising the sum of 300,000*l.* when capitalised as a contract amount for the work to be executed.

**LONDON PROPERTIES FOR SALE.**—Two well-situated freehold properties are about to be put up for sale by auction at the Mart. On the 11th inst., by order of the Commissioners of Her Majesty's Works and Public Buildings, the premises lately occupied by the Inland Revenue Department, on Tower-hill, and extending through to Great Tower-street, to which the frontages are about 77 ft. and 37 ft. 6 in. respectively. The premises have carway entrances in both thoroughfares, extensive basement and cellars, and a large inner courtyard. They cover an area of nearly 10,000 sq. superficial, and rise in part to four floors in height. In course of February next, the premises being Nos. 423 and 424, Strand, with a frontage of 20 ft. there, now leased at 300*l.* a year, together with the return in Bedford-street, being Nos. 2 and 3, the Bedford Hotel, having a frontage of 122 ft., are now leased at 170*l.* per annum. The present leases will expire at Midsummer next. The total area amounts to 2,650 sq. superficial.

**ROYAL INSTITUTION.**—The following are included in the lecture arrangements before Easter:—Professor Dewar, six Christmas Lectures to Juveniles, on "Frost and Fire;" Professor G. Maymoet-Poly, three lectures on "Modern Chemistry in relation to Sanitation;" Mr. W. Martin Conway, three lectures on "Pre-Greek Schools of Art;" the Right Hon. Lord Rayleigh, six lectures on "The Forces of Cohesion." The Friday evening meetings will begin on January 23, when a discourse will be given by the Right Hon. Lord Rayleigh on "Some Applications of Photography;" succeeding discourses will probably be given by the Right Hon. Lord Justice Sir Edward Fry, Professor J. W. Judd, Professor A. Schuster, Dr. E. E. Klein, Mr. Percy Fitzgerald, Dr. J. A. Fleming, Dr. Felix Semon, Professor W. E. Ayrton, and other gentlemen.



## COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITION.

Nature of Work.	By whom Advertised.	Premium.	Designs to be delivered.
*New Court House, Peel.	Isle of Man Govt.	200	Jan. 15

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Dwelling houses, Grange street.	Glasgow Imp't. Trust	Official	Dec. 9
Supply of Rails.	Isle of Man Govt.	do.	do.
Steel Rails, Bolters, Wrought-iron Work.	Bombay, Barots, and	do.	do.
Bolts, &c.	Cont. India Ry. Co.	do.	do.
*Roadmaking Works.	Lewisham Bd. of Wks	do.	do.
Cast-iron Gas and Water Pipes.	N. E. Ry. Co.	do.	do.
Pipe Sewer Settling Tanks, &c.	Walsfield R.S.A.	Frank Masie	do.
Two Semi-detached Houses, Southwark.	Arthur Shosmith	do.	do.
Yorks.	Newton, Chambers, &	do.	do.
Six Pairs of Cottages, near Rockingham	Co. Ltd.	do.	do.
Colliery, near Barnsley.	Willens Local Board	do.	do.
*Machinery and Laying Roads.	Southampton Corp.	W. G. B. Bennett	do.
*Supply of Broken Granite.	Marble's Local Bd.	do.	do.
*Drain Pipes, Bricks, Cement, &c.	Crown Estate Paving	do.	do.
*Removal of Dust, Dirt, Ashes, &c.	Strait to Manchester	do.	do.
Street and Passage Improvement.	Local Board	Mr. Royle	do.
Detached House, New Leeds.	R. E. Ward	do.	do.
Two New Streets, Bangor, Ireland.	John Russell	do.	do.
Supply of Timber.	Newcastle-on-Tyne Corp.	do.	do.
Granite or Whitestone Mosaic.	Wakefield Corporation	Richd. Fytche	Dec. 11
*Works, Repairs, &c. to station Buildings (three years).	G. E. R. Co.	Jno. Wilson	Dec. 12
Pair of Semi-detached Villas, Wetherill, Carlisle.	N. S. Hawks	T. Taylor Scott	do.
River Wall, Ebbw Vale, South side of	Glasgow Town Council	A. B. McDonald	Dec. 13
River Clyde.	N. B. Buckle & Co.	H. P. Buckle & Co.	do.
Road Metal.	Parish of St. George, Hanover-square	G. Livingstone	do.
*Works and Materials.	A. & W. Reid	do.	do.
Alterations to Property, High-street, Forres, N.B.	Wm. Bu. k.	do.	do.
Alterations, &c. to Jan. 'Alfordshire, Lox-	W. H. Lyson	do.	Dec. 15
wood, Buxton.			
Extension of Harbour Office.	Belfast Harbour Com.		

Those marked with an Asterisk (\*) are advertised in this Number. Competition, p. iv. Contracts, pp. iv. and vi. Public Appointments, p. xviii.

## CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Alterations, &c. to Manse and Offices, Boharra, Keith, N.B.	The Haritors	Mr. Robertson	Dec. 15
*Slop Waggon.	St. Mary (Elington) Vestry	Official	do.
*Brick Sewer.	Kennington Vestry	do.	Dec. 16
New Streets, Sewing, Kensing.	do.	W. Sagen & Son	do.
Builders Materials, &c.	South Metropolitan Dist. of Melton	Official	do.
*New Head Post office at Leeds.	Com. of H.M. Wks. & Grange, Durham	do.	Dec. 17
Iron and Steel Castings, &c. Trundon	W. Scott	do.	do.
*New Works at Heath	N. B. R. Co.	W. Bell	do.
*Ditto (Ironfounders' Work).	do.	do.	do.
*Heating Apparatus.	Essex County Council	Official	Dec. 18
*Re-construction of Landry, Eddell street	The Commissioners	J. Waldram	do.
*Artisan's Dwelling, Swansea.	The Directors	E. Hall	Dec. 20
Police Station, Solihull	Corwall C. C.	H. J. Gould	do.
Temperance Hall, Restaurant, Offices, &c. Coleraine, Ireland	Young & Mackenzie	do.	Dec. 30
Storage Reservoir.	Chas. Gott	do.	Jan. 1
*New Entrance to Tyne Dock	N. E. R. Co.	J. W. Barry	Jan. 14
Constructing Breakwater, Glasgow	H. W. Lewis	do.	No date
Excavators Work, St. Dunas Church, near Cowbridge, Glam.	Keppson & Fowler	do.	do.
Oral Drain (300 yds.), Galeshead	Althausen's High Works	do.	do.
Timber, Roadwork, &c. Newcastle	Stokers & Leys	do.	do.
High House, Leeds	Ellison Bros.	do.	do.
Ironwork, Brass Fittings, &c.	Birmingham Corp.	Official	do.
Excavators Work	T. & W. Smith	do.	do.
Well-sinking, Penbury, Carmarthen	Elliot's Metal Co. Ltd.	do.	do.

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Building Inspector	Honour. Secy. for London School Bd. for London	32 3s.	Dec. 8
*Chief of Works for Repairs	do.	150l.	Dec. 12
*Teachers	do.	100l. and 140l.	Dec. 16
*Clerk, Surveyor, and Collector	Carnarvon Harb. Trust	151l.	Dec. 17
*Surveyors	Worthing Town C.	100l.	Dec. 22
*Two Senior Draughtsmen	Inspector-General of Fortifications	21 10s weekly	No date

A TALL TOWER FOR BLACKPOOL.—It is stated that arrangements have just been completed at Blackpool for the erection of a tall tower. The block of buildings comprising the Aquarium and the Beach Hotel, in the centre of the Promenade, has been purchased for 60,000l., and a company for the erection of the tower will shortly be floated, with a capital of 150,000l. The tower, as already projected, will be about 500 ft. high, and will include six platforms, with large halls for entertainments and other purposes.

SANITARY INSPECTOR FOR PERTHSHIRE.—At a meeting of the Finance Committee of the Perthshire County Council on the 28th ult., Mr. George McKay, Sanitary Inspector, Girvan, was appointed by a large majority Sanitary Inspector for the county of Perth, at a salary of 300l. per annum, with expenses.

SANITARY APPOINTMENT AT BIRMINGHAM.—On the 28th ult. the Health Committee appointed Mr. William Holt, of Rochdale, Superintendent of the Interception Department. Mr. Holt was manager to the Rochdale Sanitary Works, and was previously manager of a large engineering works at Rochdale, and constructed for that Corporation the machinery for dealing with the night soil of the borough. There were 196 candidates for the position. The amount voted to the post by the Council is 350l. per annum. Mr. Wilkinson, who held the office of superintendent, was receiving 400l.

LIVERPOOL ENGINEERING SOCIETY.—The third ordinary meeting of this Society for the present Session was held at the Royal Institution, Colquhoun-street, on the 26th ult., Mr. Ferdinand Hadleston, Assoc. M.Inst. C.E., President, in the chair. After the election of several new members, a paper was read by Mr. G. L. Addenbrooke, M.Inst. C.E., of London, entitled "The Distribution of Electricity from Central Stations." Mr. Addenbrooke first dealt with the conditions required for the proper working of incandescent lamps and the laws which regulate the flow of the current in the mains, and then passed on to a consideration of the difficulties which arise, first, from loss of energy in the conductors, and secondly from difference in pressure in conductors, and of the manner in which these difficulties are surmounted. He then described in turn the use and arrangement of feeders, the three-wire system, the use of accumulators in central stations, the alternating system, and the construction and use of converters. He also gave a description of the mains on the low and high pressure systems, of arc lamps, and of meters, and concluded his paper, which was illustrated by experiments and diagrams, with some general remarks upon the whole subject. The paper was listened to with great interest by a large number of members, and upon its conclusion an animated discussion took place upon various points, principally upon the merits of the two systems, high tension and low tension. A vote of thanks to Mr. Addenbrooke terminated the proceedings.

BUSINESS CHANGES.—We have received a notification that the partnership heretofore subsisting between Mr. William Hayward and Mr. William Eckstein, carrying on business at Nos. 187, 189, 191, and 193, Union-street, in the borough of

Southwark, under the style or firm of Hayward Brothers & Eckstein, has been dissolved by mutual consent, and as from June 30, 1889. All debts due to and owing by the late firm will be received and paid by Mr. Eckstein. Messrs. Lawford & Sons, of College and Devonshire Wharves, Great College-street, Camden Town, inform us that they have taken over, as from the 1st inst., as a branch concern, the old-established business carried on at Cowley Wharf, Hoxton, by the late Mr. Thomas Capon.

SOCIETY OF BIBLICAL ARCHEOLOGY.—The anniversary meeting of this Society will be held at 9, Conduit-street, Hanover-square, W., on Tuesday, January 13, 1891, at 8 p.m., when the Council and officers of the Society will be elected, and the usual business of the anniversary meeting transacted.

THE INSTITUTION OF ELECTRICAL ENGINEERS.—The annual general meeting of this Institution will be held at the Institution of Civil Engineers, 25, Great George-street, Westminster, on Thursday next, December 11, at 8 o'clock in the evening, for the reception of the annual report of the Council, and for the election of Council and officers for the year 1891.

TURIN EXHIBITION.—The international jury assessing the exhibits of Division IV. of the Turin Exhibition have awarded sixteen diplomas, three gold, and six silver medals, and have also given fourteen honourable mentions, and twenty-three ordinary commendations. Of the sixteen diplomas seven have fallen to municipalities in Germany (Berlin, Halle a. S., Hamburg, Leipzig, Magdeburg, Munich, and Worms); three to municipalities in Austria (Krakau, Trieste, Vienna); two to government departments, and two to municipalities in Italy (board of health, prison authorities,—Milan, Turin); one to Russia (Warsaw), and one to England (London). The three gold medals fell to municipalities in Italy (Bologna, Ferrara, Spezia).

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers, held at the Town Hall, Westminster, on Monday evening last, Mr. Henry Adams, President, in the chair, a paper was read by Mr. J. J. F. Andrews, M.A., "On Ship Caissons for Dock Basins and Dry Docks." The author prefaced his paper by a general review of ship caissons generally in use for dock basins and dry docks, and pointed out the progress of caisson construction from the early caissons closing entrances of from 40 to 50 ft. openings, and 20 ft. of water over all, to those now in use in some of Her Majesty's and other dockyards, closing entrances of from 90 to 195 ft., and having water over the sill of some 35 to 38 ft., and a depth from sill to coping of 40 to 45 ft. He then reviewed the improvements and alterations in design as to construction, method of working, and the caisson floating with the bottom buoyancy, and sinking by water admitted to the bottom or interior of the caisson (the water so admitted being pumped out or run into the dock when raising), to the caissons with watertight decks, forming an air-chamber, and having a top tank to contain water for sinking. He then reviewed the question of stability under different conditions of construction, as to quantity of ballast required for safe working, and the conditions of flotation, as regards position of metacentre centre of gravity, and centre of buoy-

ancy of flotation, and stated generally that for a caisson floating with bottom buoyancy the common centre of gravity of caisson, ballast, and all the weights should be at same determinate distance below the metacentre, and, with the caisson floating with air-chamber, the common centre of gravity of caisson, ballast, and all the weights should be from between 1 ft. to 2 ft. below the centre of flotation of air-chamber, and all the parts immersed; and he then gave as a general approximate rule for the height or position of the metacentre, above the centre of buoyancy at which the caisson is floating, as  $B^3 \times .08$ , where  $B$  = breadth of caisson at which it floats,  $d$  = draft of water; this formula being for the ship alone only. The author explained the relative values of six different types of caissons, as to design, construction, method of working, stability of flotation, use, &c.

THE ENGLISH IRON TRADE.—The English iron market continues very quiet, with no prospect of an improvement this side of the New Year. Pig-iron has been dull during the past week. The Glasgow and other warrant markets have been flat, and prices of pig-iron generally have shown a downward tendency. Middlebrough pig has been quoted from 1s. to 2s. a ton lower, with little business doing, however, even at the lower figure (43s. 6d.). Manufactured iron is equally depressed, and concessions can be obtained for good orders. Welsh bars have been reduced 5s. a ton. The demand for steel is better, comparatively, than for finished iron, but weakness characterises the market. Ship-builders and engineers keep well employed.—Iron.

ELECTRIC LIGHTING.—We understand that Messrs. Dickinson & Co., of Hanway-street, have secured from Mr. Norman Forbes a contract to install the electric light throughout the Globe Theatre.

## MEETINGS.

SATURDAY, DECEMBER 6.

The Association of Public Sanitary Inspectors of Great Britain.—Mr. J. C. Swinburne Hanham on "Cremation as a Mode of Disposing of Our Dead." 6 p.m.

MONDAY, DECEMBER 8.

Surveyors' Institution.—Adjourned Discussion on Mr. T. A. Dickson's paper on "The Labour Question as regards Agriculture." 8 p.m.  
Society of Arts (Lancaster Lectures).—Professor Vivian B. Leves on "Gaseous Illuminants." III. 8 p.m.  
Leeds and Yorkshire Architectural Society.—Mr. F. Clibborn on "Normandy." 7.30 p.m.

TUESDAY, DECEMBER 9.

Institution of Civil Engineers.—Mr. E. W. Stoncy, M.E., on "The new Chittravati Bridge, Madras Railway." 8 p.m.

WEDNESDAY, DECEMBER 10.

Society of Arts.—Mr. F. Bailey on "Electric Lighting Progress." 8 p.m.  
Society of Engineers.—Annual Dinner, Holborn Restaurant. 6 p.m.  
St. Paul's Ecclesiastical Society.—Objects of Ecclesiastical interest to be exhibited and described. 7.30 p.m.



\* public-house, Hornsey-rise, for Mr. T. Lealbetter. Messrs. G. & Son, architects :  
W. Lavender, Morten-street, Hornsey-road\* .... £115 0 0  
\* Accepted.



*Particulars on Application, Chief Offices:—Fitzroy Works, EUSTON ROAD, LONDON, N.W.*



# The Builder.

Vol. LIX. No. 2497.

SATURDAY, DEC. 13, 1896.

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Salcombe Church, Devon.—Mr. J. D. Sedding, Architect .....	Single-Page Ink-Photo.
Brasses at Lingfield, Surrey, and Seal, Kent.—From Rubbings by Mr. Andrew Oliver, A.R.I.B.A. ....	Double-Page Photo-Litho.
Wandsworth Free Library: New Reading Room.—Messrs. Roger Smith & Gale, Architects .....	Single-Page Photo-Litho.
Entrance-Lodge at Otford.—Messrs. Roger Smith & Gale, Architects .....	Single-Page Photo-Litho.

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## Fortification.



AMONGST the able men who at the present time aid with their experience, their counsel, and their advice our Inspector-General of Fortifications, and through him our Secretary of State

for War, and through the Secretary of State for War the Ministry of the day, is to be found the author of the work on "Fortification" from which the foregoing extract has been made, and it reflects in a measure not inconsiderable the tone which pervades the whole work, which is a work of great power, of great research, of careful balance between advantages and disadvantages, and is wholly distinct in style to any other work on this subject with which we are acquainted. But more than this, it has been presented to the public at a most appropriate period—a period of profound peace, when matters of this kind can be calmly weighed and criticised, and the difference between right and wrong is more likely to be correctly determined than can ever be the case in the time of feverish excitement and semi-panic to which civilised nations are generally prone when war seems imminent.

It is the due selection of the materials of which these fortifications should be made which influences the expense which has to be incurred, and the first item of national fortification is men. We will, however, assume, and not enter into any argument on such a point, that our nation has a sufficiently numerous population, and we hope (not perhaps with absolute confidence) that the organisation of that population for war justifies the idea that a sufficient proportion of men, *i.e.*, trained men, would be able to turn out and take their share in the fortification of the country whenever its integrity is menaced and its existence threatened.

It is from a point of view almost as broad as that above indicated that Major G. S. Clarke, of the Royal Engineers, treats the subject of fortification. He commences his work by giving a *résumé* of such comparatively recent sieges and other operations of modern war as bear on the question of what is best to be done at the present time. He then measures the respective influences on design which ought to be the natural consequence of improvements in modern weapons of offence. The general requirements of modern fortification naturally follow on the consideration of modern weapons. He next shows how futile it is to presume that any conclusions of the slightest value about coast defence can be arrived at without a thorough study of the naval architecture and general arrangements of the war-ships of possible enemies; and, acting on that view, his work contains, in a form of condensation which is remarkably effective, and in a style which is simplicity itself and suited to the most unprofessional comprehension, a complete account of the powers for offence and defence possessed by the war-ships of France, Russia, and Italy, as well as those of our own country, when engaged with coast defences.

It may seem at first sight that such apparently naval and military questions do not concern our readers, that the consideration of the almost infinite amount of detail connected

with them is beyond the ordinary scope of people engaged in peaceful pursuits, but if we bear also in our minds the very large national expenditure which is annually incurred on works of construction and of maintenance for what are ordinarily termed fortifications, and the large amount of work which has been, is, and will have to be done by the engineers and the builders of this country in connexion with these fortifications, it seems probable that a few hours expended on the perusal of Major Clarke's work will be hours well spent, and that the perusal may improve the understanding and expand the mind.

The object of fortification is the economy of life; it should assist a small body of men to defeat a more numerous body, and, consequently, in the days of hand-to-hand combat, the men of war who could afford it covered their own bodies with metal, and the success of a battle depended much on the number of mail-clad warriors that could be brought into the field. So do we fortify our wood with paint, and sometimes our walls with tiles, &c., to defeat the elements of destruction.

The materials of which fortifications are composed may be briefly divided into earth, stone, and iron, the progression of cost being very much in the order named, and, consequently, the object of the engineers of the State, who want to produce the greatest benefit at the smallest cost, must be to utilise the first-named as much as is justified by the end to be obtained. They have to consider the relative power of materials to resist the projectiles which are hurled at them, and exercise their judgment accordingly, so that they afford due protection to the men they are intended to shelter, and (in some cases) to the weapons those men are to use. Major Clarke has laid very great stress in his work on this very point of the *exercise of judgment*, and has produced data to show into what extravagance people may be led by a false estimate of the probabilities of destruction by the projectiles from weapons of offence. It is well to be thoroughly *au fait* as to the practices and theories of our neighbours in these matters of fortification; but we must be careful not to assent too readily to the soundness of Continental decisions, whether they be German, Belgian, French, Italian, or American. For instance, in the course of

\* "Fortification, its past achievements, recent development, and future progress." By Major G. Sydenham Clarke, C.M.G., Royal Engineer. London: John Murray, Albemarle-street.

this work, the author has taken the opportunity of exposing the fallacies of some of the conclusions at which a Belgian engineer of renown, General Brialmont, has arrived in the matter of what are called cupolas, or land turrets. Some of these are made to disappear after the gun or guns which they enclose have been fired, and some are not; whilst others there are, designed by a M. Mongin, which oscillate into and out of the firing position. The author weighs with perfect fairness the merits and demerits of this form of fortification, and, referring to a turret which has been provided for Bucharest on the recommendation of General Brialmont, of a similar description to those which had at one time been contemplated to be used for the defences of certain parts of this empire, he says:—

"The cost of the turret at Bucharest was about 10,000*l.*, and for this sum about six movable over-bank guns of greater power could be provided. Unless siegework is to be regarded in the light of a mere duel on the backwoods principle between guns in fixed positions, all tactical handling of the defence being put out of sight, it may well be doubted whether a movable armament of equivalent cost would not be infinitely more effective from the defender's point of view. The great advantage possessed by the attack in all ages has been the employment of a mobile artillery against armaments cribbed, cabined, and confined by fortifications. Is it necessary to perpetuate this advantage? . . . The disappearing cupola is a creditable manufacturer's production. Two or three men buried in a subterranean chamber lighted by a lantern are at the right moment to raise their cupola and deliver an overwhelming fire in the right direction. The mechanical principles are apparently sound: the arrangement will probably work so long as it is not hit by anything heavier than a rifle bullet. The price is satisfactory—to the makers—and purely military considerations are of small account. . . . General Brialmont practically contents himself with sprinkling cupolas over his plans, and retains all the objectionable features of the stereotyped fort. In his view the advance in the power of weapons merely calls for increased protection. He accepts with effusion the designs of the ironmasters, and superimposes them upon all the tricks of drawing-office fortification in its most aggravated form. The new ironmongery is, in fact, to be an addition to old methods, and cannot be trusted sufficiently to form the basis of a new system."

Before quitting the subject of these cupolas, we are constrained to depart here from our intention of excluding from the review of this work any special reference to purely military details, but the somewhat pungent and very scornful manner in which the author finally disposes of these cupolas is too good to be omitted:—

"Given a dead, level, featureless plain, and an enemy who will attack in broad daylight on a given line of a given breadth, a plan of action may be conceived. The ground over which the attack is to take place might be divided up among the different cupolas. . . . At the sound of the bugle the disappearing cupolas rear their heads, and the whole collection of pepper-pot lids twist themselves into position, and come into blind action till the 'cease fire' is sounded. With a well-exercised garrison, this would perhaps be practicable, although, in the excitement of the action, many of the combatants would lose their nerve, forget their *chankles*, and fire far over their enemy's heads. Men who would distinguish themselves for bravery if their comrades were within sight, would unquestionably disappoint expectation if thus buried alive in dispersed iron boxes completely hidden from their officer's eye. The assumptions above made are, however, precisely those which could not occur, and it requires very little imagination to picture the wild confusion which an attack in the grey dawn would create in defences of this nature applied to ordinary topographical conditions. No one would know what was happening, or from what side the danger was coming. There would be no command, no unity of purpose. The cupolas would raise themselves prematurely and disappear when their fire was most needed. The combat would be more unequal than that between good modern cavalry and the ironclad knights of the Middle Ages, who would be ridden through and through and rolled over like so many helpless nineties. M. Mongin's typical fort is practically a mastless turret ship buried up to the deck-level in the ground, and manned by mechanics. Difficulties and inconveniences of all kinds have to be accepted when a fort is made to steam across the seas, but to gratuitously adopt them in an extremely aggravated form on land appears to be madness. Machinery can aid fortification, but only within limits. Tactical principles and human nature are practically the same

in all ages, and in them alone can a solid basis be found for systems of fortification."

The only example which we have in this country of a work corresponding in any way to those of the above-named nature, is the turret at the end of Dover Pier, in which a pair of eighty-ton guns are mounted. It cost an immense sum of money, and the author considers that the possibility of its jamming when struck has, perhaps, not yet been fully realised. The advantages which he admits that it possesses are (1) complete protection, limited only by thickness of armour and size of port; (2) a relatively small target; (3) all-round fire; (4) two guns combined in one protection; (5) overhead protection given against splinters and shrapnel; (6) the curvature is unfavourable to penetration; (7) the conning tower affords a wide field of view for aiming purposes; and (8) the system has been proved to work satisfactorily on board ship. But he does not approve of the position in which it is placed,—no need to have *gone out to sea*,—and evidently seems to think that the object to be attained there might have been equally well or better effected at a smaller cost. It is easy to write in this light and airy way, but we fail to see how any blame or charge of error of judgment can be attached to those who decided to place this turret at the end of Dover Pier, whether the object could or could not be more cheaply effected now. The decision must have been arrived at most unquestionably after the fullest consideration by every one concerned, both statesmen and soldiers, though probably the experts amongst the artillerymen and engineers had most to say in the matter. But the decision must have been made by the light of the knowledge which they actually possessed, and it is evident that it is as impracticable to foresee all the changes which scientific inventions may make in the details of our fortifications, as it is in the details of weapons of offence, or of the ships which carry them. The position is very parallel to that of the manufacturer who sets up a plant of machinery at great cost, but finds that after a time it repays him to substitute for it a new plant, constructed on still more scientific principles. The shipowners and many other people are in the same situation, and the struggle for the survival of the fittest becomes more and more accentuated as the scientific knowledge of man increases.

The Dover turret belongs, however, to the class of works known as coast defences, and is for a totally different purpose to the cupolas above-mentioned, which are proposed to occupy certain parts of "permanent" land fortifications not exposed to fire from heavy guns in ships. Our Parliament rarely declines to grant the funds which are represented as necessary for the defence of the country, as soon as it is satisfied that those funds are needed; but the cost of iron and steel fortifications, as distinguished from those made of other materials, is so very great that it must be a source of the most sincere satisfaction to every patriotic person if our military engineers can convince us that they may be to a great extent, and perhaps entirely, dispensed with. That is apparently the view with which they now regard such materials, for not only the author of the work now under review, but another military engineer engaged in our War Office, who has produced, at the same time as Major Clarke, a work on fortifications,\* says, speaking of cupolas and turrets, that—

"There is no likelihood of their being introduced into the English service. I believe it to be a mistake to put so much money as this system requires into passive protection, which is always liable to be overpowered by a new weapon. It would be better to expend the sum in developing the offensive strength of the place by increasing the number, power and mobility of the armament."

There is another kind of cupola of a much lighter nature, which is assuming a certain amount of prominence, as it was tried at the

\* "Permanent Fortifications for English Engineers," By Major J. F. Lewis, R.E.

German Military Manœuvres last year. The author not only alludes to this and gives an illustration of it, but seems to consider that with certain modifications it might find useful employment in advanced defences of "field" type. These "field" cupolas, the invention of Colonel Schumann, who died last year, are intended each to hold one quick firing gun of 1½ in. bore, protected by a cylindrical case of 1 in. steel with a domed top, the platform and cover being pivoted, so that the gunner who garrisons it can revolve himself, gun, and cover, and, seated on a saddle, can fire ad libitum at the rate of forty rounds per minute if necessary. There is room inside for another man to hand up the ammunition. They are proof against bullets and splinters, and as their weight is only 28 cwt. they can be transported without difficulty on a truck drawn by two horses. They have been used experimentally as stated, but it is very problematical whether they will ever take a permanent place in the material of campaign, as this use of portable iron fortifications seems to bear too close a resemblance to the plate-armour, iron helmets, visors, and similar antique contrivances of the Middle Ages. They could be planted in prepared positions, but could not follow in advance or be withdrawn in retreat. At General Brialmont's recommendation, the Roumanians have been supplied with a good many of these as well as of the larger kind, but our experts do not seem to consider it wise to follow such a lead, and there seem to be good reasons for concluding that guns of the same calibre as those which are held by these cupolas would, if mounted on "disappearing" carriages, be more effective, more portable, and less costly. Consequently, they ought to stand condemned, without hope of mercy; and we have advisedly devoted some space to this branch of the subject, in order to demonstrate that the operations of war cannot be controlled by mechanical genius to the extent that mechanicians would like us to believe.

The historical portion of this work is full of interest, devoted as it is to the examination of the influence which fortification has had on war generally, and on the prolongation by its means of the existence of armies and the retention of important places. They are usually subdivided, at all events by the schoolmen (as the author terms them), into what are called "field," i.e., improvised, and "permanent fortification." Of the former we have laid before us with admirable clearness the cases of Silistria, Kars, and Sebastopol in 1854-5, Petersburg in 1864, and Plevna in 1877. It will be remembered that on the arrival of the English and French allied armies on the south side of Sebastopol after the battle of the Alma, it was a fact that the works of defence of the town on that side were next to nothing; but that as time went on they grew, until at the time of its fall, after holding out for 349 days, the Russians had actually nearly a thousand guns in first line, opposed to about 800 guns of the Allies. The Malakoff Tower, a two-storied casemated building, with five guns only on each tier, was the only completed permanent work of fortification: all the rest were earthworks thrown up by the Russians during the siege, and the argument held and the conclusions deduced from this lesson by the author and those who agree with him, is that these improvised and comparatively slight works (so far as regards their sections) held the Allies at bay, and kept them from destroying the great dockyard quite as long as would have been the case with more permanent and originally expensive works, with "vast ditches, monumental revetments, clever drawbridges, fantastic traces, exaggerated flank defences, and all the luxuries of engineering fancy."

He at the same time admits that national arsenals should not be left without defences of some sort; and, admitting that, he lays at our feet, fully exposed to view, the crux of the whole matter; for Todleben, the great Russian engineer, distinctly states that, in consequence of having to throw up these



works during the period of the siege the loss of life in constructing them was enormous.

At Petersburg, at Plevna, and elsewhere the author shows that fortifications composed almost entirely of earth have achieved marked successes, and must always command deep respect, if the men behind them know their work; but he very pithily adds that, "You cannot make an indifferent and badly-handled force safe with all your money and art." Armaments are, in fact, useless without men, and men of little use without training.

The author demonstrates that the adoption of the magazine rifle has indisputably caused quite a revolution in many of the details of land fortifications, in their plans, their sections, and the specifications of their materials; that it has also tended to bring into greater prominence the increased value of the least expensive material of which such works can be made, *i.e.*, earth. He pleads, therefore, for a revolution in the teaching of the science of fortification, that students shall be clearly, — more clearly than is the case now, — have impressed upon them that the old systems such as those of Vauban, &c., were systems suited, and probably well suited to the military tactics of their particular period, but that they are not in any way suited to the tactics of the present day, and that until this is done there can be no hope of sound progress, or "of reaching a fair general consensus of matured opinion." "Fort building," he very justly remarks, "is not fortification, and lavish expenditure upon non-essentials can never atone for the absence of real preparation for war. The very elaboration and cost of the conventional defences have tended to induce neglect of real requirements, and to foster the dangerous belief that any troops, commanded in any fashion, will suffice as garrisons."

In the spring of last year a very valuable debate was raised at the United Service Institution in Whitehall by Admiral Colomb, who tried, with some eloquence, to induce the Government of the day to allocate for naval purposes all the funds they could spare from those voted for national defence, and grant little or nothing for that branch known as fortifications. The debate, carried on by statesmen and several of the most clear-headed men in the army and navy, was, as we have said, valuable, in fact, invaluable, for it had an effect which, perhaps, the originator had not contemplated, that of proving most conclusively the criminal folly of neglecting the latter for the sake of the former. Whether Major Clarke's work is intended for the further instruction of this misguided but somewhat influential Admiral we know not, but the evidence he produces in his book of the inutility of modern ships of war to make even a decent fight with fairly well-made and properly-armed coast fortifications is absolutely crushing. We must refer the reader to the work now under review, which is pleasant, light reading, and not burdened with technicalities or elaborate details, for the analysis of the case, for the exposition of the weak points of the war vessels (which are admirably illustrated), and for the description of the class of works now approved for coast defences.

We are not concerned, from our point of immediate interest, to know how long it would take these ships to sink or capture each other, but, judging from the arguments which have been adduced by Major Clarke and others, there seems little reason to doubt that they are capable of performing those operations with considerable celerity. As, however, the question whether an enemy's ships of war would, or would not, be able to ensure some measure of success in fighting coast fortifications is a matter of enormous importance from our point of view, *i.e.*, the nature of the works which should be made to resist them, we cannot do better than give the author's own words to support the definition which we have given of fortifications, *viz.*, that its object is the economy of life. With this object the war-ships are made, so that by smashing their opponents they may save themselves, and the lives and property of their

countrymen, and, in confining their work to the high seas, the combat may be assumed to be on fair and equal terms. But, in engaging coast batteries this fairness of combat disappears, and whilst many of the so-called armour-clad ships are so designed that what are called their "vitals," *i.e.*, their guns and engines, are fairly protected, their crews are so exposed in the other very vulnerable parts of the ships, which almost always bear a large proportion to the protected parts, that "the coast battery will not concern itself with their armour, and will employ common shell, which would quickly convert them into slaughter-houses; except for a great and definite purpose, it would be criminal to pit such vessels against moderately-armed coast defences. It is not essential to sink a vessel or disable her engines. To cause a heavy loss in personnel would amply suffice for the purposes of coast defences, and the position of a modern ship at a long distance from her base, with her unarmoured portions riddled and half her crew *hors de combat* would be eminently precarious. From this point of view, the armoured belt will be of little service to the ship in action with coast defences, but, by keeping her afloat, may lead to her capture by an inferior vessel." Which is cold comfort for the men of the sea, but reassuring for the defenders of our shores.

The author's observations about the Zolinski gun, a pneumatic tube which will in future be employed in warfare, will give them colder comfort still, if they expose themselves to this new implement of destruction, which costs very little to mount in suitable positions, and will add very potently to the means for protecting coasts, harbours, &c.: a weapon which has been described by Lord Wolsley as "most probably destined to influence, if not revolutionise, warfare in future, both on land and sea."

The author considers that one 6 in. breech-loading rifled gun, well mounted and handled, should be capable of disposing of any ordinary war cruiser by destroying her crew, and the mode of mounting he seems to prefer is that on a disappearing hydro-pneumatic carriage, firing over a wall of concrete, acting as a revetment to earth, the whole gun emplacement being rendered as invisible as possible by avoiding contrasts with the neighbouring ground. One gun of this kind, with its mountings, costs about 2,700*l.*, and it is worthy of note that 200 rounds of ammunition costs about the same as the gun; whilst the emplacement to put it in and the foundation on which it stands, would not cost more than from 200*l.* to 300*l.* We, consequently, recognise two things at the same time, *viz.*, that land and coast fortifications cost at the present day an insignificant sum compared to the cost of the armament, whether of guns or of men, which they help to protect, and that the work of the navy progresses in importance for such work in contradistinction to the work of the builder, whether in stone or iron. For the national pocket this is highly satisfactory, though by the individual builder it might, perhaps, be viewed in a different light.


The aspirations of the Fortification Department of our War Office evidently point to the probability of their being able, with good organisation and previously-prepared details of all kinds, to throw up, if necessary, in the course of a few days, for the defence of the Metropolis and other strategic points in the United Kingdom such works of fortification as will enable our people, if properly armed and trained, to successfully resist a foreign army, if by any fatality it set foot on the wrong side of the "silver streak," and that the ignominious surrender of everything that makes life precious to our people, shall not, as has been predicted by some weak-kneed people, be the inevitable result of invasion.

"There is an old French saying that 'Nothing is sacred to the sapper,' and the author of this work is evidently prepared to justify this to the fullest extent, for he spares no one whose views differ from his own. If he is wrong in those views he will soon be shown the error of his ways by those he takes

to task, but as we feel well satisfied that the joints in his harness are few and far between, and that, in the publication of this work, he has performed an act of very considerable public importance, one which will help to prevent the waste of money, and ensure even better fortifications in the future than we have had in the past, he will probably be able to sustain without distress the charge of want of sacredness.

But in the work which we have had the pleasure of perusing, there flows a current of statesmanship underlying the stream of engineering, which attracts to an extent which fascinates the mind and brings conviction to the reader that the words he reads are those of truth and great soundness of judgment. We can do no more than to recommend every one who desires to understand the conditions under which his labour is protected to read and mark the contents of this valuable work.

#### THE CINCINNATI BRIDGE.

 N Volume XXIII of the American Society of Civil Engineers' Transactions will be found a valuable and interesting paper by Mr. William H. Burr, M. Am. Soc. C. E., on the bridge recently constructed over the Ohio river at Cincinnati.

The structure, with its approaches, forms a part of the Chesapeake and Ohio Railway system, and is a good example of modern American practice in bridge-building.

The bridge consists of three large spans, the central one being 550 ft. long, between the centre of the piers, and the side spans each 490 ft. between centre of piers. At either end of these large spans is a viaduct approach, which extends for 1,533 ft. on one side and 2,300 ft. on the other, but does not call for any special notice. The whole structure is designed not only for a double line of railway, but also for two roadways and two side walks, for the ordinary vehicular and pedestrian traffic.

The simple non-continuous truss over the middle opening is the largest one yet constructed. All the main parts of the trusses are of steel, but no specific process of manufacture was insisted upon, provided the material stood the tests specified; consequently we find both Bessemer and open-hearth steel largely used in the work. The lateral and transverse systems of bracing and the floor beams and stringers are of wrought-iron.

The weight of iron and steel in the two 490-ft. and one 550-ft. span is 5,000 tons, and an additional 6,180 tons was required for the construction of the viaduct approaches.

The specifications under which this work was executed were drawn up by the Phoenix Bridge Company, by whom the entire work of these spans was designed, constructed, and erected. The type of truss adopted is that generally proposed by the Phoenix Bridge Company for large spans. It will be noticed, that the single system of web members is used, and consequently the stresses are well defined.

The work of the construction of these spans was commenced in the shops in March, 1888, and in June, as soon as the state of the river would permit, staging was begun for one of the 490-ft. spans, and the whole span was erected by August, although it had a very narrow escape at one time of being carried down the river by a flood during the early part of July. This flood caused a rise in the river of about 25 ft., and great quantities of drift were brought down by the current and lodged against the stage, which was then carrying a large traveller, and about two-thirds of the trusses and railway floor. The pressure was so great that it pushed the stage about 1 ft. down stream, but did no other damage.

The erection of the 550-ft. span was commenced in August, and towards the end of the month another flood, which rose some 27 ft., brought down the river such quantities of drift that it swept the stage for this span,





as well as some 350 tons of the truss which was then upon it, down the river, notwithstanding extensive temporary protection which had been provided to shield the stage as much as possible, and in spite of the whole staff who were occupied in attempts to protect the work that had already been done. Masses of the wreckage were carried down the river fully fifty miles from the works, and two steel eye bars were recovered at a distance of forty-five miles from the bridge.

The Phoenix Bridge Company commenced the reconstruction of this stage at once, and, by working night and day, within five weeks a new stage was built, and the iron and steel floor, which had been reconstructed also in the interval, was placed upon it. The erection of the 550-ft. span was then proceeded with, night and day, and was completed at the end of October.

The state of the river would not permit any stage being constructed for the third span until the end of November, and it was not until December 9 that the first ironwork for the railway floor was placed upon it. The whole of this span, however, was erected and finished in sixteen days.

On December 25, 1888, only ten months after the Phoenix Bridge Company had commenced the work in their shops, the first regular railway traffic passed over this bridge.

The foundations for the shore piers of the two 490-ft. spans were formed by driving piles 4 ft. apart in both directions, to carry solid 12 in. white oak platforms, about 72 ft. by 36 ft. in area, upon which the masonry of the piers was built. These masonry piers are about 82 ft. high, from the timber platform to the underside of the trusses, and their weight, together with the steelwork and live load, causes a load of 40 tons per pile.

The two river piers, one at each end of the 550-ft. span, rest on pneumatic caissons 81 ft. by 35 ft. in plan at the cutting edge, and 51 ft. high. The sides of these caissons batter 1 in 15 to facilitate sinking. These caissons are constructed wholly of timber. The working chamber is 8 ft. 9 in. in height, and the walls are 4 ft. thick. The roof of the caisson is formed by seven solid transverse and longitudinal layers of 12 in. by 12 in. timbers.

The first caisson was launched on June 2, 1887, and at that time only one course of the roof of the working chamber was built, but the remaining six courses were then added, after which it was floated into position behind a row of protection piles, and gradually sunk, the sides being built up and concrete filled in over the roof of the working chamber. The pneumatic machinery and electric light plant was located on two barges alongside the caisson.

The work of actually sinking the caisson was begun on July 1, and continued without serious interruption until the middle of October, when the depth of the cutting edge below low water was some 53 ft., with an air pressure of 23 lbs. per square inch. At this depth the sinking was stopped, and the working chamber completely filled with concrete.

Both the caissons, before sinking commenced, were placed 12 in. up stream, it being expected that they would drift that amount down the river before the work of sinking was completed. This expectation was realised in one case, but the other remained in its first position, and is consequently 12 in. out of its correct place.

The heat in both working chambers was at

times very great, and a few men were disabled by the so-called "bends," but no lives were lost, nor were the men apparently injured from working eight hours each shift continuously.

When the caisson was entirely filled up with concrete, the masonry of the pier was commenced, and built up to the bearings of the trusses, at the rate of about 8 in. per day, in height. The weight of the whole pier, steel-work, and live load causes a load of about 6½ tons per square foot, after deducting the buoyant effect of the displacement.

It has already been stated that no specific process of manufacture was demanded for the steel forming the trusses, provided the same stood the tests specified. These tests were as follows:—The ultimate tensile resistance of the steel to be used in tension must not be less than 29 tons or more than 33 tons per square inch, and the ultimate tensile resistance of the steel to be used in compression must not be less than 32 tons or more than 36 tons per square inch. These tests are specified to be made in the following manner:—From one ingot of each cast, a round sample bar not less than ¾ in. in diameter, and having a length not less than 12 diameters between the jaws of the testing machine, shall be furnished by the manufacturer, and from these test-pieces alone the quality of the material shall be determined. Such test-pieces must have an elastic limit not less than one-half the tensile strength of the test-bar, and a percentage of elongation not less than 20 per cent., and a percentage of reduction of area not less than 40 per cent. In determining the ductility, the elongation shall be measured after breaking on an original length of ten times the shortest dimension of the test-piece.

There appears to have been considerable difficulty in obtaining the steel for the heavy plate links which were required, owing to the small amount of work which was put upon the metal between the ingot and the finished plate.

Several tests were made upon the full-sized steel eye bars, and these are of special interest. The general result is as follows:—For open hearth steel eye bars, 7 by 2 in. in section, and 28 ft. 8 in. long, the steel stood 31 tons per square inch and stretched 13.3 per cent. in a length of 24 ft., and 41 per cent. in a length of 12 in. For an eye bar of Bessemer steel 8 by 1½ in. in section and 34 ft. 6½ in. long, the steel stood 32 tons per square inch in tension, and stretched 14.3 per cent. in a length of 31 ft., and 35.8 per cent. in 12 in.

In designing the main trusses the following loading was provided for:—First, for each line of railway, two engines followed by a train of 2,500 lbs. per lineal foot, and for each roadway and side-walk 60 lbs. per square foot. The wind-pressure was calculated for 30 lbs. per square foot on the exposed surfaces of both trusses, and on the vertical projection of the floor system, and also on a moving train surface, averaging 10 square feet per foot-run of bridge. All the parts of the structure are so proportioned that the combined effects of temperature and all specified loads, except wind-pressure, shall not cause the stress per square inch to exceed the following limits:—

#### For Iron.

In tension, 5 tons.  
In compression, for lengths less than fifty times the least radius of gyration, 4 tons.

In shearing across fibres, 3½ tons.

In bending, on extreme fibres of pins, 7½ tons.

On bearing surfaces, 6 tons.

The stresses per square inch in compression, for members whose length exceeds fifty times their least radii of gyration, were to be reduced according to certain formulae given.

#### For Steel.

In tension, on chord bars and end main diagonals, 8 tons.

In shearing on rivets and pins, 5 tons.

In bending on the extreme fibres of pins, 10 tons.

On bearing surfaces, 7½ tons for rivets and 9 tons for pins.

In compression, on top chords and inclined end-posts, provided that the ratio of length to least radius of gyration does not exceed fifty, 7 tons per square inch; but for other struts the stress was reduced according to certain formulae given.

An addition of fifty per cent. to all specified intensities of working stresses was allowed for all wind stresses, and for all combinations of wind stresses and other stresses.

Bed plates and bearing plates are so proportioned that the maximum pressure per square foot on the masonry does not exceed eighteen tons, and the diameters of rollers which are of steel are calculated so that the pressure on them per lineal inch does not exceed  $\sqrt{540,000/d}$ , where  $d$  is the diameter of the roller in inches. The variation of temperature allowed for is 150 deg. Fahr. Great care was taken in making the links, as it was specified that in no case must the distance between the centre of the pin-holes be more than ¾ and of an inch from the true dimension, and the diameter of the pin-holes was not allowed to exceed that of the pin by more than ⅛ of an inch for pins under 3½ inches diameter.

In a few instances where the plates were thin the steelwork was allowed to be punched, but, as a general rule, in all important parts of the main trusses it was drilled. Annealing was also insisted upon when any part of the steelwork had been partially heated.

Before the work left the shops it was thoroughly coated with boiled linseed oil, and all planed and turned surfaces were protected by being coated with white lead mixed with tallow. After the erection of the structure it received two coats of red lead.

The above description from Mr. Burr's paper may be taken as representing the best American practice in bridge building, and English engineers will notice that it differs in many particulars from the system adopted in this country.

It appears to us that until the manufacturers of bridges are asked to submit their own designs, made in conformity with a specification of an engineer advising the intended purchaser, true economy will not be obtained.

The system at present generally adopted here not only causes the cost of a structure to be considerably increased, but it is also the cause of much delay in the progress of the work, occasioned by the manufacturers being often compelled to ask for many alterations in the details of the designs. No one is so well able to judge, as the manufacturer himself, where he can save expense in construction; and therefore his tender, based on his own design, would be necessarily less than on designs made by others, who are probably unaware of the appliances he has in



his shops, and who generally do not attend very much to details that are most important from an economical point of view.

In England at the present time a pin-jointed truss is not considered to be so satisfactory as a girder with riveted joints, and it is most exceptional for them to be used. Such trusses, however, are easily erected, and the rapidity with which the Cincinnati Bridge was built is a good deal owing to the design of the truss being such that most of the work could be completed in the Phoenix Bridge Company's shops, where every facility is obtained, leaving but little to be done at the site, where the work is always more difficult and takes much longer.

Bessemer steel for important structures has not at present been adopted in this country; all specifications for steelwork stating that the material is to be that known as "open hearth." The tests for the steel are almost identical with those specified for the Forth Bridge, although the stresses allowed in that case are somewhat exceeded, notwithstanding that in this country a wind pressure of 56 lb. per square foot is provided for.

In conclusion, we think that the whole work reflects the greatest credit on all who were engaged in bringing to so successful a completion a structure of such importance as the Cincinnati Bridge.

#### NOTES.

**T**HERE is a grave note of warning in Lord Norton's letter in Thursday's *Times* in regard to the principle involved in the London County Council's Bethnal-green scheme, that it is their duty to take in hand and rebuild large tracts of insanitary dwellings in London; a principle which the majority of the Council seem disposed to affirm as the right one for future adoption. Lord Norton upholds the principle that landlords of insanitary property should be compelled to realise their responsibilities and to do their own duty to their tenants and the public, instead of leaving the County Council to step in and do it for them. As an unintentional rider to this comes the report, in another column of the same day's paper, of the judgment given against the landlords of forty-one tenements by Mr. Montagu Williams, on the action of the Sanitary Authority of the Parish of St. Matthew Bethnal-green, compelling them to close their houses until such improvements had been carried out as would satisfy the Sanitary Authority. Mr. Montagu Williams had the good sense to visit the property himself and form his own independent opinion before giving judgment, a degree of conscientious trouble which not every Magistrate will go to. There is no doubt that if the London County Council are going to make it an essential part of their function to purchase and rebuild large areas of bad property, unless they sternly refuse compensation to the landlords of houses that are "unfit for human habitation" for anything but the mere value of land and materials, they would actually be giving an encouragement to unconscientious landlords to leave their property in an insanitary condition. Then it appears there is a great feeling on the part of inhabitants of the Bethnal-green district to be delivered from the huge blocks of "model dwellings," and to have houses rebuilt on a smaller and more home-like scale. Such a course would be impossible in carrying a large scheme under the "Housing of the Working Classes Act," but it would be not only possible but the natural outcome of the matter, if individual landlords were come down upon and compelled each to rebuild or render habitable his own house property. Of course this is a much slower process, and the glamour about the County Council scheme is that it promises a great work of improvement to be carried out comparatively promptly: and no wonder this attracts people who are wearied with the slow progress of sanitary reform in London. Perhaps it may be as well that this large experiment

should be tried, but the drawbacks to it already suggested must not be forgotten, besides another which very few people are alive to, viz.: that not only has the building of lofty blocks of barrack-like dwellings a very depressing effect on the appearance of a neighbourhood, but that the crowding of the same number of people in tall blocks of buildings with a certain minimum space between them may be nearly as unhealthy as crowding them in lower houses more closely set. Overcrowding vertically is very little better than overcrowding laterally; it is only another way of arranging the same number of people on an area too small for them.

**T**HE action of the Mansion House Committee on Railway Rates, in condemning the Board of Trade proposals, is endorsed by the Railway and Canal Traders' Association, a resolution to that effect having been passed at a Council meeting of the latter body on the 5th inst. These proposals cannot, in their opinion, be accepted as just and reasonable,—although Lord Cobham, a Great Western Director, alluding to this subject on the very same day, declared that Parliament was "proposing to whittle down their profits to the vanishing point." Curiously enough, a deputation of South Wales freighters had, a week previously, protested specifically against the Great Western schedules; complaining that (particularly with regard to coal, iron, steel, &c.) the Company were given excessive charging powers as compared with other companies. Turning to the statistics supplied by one of the other companies thus alluded to,—the Midland,—it appears that out of the annual loss of revenue which, it is asserted, they would have to bear if the Board of Trade's proposals became law, £48,216 is placed under the head of coal and coke, and £28,176 for iron and steel (undamagable). This is rather more than half of the total. To add to the conflicting testimony on these points, the Birmingham and District Railway and Canal Traders' Association, led by Mr. Chamberlain, M.P., asserted before the President of the Board of Trade last week that the proposed hardware rates would be from 50 to 150 per cent. higher than those at present in force. The Birmingham district is served almost exclusively by the Midland, Great Western, and London and North-Western, and Sir Michael Hicks-Beach is going to try and get to the bottom of the matter by having a certain number of test cases thoroughly gone into, with a view to ascertaining if the alleged differences really exist. He will probably find that the parties to the dispute are going upon different data,—particularly with regard to the existing powers of the companies in the matter of terminals. In order to demonstrate further the remarkable difference of opinion existing upon this subject, we extract the following from a letter published in a contemporary last Saturday:—

"It is not to be denied that the Board of Trade proposals will be of sufficient advantage to the iron trade, and especially to the finished iron and steel industries. The classification has been lowered for a great many articles of the first importance, thereby allowing of their being carried at much lower rates than those to which they would have been subjected under the companies' proposals, and lower also than those to which they have, in the past, been liable."

Now, this would be written about the time that Mr. Chamberlain was making his energetic appeal on behalf of the iron and steel industries; and yet it appears,—not, as might be imagined, in a railway organ,—but in the columns of the *Ironmonger*.

**T**HE Government have again introduced a Bill for the purpose of establishing a Commission, before whom Private Bills relating to Scotland shall be heard. The proposed change is a very desirable one. Great expense is incurred by bringing up witnesses, say from Aberdeen, in respect, perhaps, of a Water Bill, or some essentially local matter,

to London. Parliamentary Committees are by no means first-rate tribunals. It says a good deal for the practical common sense of the average Englishman that these curiously-composed bodies have got through their business as well as they have done; but a strong Commission would not only do their work more quietly but better. It is obvious, however, that if Scotch Private Bill business is to be transacted in Scotland, the same system must be adopted in relation to Ireland, and probably in some modified way in relation to England and Wales also. It seems also likely when this change of system occurs, as occur it certainly will, the system of Grand Committees of the House of Commons will be enlarged, since more members will be available to serve on them, and this again will help to accelerate the general business of the House.

**I**N reference to the new Institute at Berlin for Professor Koch, already referred to, we hear that the Government has taken the matter up in a very energetic manner, the tenders for the proposed provisional works having been accepted on most liberal terms, cheapness and Prussian economy being for once left out of the question, the best materials put together on the most improved system in the shortest possible time being all that is required. The hospital for Division II. of the Institute is planned for 128 patients, and will include, besides the four smaller and four larger wards erected on the isolated barrack system, extensive accommodation for doctors, nurses, and a large number of servants, the usual receiving-rooms, studies, &c., localities for the administrative and kitchen departments, and a small lecture amphitheatre (with fifty seats) for Professor Koch's special use. The "barracks" will be constructed of timber-framing with an outside covering of gypsum slabs, and a double line of planking on the inside, the whole standing on a foundation of "béton." The Government "Bauleinspector" Böttcher and an assistant have been to Paris to visit Pasteur's Institute, for the purpose of studying the fittings of this establishment, which are to be adopted, as far as possible, in Berlin. Instead of the estimated 370,000 marks, 500,000 are to be spent, directly and indirectly, for the provisional work. One hundred and fifty beds (with all expenses pertaining to the keeping of them) of the new city hospitals at Moabit and Urban have been put at the disposal of Professor Koch by the municipality of the capital. Among the instances of general interest and munificence, we may mention the gift of Herr Bleichröder, Consul-General for Great Britain. This donor has put 1,000,000 marks (or nearly 50,000*l.*), together with a very suitable site, at the disposal of Professor Koch, for the erection of a small hospital of sixty beds for the treatment of infectious diseases, and intends finding thirty beds in hired premises until the completion of this hospital.

**A** QUESTION was put to the Postmaster-General on Monday evening in regard to the Liverpool General Post-office, which has for many years been located in a part of the grim and gloomy building known as the Custom-House, against which complaints of unhealthiness and inconvenience have been made for many years, probably with ample cause, and it was urged by Sir G. Baden-Powell that Liverpool ought to have a new Post-office building on the same footing as Manchester and Birmingham. Mr. Raikes, while declining to admit all that was urged against the present quarters of the Liverpool head office, promised to direct special inquiry to the subject. If a new office is to be built for Liverpool, we beg to repeat strongly the recommendation that it should either be entrusted to an eminent architect or be the subject of an architectural competition. The buildings which are turned out from the Office of Works



for this purpose are utterly without architectural refinement or interest. In France every such building would be the subject of a public competition in order to obtain the best planning and the best architecture which the architectural ability of the day could afford, and to erect a building which would be an architectural ornament to the town on which it was conferred. In England each new Post-office is only a new architectural eyesore.

THE Society of Antiquaries of Scotland have now taken possession of the east wing allotted to them in the Scottish National Portrait Gallery. The scheme of arrangement, under the superintendence of the Curator, Dr. Joseph Anderson, locates, in a general way, the historical articles on the ground floor, the pre-historic on the first floor, and the comparative collection on the upper floor. The two former collections are confined to Scottish articles, but the comparative section embraces articles from all parts. In the Council-room, at the extreme east end, will be hung the collection of portraits, which will be seen in a manner which they could not possibly be in the vacated premises. The library, which is located on one of the upper floors, is lighted from above, and half-way up the walls is fitted with a gallery having a light iron balustrade, by means of which access is obtained to the upper tiers of books. Although the room is much larger than the former library, the greater part of the available space is required for the accommodation of the books. The society will find itself very comfortable in the new premises provided for them by private munificence.

WE regret to observe, from an answer given to a question put by Sir G. Campbell in the House of Commons on Tuesday night, that there is no intention at present of taking any further steps towards the permanent lighting of the British Museum by electric light for evening opening. The excuse is that the evening attendance had not been kept up, the average, which in February was 635 per evening, having fallen March to 367, and in November to 145. No doubt at first curiosity drew a good many persons there who had no serious interest to serve, but we are convinced that if the Museum were known to be permanently open in the evenings it would be a boon to numbers of students, which would be fully appreciated and made use of in the long run. It is not a question merely of the working classes (commonly so-called): there are numbers of professional men who are mostly detained at other work during the day, who would be thankful for the opportunity of study at the Museum without the inconvenience of breaking away from their regular hours of employment.

ANOTHER important addition to what may be termed the domestic electric lighting of London will now shortly be made. At a general meeting of the Reform Club held last week it was decided, by a very large majority, that the club premises should be lighted by electric light. Two years ago the same proposition was mooted, but the matter did not proceed further. In the interval of time which has elapsed, electric lighting has become cheaper, and there is no doubt that the delay has saved the members of the club a considerable sum of money. This decision is noteworthy because the Reform Club, in spite of its name, is a somewhat conservative body, largely composed of practical men. It may, therefore, be pretty well assumed that if this system of lighting is adopted by this club, no building, domestic or otherwise, of any size in London will long be without it. While touching on this subject of electric lighting it may be well to call attention to the fact that although the Central Hall of the Law Courts, as well as the courts and court corridors, are lighted by electricity, yet

the corridors and wings of the staircases, as well as all the rooms in the east and west wings, where a great amount of important business is transacted,—as, for example, in the chambers of the chief clerks in the Chancery Division,—are still lighted by gas, and that somewhat dimly. Considering that the Law Courts have engines and cellars for the purpose of electric lighting, the entire building should be lighted by this method.

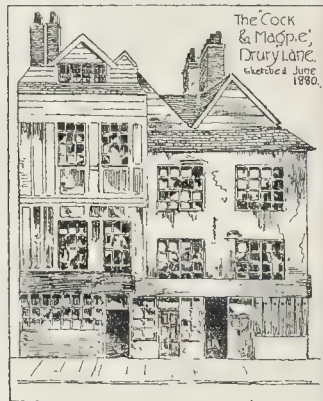
IN days when a number of the working classes seem only desirous of getting as high wages as possible for as little work as possible, it is refreshing to read such a letter as that of a working miner, Benjamin Morris, which was published in the *Times* of Tuesday in regard to the "Miners' Eight Hours Bill." The writer does not scruple to say that the passing of such a Bill would result in a monstrous injustice to the workmen, and that it would be impossible in practice to carry it out; that is for men who, like Benjamin Morris, wish to do their work well and honestly. The writer's position will be best appreciated by the quotation of one or two sentences from his letter:—

"The Mines Regulation Act prohibits any workman from leaving his stall or working place before making it safe; and, in order to comply with the said Act, it is often necessary to stay half an hour and more after the pit has ceased turning coal for the day, and, owing to the nature of the work a miner has to do, this cannot be avoided. You will at once see that if a restriction is put upon the hours a miner is to work he will be compelled to violate one rule in order to comply with another, and the result will be endless litigation. The present rule says that no workman shall place or leave any coal or other material in such a way as to impede the air course. It often happens that just before the time for leaving work a fall of coal will take place, sometimes falling against a pack which has been put up to support the roof, and if left in this position it would greatly impede the air current, and for so leaving it the miner would be liable to prosecution or heavily fined. I have often been compelled to stay three-quarters of an hour in order to comply with the rule. But if the proposed Bill should become law you will at once see that we shall be placed in a great difficulty. . . . The injustice of the proposed Bill is apparent from the fact that it often occurs that an half-hour's extra work would save the miner a great deal of labour the following day, and also loss. I ask, therefore, what moral right has the law to interfere with me in working at my trade to my own benefit so long as I injure no one by so doing? . . . In Derbyshire the eight hours system is already recognized, and no one was more surprised than the miners themselves when the question was forced upon them. I am in constant conversation with my fellow-workmen upon this subject, and they all consider it would be unfair to expect to be paid for waiting to their work, for this is what the eight hours from bank to bank means, and the objections to this are too numerous to particularise in a letter. Moreover, it would be absolutely unfair to the general public, who have always been ready to put their hand in their pocket when any catastrophe has taken place and funds have been needed. Coal is already dear enough, and to force another advance upon the same would be base ingratitude for past kindness. I observe that some platform orators declare that it will make no difference either in wages or the price of coal, because they say the miners will be able to work with increased activity, a statement which is ridiculously absurd, forgetting that even if this were true it would mean increased danger and loss of life."

It would be a good thing for England if there were a larger proportion of working men (a large proportion we trust there is) animated by the same spirit of honourable pride in doing their duty thoroughly.

HAVING long outlived their younger and more lordly neighbour, Craven House, the two old gabled houses in Drury-lane, near Wych-street, have at last been pulled down. That to the south was conspicuous for its panelled front; the other was formerly known as a tavern by sign of "The Cock and Magpie." When Justice Shallow vows that Falstaff shall remain to enjoy his hospitality, he swears "by cock and pye, sir, you shall not away to night." Here, in all likelihood, we have the origin of the sign. In his "Illustrations to Shakspeare,"

Douce traces it to a burlesque remembrance of the once solemn oath of fealty or for a deed of chivalry that was taken upon a dish of roasted pheasant or peacock. It has been said that this tavern gave a name to, or took its name from, the Cock and Pye Fields over which Seven Dials was built, by Neale, a speculator, in 1694-5, but there was another tavern of that name, to the north-west, wherein, we believe, this particular connexion should be sought. A copy of S. Rawles' print (1807) of the houses we refer to, together with J. Findlay's water-colour (1850), will be found in the Crace Collection, British Museum. They are included in the views taken by the Society for Photographing Relics of Old London, and in the accompanying description we read:—"A writer in the *European Magazine* for 1807, vol. 52, p. 33,



where also an illustration is given, says that tradition, derived from very old persons, who had long been dead, asserts that this was known as a place of entertainment in the reign of Henry VII. It then looked over the fields. Towards the close of the reign of James I. the houses at the upper end of Wych-street began to be built. Probably no part of the existing houses is of earlier date than the first half of the seventeenth century." Close by lived Nell Gwynne, whom Pepys, on his way to Westminster, saw standing at her lodging's-door in Drury-lane on May 1, 1667, watching some milkmaids with garlands upon their pails, as they danced with a fiddler going before them. The memory, at any rate, of Clarges's Strand maypole is preserved by Maypole-alley, by the side of the Olympic Theatre (just rebuilt) which, together with Craven-buildings, stands on the site of Craven—originally Drury—House.

IN answer to a question in the House on Thursday week last, Mr. Plunket is reported to have said that the old table now placed in the tea-room served for the table of the House from 1706,—when Sir Christopher Wren was employed to reconstruct the fittings and furniture of St. Stephen's Chapel, after the increase of members consequent upon the Union,—to 1834, when it was saved from the fire. This is the table which is depicted in the painting of the House of Commons which the Emperor of Austria presented, in June, 1855, to Her Excellency Lady Paget, wife of our Ambassador at Vienna, for the National Portrait Gallery. In that same year the trustees deposited the picture in the National Gallery, where it has been hung in a basement room of the eastern wing. This picture, painted in London, is the work of Karl Anton Hickel, portrait painter to Louis XVI. and Queen Marie Antoinette. Hickel retained it in his possession on leaving this country for Germany. His representatives sold it, in 1816, to the Emperor Francis I. of Austria. It shows the interior of the house in 1793; and, as some say, in January



or February, a few days after the French had executed their King and declared war against England and Holland. We may suppose, then, that Pitt, who is at the table, is speaking in advocacy of taking up the challenge by sending the Duke of York's expedition to Ostend. The Speaker we take to be Addison. On his right may be recognised Canning; R. Pepper Arden, Master of the Rolls, in his robes, elevated Lord Alvanley in 1801; Dudley Ryder, who succeeded as second Lord Harrowby, and was at that date, we believe, Paymaster-General; Richard, second Earl of Mornington in the peacocks of Ireland, created Marquis of Wellesley six years later; and Henry Dundas, afterwards Viscount Melville. Erskine, Sheridan, and Fox are identified amongst the figures on the left side of the chair.

ON the opposite wall hangs the picture,—bought for 2,520*l.* at the Hamilton Palace sale (July, 1882), by the National Portrait Gallery Trustees,—showing an interior in old Somerset House. At a covered table are seated figures of the eleven Commissioners, who on August 18, 1604, ratified a treaty of peace and commerce between England, Spain, and the Archduchy of Austria. There we see named portraits of Charles, first Earl of Nottingham, K.G., Lord High Admiral of our fleet that opposed the Spanish Armada; with the Earl of Dorset, and his successor in the High Treasurership, Lord Cecil of Essendon, who on August 20 of that same year, was created Viscount Cranbourne; William, first Earl of Northampton, Lord President of the Welsh Marches and Lord Warden of the Cinque Ports, who eloped from Canonbury with Sir John Spencer's daughter; and Sir William Cavendish, son to the celebrated "Bess of Hardwicke," from whom he inherited her three noble properties,—Chatsworth, Oldcotes, and Hardwicke, and afterwards first Earl of Devonshire. Amongst the other delegates are John de Velasco, Constable of Leon and Castile, and the Prince of Aremburg, of the Order of the Golden Fleece. According to its inscription and date, the painting should be due to Santoxa de la Cruz, 1594, but is considered by Mr. Scharf, upon internal evidence, to be the handiwork of Marcus Gheeraerts, to whom it is officially assigned.

THE exhibition of "water-colour drawings of many-sided nature" (as it is pleasantly entitled) by Mr. Albert Goodwin, at the Society of Fine Arts' Gallery, is a far more powerful collection than that which he exhibited there two or three years ago, and is many-sided in style and variety of power as well as in its subjects. In his preface the artist, referring to the possibility that he had lost something by rushing from one subject to another too erratically, adds that "if there are disadvantages, the pleasure of enjoying the manifold wonder of the beauty of the world has been one that I have had in full." The collection quite answers to the feeling of these words. It is the work of an artist of wide sympathies,—one who is not content with repeating one or two effects that have been thoroughly studied and mastered till the repetition of them becomes a mere business. There are a certain number of those studies of localities expressed in a very delicate scale of colour, of which the artist has produced a good many of late; among them may be mentioned the two views at Buck's Mills, North Devon (1 and 69), "Abingdon" (41), "Bury St. Edmunds" (21), "Ifley Mill" (29), and "Dordrecht" (35), with the brass milk-cans in the foreground. But there are other works of a very different stamp from these; special effects of nature portrayed with great power. Among them may be specially mentioned the night effect over the sea in "Hartland and Lundy Island Lights" (7), a most remarkable success in what might be thought an almost impossible subject; "Canterbury" (10), the canal and

the old brick walls and timber houses, with the cathedral towers rising above; "Abbeville" (15), a pile of buildings seen in evening light, with a remarkably fine and wild effect of sky; "The Maclestrom" (47) in illustration of Edgar Poe's tale; "Salisbury Close, Twilight" (51), to which the artist appends the note, "I do not mean to say that all twilights are as blue as this, but this one was;" "The End" (54), a sad-looking evening scene with the timbers of a wrecked ship in the foreground; "Woolacombe Sands" (67), another scene of coast desolation which seems like the end of a romance. Independently of the mere ability in the management of materials which these sketches exhibit, it is not often that one finds so much real poetry in a collection of water-colour sketches.

AN interesting collection of water-colours is now on view at the Dudley Gallery. Mr. James, whose work fills the room (divided for the time into two, the "Gold" and the "White"), has gone both far and near for his subjects. Besides a large number of exquisite flower subjects, there are landscapes from Scotland, the Riviera, and nearer home in Sussex and Rutland. Many are "impressions"—very charming bits of colour, with the freshness of work done at once and on the spot; but there is in most, and more particularly in the subjects in which architecture is prominent, a considerable grasp of effect and detail without unnecessary labour. Perhaps the best are those from "Fort Augustus" (65); a peep into the door and up the stairs at the "Old King's Inn" (60); "Maria's Emporium" and Nos. 15, 22, and 42. These are in the "White room." In the Gold room we noticed "New Romney" (104) and "Sandwich" (113), the latter the better of the two, and a very fresh bit of landscape at Uddimore, Sussex (108). Many more are purely sketches of effect and "values," but the few we have mentioned show what can be done with simple architectural subjects by a competent hand.

MOST readers who visited the Royal Academy this year will remember the picture of "Tulip-culture," representing beds of these flowers of different colours. Mr. Hitchcock, the painter of this work, is one of the Americans who have become artistically French, and a small collection of his paintings, one of which, "Maternité," gained him a gold medal at the Paris Exhibition, is on view at the Goupil Gallery, and is worth a visit, though there are no other paintings equal to the two we have named. In another room at the same house is the set of drawings made by M. Boutet de Monvel in illustration of the novel "Xavier." These were made for reproduction in chromo-lithography, which we presume accounts for their rather hard and precise style, but in point of character and drawing they are admirable, and almost tell the story without the aid of the book.

PROPOSED HERALDIC EXHIBITION IN EDINBURGH.—According to the *Scotsman*, it is proposed, in connexion with the visit to Edinburgh in the summer of 1891 of the Royal Archaeological Institute of Great Britain and Ireland, to hold an exhibition illustrative of Heraldry in its various aspects. The exhibition will be divided into two sections—a historical section, dealing generally with objects of heraldic interest; and a decorative section, illustrative of heraldic painting and decoration as a branch of the Fine Arts. Mr. A. Ross, F.S.A., Scot., Marchmont Herald, has undertaken the secretaryship of the former section, which will appeal mainly to the historical and genealogical student; and the latter section, which it is hoped will be of interest to decorative and other artists, will be under the more immediate direction of Dr. R. Howard Anderson, architect, and Mr. J. M. Gray, curator of the Scottish National Portrait Gallery. Mr. Thomas Ross, architect, joint author of "The Castellated and Domestic Architecture of Scotland," has undertaken to superintend the production of a series of drawings and reproductions of painted and other heraldic decorations of old Scottish castles and mansions.

#### THE MODEL FOR THE NEW FAÇADE OF MILAN CATHEDRAL.

OUR readers may remember that one of the conditions attached to the first competition for the new façade for Milan Cathedral was that the finally successful competitor should have a wooden model of his proposed façade made, to a scale of one-twentieth the size of execution; and that until this was done he was not entitled to the second half of the amount of the premium, the first half of which was payable on the announcement of the choice of the jury. The model of the late Signor Brentano's design, which has been made in accordance with these conditions, is now on view at Milan. The model, we should add, according to the terms of the competition, was made at the cost of the Cathedral administration; the architect, or his representative, giving only his skill and supervision to the work. Moreover, the model of the new façade was to be made in relation with the old model of the cathedral now existing in the offices of the administration.

This same ancient model is a very singular affair. It is of course of the scale of one-twentieth already notified as the scale for the new model, and is executed in wood in a rough-and-ready manner which sufficiently betrays the epoch of its execution; an epoch in which Gothic had begun to be interpreted in a somewhat arbitrary manner. Nevertheless the old model is worth a visit. It is to be found in the cathedral offices, at No. 1, via Archivscovado.

According to the conditions, Brentano received the 20,000 lire, the half of the premium, when he was announced as the successful competitor, and had then to proceed to direct the construction of the model. It should be borne in mind, however, that his design was not accepted by the jury without some reservations. They commenced by expressing great admiration for the portals in his façade, to which perhaps they were specially led by the fact that there does not exist at present anything like a decent entrance portal to the cathedral. The transepts have a kind of lean-to of comparatively modern date, and at the side of the cathedral is a small modern entrance of anything but monumental character. It is no wonder therefore that the jury were struck with this point in the design, and said that "to create a central entrance and another at each side, all of dignified character, was a problem which Signor Brentano had perfectly solved;" but they went on to express the opinion that in order that the rest of the design should harmonise with the entrances, it was desirable that the central portion of the design should be somewhat raised.

The desire thus expressed was naturally equivalent to a direct instruction; but unfortunately, from whatever reason, it has not been attended to. The architect had not had time to study this proposed alteration seriously, or to leave any adequate drawings for it. He did however make some attempt at meeting the criticism of the jury. He made three sketches of the façade with the centre portion raised, but these were not, as he himself said before his death, to be regarded as definitive studies for the modification of the original design, about which in fact, he had not been fully persuaded himself. He did not himself believe the alteration to be necessary and was disposed to wait till he saw better reasons, as he thought, given for it, and especially till he saw the effect of the model. Possibly he would have made two models, one representing the original design, the other the modification.

Brentano sent his drawings to Siena as an *envoi* in connexion with the travelling student-ship which he had gained in the Go-i-Feroni competition some years before. Only the photographs of these drawings, which had been taken by the order of the cathedral administration, remained at Milan.

Of the modified drawings previously referred to, no notice has been taken in making the model, which is simply a reproduction of the first design. It is the nature of models in relief to bring out defects in a design unsuspected when it was only shown in drawings, and it has been so in this case; the model in relief producing an effect very different from that conveyed in the picturesque and cleverly-executed drawings.

The model shows even more plainly than the drawings, in the first place, the necessity for the raising of the centre, not only for æsthetic but for what may be called organic structural



reasons. In the central portion there is a grand window, suggested by those in other parts of the building; but no other window in the cathedral is so far below the vault as this one would be, and therefore it is out of harmony with the whole architectural ordinance of the building.

The great portals, which were so much admired in the drawings, as shown in the model are the objects of a great deal of criticism. The portals, as portions of a façade, have two faults; the first in regard to their connexion with the subbase (which only applies however to the central one); the second in regard to their gables, which are out of character with the style of Italian Gothic which belongs to Milan. M. de Geymüller, who has written an admirable critique on the design, goes so far as to say that these gables would hardly be more out of place in front of the Pantheon than in front of Milan Cathedral. Another mistake which appears to me to be revealed in the model is that the portals are too much crowded and broken up with a multitude of little columns and other small details, in keeping with Gothic of another school no doubt, but out of keeping with Milan, which has a character of its own, a kind of compromise between northern and Italian Gothic, and which is precisely what gives the cathedral a good deal of its special interest, as also, it must be admitted, some of its greatest faults. And one of the characteristics of the building is that there is plenty of wall surface around and in connexion with the windows and doors generally, giving them so far a monumental effect; and there is in fact, hardly a regular shaft or colonnette in the whole building. And the model of the design shows clearly that in comparison with the detail of the existing building, the central portal is in too high relief and the details too pronounced.

The foregoing may be taken as a fair expression of the general opinion among competent critics in regard to the effect of the design as seen in the form of a model; and while it was formerly said that any new façade to Milan must be logically composed in relation to the interior, the effect of the model, in which this principle has been adhered to, is rather to support the judgment of those who said from the first that the new façade ought not to be restricted by the lines of the existing building.

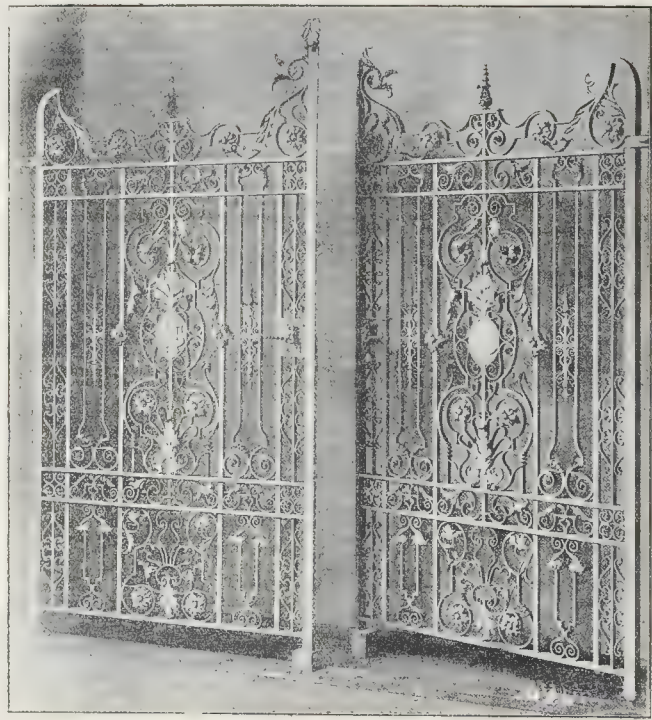
The case no doubt would be very different but for the lamented death of the young architect. I remarked in a former communication that if the model did not give satisfaction, the question of the façade would remain in the region of projects, and the design of Brentano would merely go to swell the number of unexecuted designs for a façade for the cathedral. I do not believe, and the majority of Milanese who take interest in the matter do not believe, that the proposed façade will be executed, at all events within any short time. As before observed, it might have been different if Brentano had lived; but now there are so many difficulties, artistic personal, and financial, that it seems unlikely they can all be surmounted.

It may be added, before quitting the subject, that the model referred to has been admirably executed by the Milanese carver, Signor Brambilla, at a cost of 15,000 francs. The work has occupied just a year in execution.

A. MELANI.

**THE ENGLISH IRON TRADE.**—There is no improvement in the English iron market, and, if anything, its tone is even quieter than it has been during the past few weeks, the approach of the holidays having also, no doubt, a share in the quietness ruling. The downward course of pig-iron has not been arrested, warrants practically ruling the market. The Glasgow market has again been flat, and Scotch warrants are about 2s. a ton lower. In Middlesbrough pig-iron, the drop has been 1s., and west coast hematite has lost in value to a similar extent. In Lancashire almost any prices are taken to effect sales, especially of forge pig. Manufactured iron and steel are in no better demand, and easy in tone, concessions being frequently made to accelerate business. Shipbuilders keep steadily at work, and are still receiving fresh orders, although the bulk of the tonnage ordered is gradually decreasing. Engineers continue well employed. —*Iron.*

**THE BRUSSELS SEAPORT SCHEME.**—The municipality of Brussels has decided that, in order to carry out the scheme of making Brussels a seaport through a canal, a limited company, supported by the city, is to be formed with a capital of twenty-two million francs.



A Pair of Wrought-Iron Gates.

#### WROUGHT-IRON GATES.

THESE gates have been recently made on commission by Messrs. Hill & Smith, the design having been made in their house, by Mr. H. P. Hodgkinson. They are entirely hammered work.

#### SYRIAN ARCHITECTURE THE JEWISH TEMPLE.\*

PROBABLY the best use we can make of the Vision in Ezekiel is to unite it with the statements in Kings and Chronicles, and with those in Josephus and the Talmud; we shall in this way arrive at a very fair idea of the appearance and plan of the latest temple of all, that of Herod. For there can be no doubt that the final temple followed the lines of the two earlier temples, only that it was much more ornate than they, and had a larger extent of outer court.

The two subjects on which Ezekiel enters with some detail are the gateways to the two courts and the plan of the temple and its adjuncts. To take his description of the temple first, we learn that there was an open porch 30 ft. wide (taking the cubit at 18 in.). No height is there given, but, if we refer to the Talmud, we find that it states the height as 60 ft. We have thus an opening 60.0 by 30.0, which we may turn into a "portico in antis" by introducing the two columns, Jachin and Boaz, which were set in I. Kings were set in the porch. They thus had some constructional purpose to serve in supporting the porch lintel. What confirms this theory is the height assigned to the columns in Chronicles—viz., 60 ft., with shaft and capital,—which is just the height of the porch given in the Talmud.

What did these columns support? The Talmud tells us that the porch had five carved oak beams as lintels, with stones in between, and that these beams increased in length by one cubit from the lowest to the highest, the highest being 30 cubits long. This would make the lowest beam 22 cubits, so giving it one

cubit wall hold. There is, moreover, a statement that the front of the temple shone from afar with the reflection of the gold which covered it, which seems to suggest that the five carved oak beams were covered with gold hammered to the form of the carving, and thus casing them in from the action of the weather. That wood, and not stone, should be used for the lintels, seems reasonable when we consider the enormous size of stone which would have been required to cover a 30 ft.—or with the columns—an 18 ft. span.

The repetition of the beams is also rational, inasmuch as it relieves the lower beam of much of the superincumbent pressure, in the same manner as the four lintels of the great pyramid mutually aid in relieving the true lintel over the chamber there. The gradually-increasing lengths of the lintels is a master stroke of æsthetic effect, as the result would be a form of lintel resembling a crown, somewhat like a stone which surmounts a lintel of a temple at Baal-Zimmon.

Mr. Fergusson's theory was that the columns and lintel assumed the form of something like the Sanchi Torii, or one of the Japanese Torii, so common in front of their temples, and so in his restoration of the temple he devised a screen of the Torii form, detached from the porch. He finds confirmation of this in the Talmudic statement that transverse beams were placed to tie the framework and prevent it from falling; but the fact is, the ties would be required in the other case also; and he overlooks the statement of the Talmud concerning the layers of stones between the beams, which would not, of course, be required in a detached piece of framework, but would be needed if it was incorporated with the wall.

Another oversight Mr. Fergusson makes is in taking the diameter of the columns as 18 in., because this, he thinks, would accord with classic proportions; he does not seem to have observed the passage in I. Kings and in Jeremiah:—"A line of twelve cubits did compass them about,"—that is to say, the columns were 18 ft. in circumference, and therefore 6 ft. in diameter.

The next statement of moment in Ezekiel is, that there were three stories of chambers entered by a passage that ran round the

\* Portion of Ninth Lecture of course on History of Architecture, delivered by Mr. Aitken, at Heriot-Watt College, Edinburgh, Monday, December 9, 1890.



temple, and which had side doors to the north and south at the east ends of the passage; these passages were repeated in the floors above, and they were approached, it would appear from Ezekiel xli., 7, by stairs, probably in the thickness of the temple walls. Mr. Fergusson reverses these passages, and places them outside the chambers, converting them into a series of open galleries: a very unsuitable form of construction for winter in so exposed a situation, and one that, moreover, shuts out the light from the windows of the chambers.

As regards plan dimensions, Ezekiel gives the temple walls as 6 cubits thick, the passage on lower floor, 5 cubits; the chamber wall, 5 cubits; the chambers themselves, 4 cubits; and the outer wall, 5 cubits; doubling this for the two sides, and adding the 20 cubits for the width of the holy place, makes up the 70 cubits mentioned by the prophet. Longitudinally, the dimensions taken from Ezekiel are: Porch, 11 cubits; wall to holy place, 6 cubits; holy place, 40 cubits; wall, 2 cubits; Holy of Holies, 20 cubits; adding to all these the dimensions of walls, passage, and chambers at the end, results in a total length of 104 cubits. Ezekiel gives 100 cubits. He also mentions a figure of 90 cubits, which evidently refers to the length of the side chambers, which were shorter by the depth of the porch than the total length: if we therefore deduct 11 cubits, being the depth of the porch, from 104 cubits, there remain 93 cubits, a dimension sufficiently near to Ezekiel's 90 cubits, as the 104 cubits is to his 100 cubits, in order to warrant the accuracy of our plan, because it is evident that Ezekiel did not attempt to record fractions of figures where general dimensions were concerned.

Another point of confirmation is Ezekiel's statement of the number of side chambers as thirty: he mentions the length of the chambers as 20 cubits; this gives four chambers at the sides and two at the ends, which, multiplied by the three stories, makes up the thirty.

Another matter in which both Mr. Fergusson and M. Chizep have taken alarming liberties with all the authorities, sacred and profane, is in the introduction of *twin* towers at the east or entrance end of the temple; for this there is not the slightest authority. On the contrary, we are expressly informed in the Chronicles account that there was a *single* tower 120 cubits high. The authority which these gentlemen trusted to, is the Talmudic statement that the porch had chambers projecting 15 cubits from it to the north and south, called the house of the instruments of slaughter; but it did not necessarily follow, as they assume, that these chambers reached to the height of 120 cubits: more probably they did not exceed the height of the first tier of side chambers, and would thus play a more efficient part in the general grouping than the ungainly arrangement which the assumed double tower plan would lend itself to.

#### ARCHITECTURAL SOCIETIES.

THE ARCHITECTURAL ASSOCIATION (LONDON).—At the meeting of the Advanced Class of Construction and Practice on Wednesday evening last, Mr. Maximilian Clarke read a paper with "Quantities" as the theme, taking the following heads for his remarks:—"Should quantity-taking be taught at the Architectural Association? To what extent should the subject be studied by architects? Remarks upon quantities as at present prepared by quantity surveyors. Remarks upon the difference between the London and country methods of preparing quantities." Mr. J. E. Drower was the Special Visitor, and added much to the information contained in the paper.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—A *soirée* in connection with this society took place on the 8th inst., about fifty members being present. Mr. Clibborn, of Birkenhead, gave a description of some in Normandy, illustrated by some lantern slides, contributed by Mr. Thompson, of Liverpool. Later, the evening was passed with music. Mr. W. H. Thorp (president) occupied the chair.

YORK ARCHITECTURAL ASSOCIATION.—The eighth session of the York Architectural Association will be opened on Thursday evening next, the 18th inst., when an address by Mr. B. Priestly Shires, on "Domestic Life of the Middle Ages, as shown by its Architecture," &c., will be given.

GLASGOW INSTITUTE OF ARCHITECTS.—At a general meeting of the Glasgow Institute of

Architects, held on the 2nd inst., the terms and conditions of competition for designs for workmen's dwellings in High-street recently issued by the Improvement Trustees were under consideration. The matter being one of importance in view of its bearing on future competitions, the Institute appointed a committee to frame a letter to the Town Clerk on the subject, and, if necessary, to wait upon the municipal authorities as a deputation from the Institute.

GLASGOW ARCHITECTURAL ASSOCIATION.—The usual monthly meeting of this Association was held on the 3rd inst., Mr. W. J. Anderson in the chair. A paper was read by Mr. William J. Millwain on "Ornament." The right qualities in coloured, carved, and moulded ornament, and the province of each and all, were defined, the writings of Ruskin, Professor Dresser, and others being laid under contribution in the discussion of these questions. With regard to the exact prototype of forms met with in the art of all nations, a *résumé* of the opinions held was given. The essayist gave a review, with analysis, of the great historic styles of ornament, showing that in some, symbolism was a potent influence, in others the æsthetic taste alone was appealed to—e.g., Egyptian and Renaissance. In some, nature was copied with but little intervention of conventionality, in others the abstract laws of form and colour in beast and flower alone imitated; Gothic and Saracenic being examples of these opposites. A short discussion, opened by Mr. A. Muirhead, followed, at close of which the customary vote of thanks was passed.

THE ARCHITECTURAL SECTION OF THE PHILOSOPHICAL SOCIETY OF GLASGOW met on the 8th inst., when Mr. Campbell Douglas, F.R.I.B.A., gave some notes on "The Architecture of the Iberian Peninsula." Among other things, Mr. Douglas called attention to the fact that it is in the east end of the city, where the Moorish citadel and the Christian cathedral are close to each other, that almost the only architectural interest of old Lisbon can be found, for apparently something in the geologic strata of this part has offered more resistance to the severity of the shocks of the great earthquake than in the western parts. It is also noticeable that the Gothic towards the east end of the cathedral, as well as of the ruined Carmo Church further west, is of a fine, severe type of Early Pointed work. Mr. Douglas referred to the manner in which a large proportion of the houses are faced or veneered with glazed tiles, generally of a bluish colour, and known as "azulejos," on account of their being originally of an azul or blue colour, although that is not now universally adhered to. As houses veneered with tiles in this way have only to be well rained on to appear clean and fresh, their introduction would do much to break the dismal monotony of dirty grey in our streets. Mr. Douglas advocated that something might be done to make our footways more interesting. He was much struck in Lisbon with the many beautiful footpaths made in the various mosaic patterns of a brownish black and creamy white. The black is a whinstone, and the light-coloured a carbonate of lime, resembling in character the stone used by lithographers. Elegant and simple yet effective patterns are everywhere to be seen, and in one of the principal thoroughfares for shops—the Chiado—the number of the house is frequently worked into the design. One of the largest squares in Lisbon and some of the smaller ones are admirably decorated in this way. After showing that the building laws which were enacted by the Marquis de Pombal after the great earthquake of 1755, in order that the construction of houses might better enable them to resist the shocks of earthquakes, have been so far altered and modified that they no longer answer their original purpose, but rather make matters worse, Mr. Douglas proceeded to give an account of excursions to the great Church and Monastery of Alcobaça, as well as to those of Batalha. The second half of his paper was occupied with an account of a short visit to Spain, in which he rapidly sketched its history in Moorish and Christian occupation, in so far as each lent its own complexion to the development of its architecture. In Madrid there is little architecture worthy of attention. During the course of the lecture between thirty and forty limelight illustrations were shown, which had been specially prepared. Votes of thanks were accorded to the lecturer, and to the chairman, Mr. James Thomson, F.R.I.B.A.

#### ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the meeting of this Association on the 3rd inst., Mr. J. W. Grover, F.S.A., in the chair, Mr. Sheraton exhibited a mass of lead which had been found in the thickness of part of the walling of the Roman camp at Carnarvon, where it had apparently been deposited in molten state from some conflagration. Mr. Bodger described some Roman coins which have been found at Woodstone Hill, near Peterborough. Mr. Loftus Brock, F.S.A., announced the discovery of a huge "Sarsen" stone, which has been found beneath No. 71, Moscow-road, Bayswater, to all appearance worked to a fairly smooth surface. It is supposed to weigh nearly twenty tons, and when erect it would have been a conspicuous object from the Roman road from London to Silchester, the site of which is the present Bayswater-road. Miss Stoddart having recently presented a fine collection of rubbings of brasses, about 100 in number, a few of them were exhibited to the meeting. They are of additional interest from the fact that they were taken about fifty years ago, and several changes and losses are recorded. Mr. Oliver described a curious inscribed slab in Ashridge Chapel, representing a priest, John Stone, ob. 1395, which appears to have had prior use for some other person. A paper was then read by Mr. Davis on a brass to the memory of John Semis, Mayor of Gloucester, temp. Henry VIII., and Agnes, his wife, which had previously existed in the Church of St. John, Gloucester. It is described in Rudder's history, but had long since disappeared. During some recent restorations portions of a brass were discovered among some rubbish in a vault, and these have now been identified as having belonged to the lost brass in question. The second paper was descriptive of the celebrated Epinal Glossary, and was by Mr. W. de Gray Birch, F.S.A. It was compared with the Corpus Christi and Erfurt Glossaries, and specimens of the Early Saxon words were laid before the meeting.

SOCIETY OF ANTIQUARIES OF SCOTLAND.—The first ordinary meeting of this Society for the present session was held in the Library of the New Museum, Queen-street, Edinburgh, on the 8th inst. The Marquis of Bute, Vice-president, presided. The first paper, which, in the absence of the author, was read by Sir Arthur Mitchell, was entitled, "Fac-similes of the Scottish Coats of Arms emblazoned in the Armorial de Gênes, with notes" and was by Mr. Archibald Hamilton Dunbar, F.S.A., Scot. In the second paper, Dr. D. Christison, Secretary, gave an account of the excavation of a curious fort, locally known by the name of Suidhe Chennaidh, situated on the side of Loch Ane, near Kilohrean. With reference to the stone forts which were so numerous both in the Highland and Lowland districts, whose typical structure was yet comparatively unknown, much remained to be done. He described in detail the results of the excavation, which showed the fort to be of circular form, with a solid wall, containing neither chambers nor gallery, but having on the inside a series of step-like platforms. The next paper was an account of the excavation of two cairns on the estate of Aberlour, Banffshire, the property of Mr. J. B. Findlay, of Aberlour, by Dr. Joseph Anderson, Assistant Secretary and Keeper of the Museum. The first cairn was about 40 ft. in diameter, having its outline marked by a circle of stones of larger size than those composing the body of the cairn. The chamber in the centre of the cairn had been approximately circular, and formed of long slabs, set on end edge to edge, enclosing a space of about 5 ft. in diameter. The floor of the chamber had been much disturbed, but in its upper layer there were found fragments of urns of the usual character of the sepulchral pottery of the Stone Age, and an undisturbed deposit of ashes and charcoal, containing the burnt bones of a cremated interment. The cairn being chambered, it is to be referred to the Stone Age, but to the latter part of that period, when cremation was in use. The second cairn was about 45 ft. in diameter. No chamber or cist was found in it, but the surface of the ground underneath was covered with patches of charcoal and ashes, and at a depth of 3½ ft. under the base of the cairn there was a large deposit of ashes and charcoal, with traces of burnt bones. The fourth paper was a notice of the discovery of a cist and the opening of two cairns at High Banks, Kirkcubrightshire, by George Hamilton, Ardkeen, F.S.A., Scot. The last paper was a notice



by Mr. John G. Winning of a cist discovered at Eckford, in Roxburghshire, in February last, being the third that has been discovered in the locality since 1885.

### Illustrations.

#### CAMBERWELL GREEN BATHS AND WASH-HOUSES.

**T**HIS design, of which we publish two views, interior and exterior, was the one selected by the Camberwell Baths and Wash-house Commissioners (acting under the advice of Mr. Charles Barry, F.S.A., their professional assessor) in the recent limited competition.

As in the case of the baths to be erected on the East Dulwich-road site, by the same architects, the whole of the requisite accommodation for bathers has been provided on the ground floor, and the simplicity of plan thus ensured, in addition to securing the utmost possible convenience to the public making use of the establishment, facilitates an economical system of administration with efficiency of working, easy and effective supervision, and minimum cost of construction.

The men's and women's baths have separate entrances, between these is placed the check-taker's office, so that one person can take the money from both sexes and classes.

The following slipper bath accommodation has been provided:—

24	men's first-class slipper baths.
40	" second-class "
12	women's first-class "
20	" second-class "

Each of these sets or groups (all amply lighted and ventilated) is complete in itself, with waiting-room, w.c., &c., and each attendant in charge of a department can easily supervise the adjoining one by means of the direct through communication that has been provided.

The first-class swimming bath for men is near the men's entrance, with direct access from it as well as from their private baths. Its size is 120 ft. by 35 ft.

As this bath is on certain days to be set apart for women, a separate access thereto has been provided from the first-class women's waiting-room, which room, like the men's first-class waiting-room, would be shut off from the swimming bath whenever necessary, in order to insure absolute privacy to the swimming bath.

The men's second-class baths are also conveniently planned, and are directly approached by a wide corridor from the men's separate entrance.

Eighty-one dressing boxes are provided for the men's first-class swimming-bath, whilst for use in connexion with the second-class swimming-bath (which is of similar size to the first-class bath—viz., 120 ft. by 35 ft.), there are 103 dressing-boxes.

The whole of the accommodation required has been provided, including a superintendent's corridor for the easy supervision of the whole of the departments, and a gallery to the first-class bath, in connexion with which there are unusually spacious staircases, both for convenient access thereto, and in order to meet the stringent regulations now in force for facilitating free and rapid egress in case of panic.

In view of the utilisation of the first-class swimming-bath as a public hall, it has been thought desirable to connect it by means of swing folding-doors with the corridor leading direct to Harvey-road, and in accordance with the instructions, two artists' retiring-rooms, fitted with lavatories, have been provided. These rooms are in communication with the north end of the first-class swimming-bath, where it is proposed to place the platform for the performers, who would probably enter the building from the Harvey-road. All or any of the waiting-rooms adjoining the entrances from Artichoke-row would be available for cloak-rooms; the refreshment-room being placed, for convenience of service, on the first floor, immediately adjoining the kitchen.

The wash-house department has been placed at the end of the site next Harvey-road, from which it is directly accessible, and has seventy-eight washing compartments.

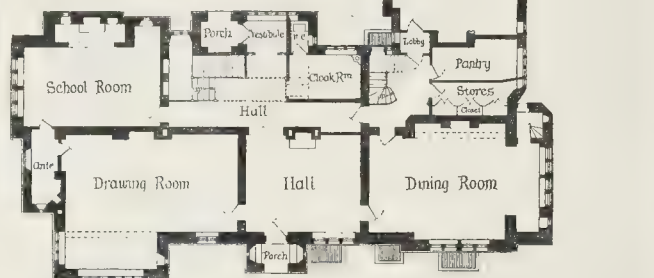
The boiler-house, coal store, &c., with good external access from Harvey-road, are placed in the basement of this department, and would be separated from the upper part by fireproof floors.

As the proposed building, in addition to having its front set back some 22 ft. from the main street, adjoins some very lofty buildings, the authors considered it might be advantageous to incorporate a tower in the design for the principal façade, but this architectural embellishment could be omitted, if thought desirable, without materially injuring the design.

It is proposed to erect the buildings with sound, hard, well-burnt bricks.

The fronts abutting on Artichoke-row and Harvey-road would be faced with the best red bricks with buff terra-cotta dressings. The entrance steps and all staircases would be of granolithic concrete, and all balusters, &c., of iron. All drains to be glazed stoneware pipes, with Stanford's patent joints and embedded in concrete.

The internal walls throughout would be



Ground Plan

Plan of Residence at Street.

plastered or faced with white Suffolk bricks, and the insides of the swimming-baths lined with white, glazed bricks.

All floors and passages would be of fireproof construction, and the flooring round the swimming baths would be finished with ornamental tiling, and a curbed and sunk channel would be formed in order to prevent the surface water from passing into the baths.

The 1st class private baths would be of porcelain, and the 2nd class of enamelled iron.

The front roofs would be tiled with Broseley tiles, and the roofs of the swimming baths covered with the best Bangor duchess slates.

The heating apparatus would be placed in the basement of the wash-house block, and the tanks for the storage of water would be placed in the tower of the front block.

A service laundry is provided, which would be thoroughly fitted up with every requisite appliance, and spacious drying closets are provided.

The estimated cost of the proposed buildings is about 24,000*l.* Messrs. Spalding & Co. are the architects.

#### RESIDENCE AT STREET, SOMERSET.

THIS house, of which two views (the entrance front and garden front) are given, is situated on the brow of a gentle hill, and commands extensive and varied views of the surrounding country, including the celebrated Glastonbury High Tor and "Weary-all" Hill.

The garden front is occupied by the drawing-room (on the left of porch in garden-front view), the inner hall, and the dining-room. The pantries, kitchen, and offices extend behind the dining-room; the kitchen entrance is by the porch on the left-hand side in entrance-front view. The principal entrance is under the oriel window here. On the right, the gable, with chimney rising from the ground, is the school-room or library, and a chimney-corner is arranged inside. The bed-rooms are on the first-floor, with spacious attics over these.

Convenience of planning and general comfort in the apartments have been very carefully studied, and the elevations designed simply expressing the purposes of the interior, and as far as possible in conformity with the characteristic domestic architecture of the country.

A conservatory, vineries, laundry, stables, and a lodge have also been built. The materials for walling are local blue lias stone with Ham

Hill stone dressings. Bridgwater tiles for the roofs. The dining-room is oak panelled throughout, and the hall, staircase, &c., are also of oak. Special heating apparatus to supply warm and hot air has been arranged.

Mr. H. Hawkins, of Glastonbury, is the builder, and has nearly completed his contract. Mr. George J. Skipper, of Norwich, is the architect.

#### SALCOMBE CHURCH, DEVON.

THE illustration shows the east end of this small but solid-looking church, which has recently been erected at Salcombe from the designs of Mr. J. D. Sedding.

#### TWO BRASSES OF KNIGHTS.

THE brass of Lord William de Bryene, Seal, Kent, 1395, belongs to the camail period.

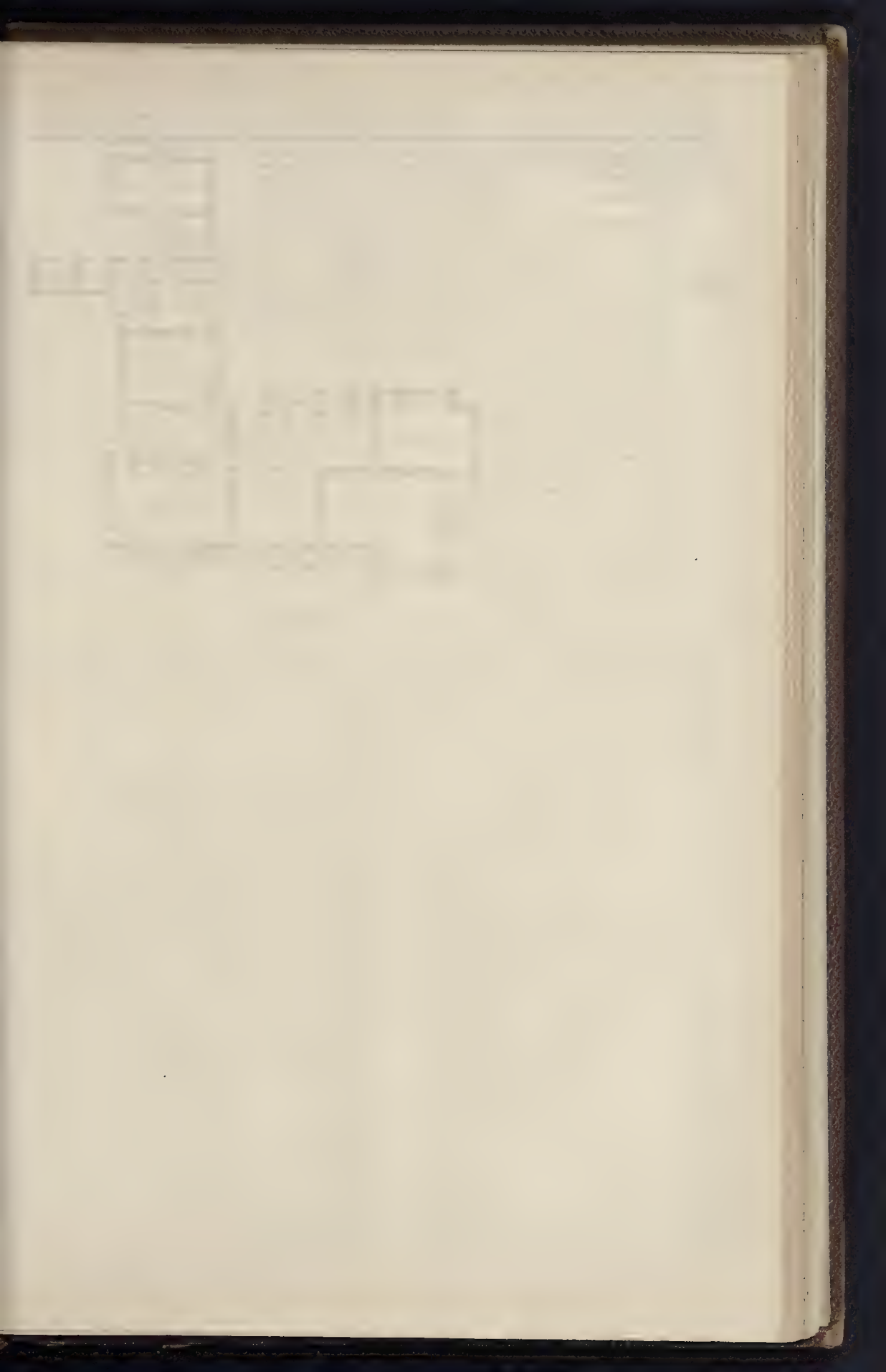
The head of the figure in the basinet rests on the helm with the crest and mantling. The sword hangs from the baldric, which is decorated with square roses. Over the head are two shields of arms, and a marginal inscription is round the slab. The evangelistic symbols are placed at the corners.

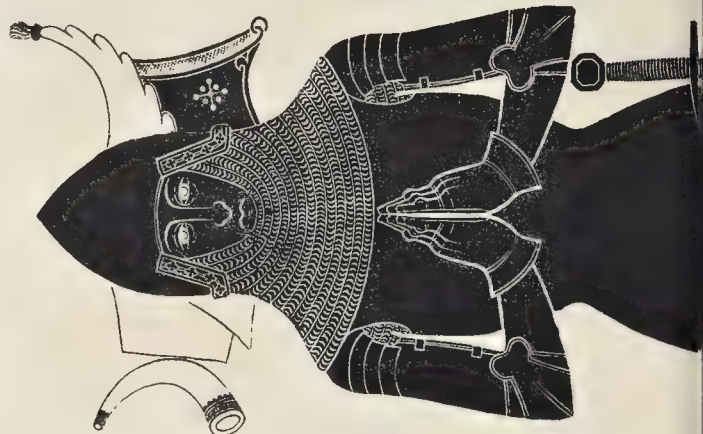
The brass of Sir Reginald Cobham, Lingfield, Surrey, 1403, belongs to the Transition period between the camail period and the Plate and Taces period. The former period is seen in acutely-pointed basinet, and the camail, and the later in the cuirass and taces.

Beneath the basinet is the helm, with the crest orb and mantling. A fillet of roses is placed round the head-piece. The armour on the arm is ornamented, and also the cuffs of the gauntlets. At the armpits there are fringed armholes, beneath which mail is worn, which may also be seen at the knees and insteps. The sword hangs in a socket which is attached to the baldric which passes across the waist. The scabbard is ornamented with a pattern similar to that on the scabbard of Sir W. de Tending (see *Builder*, November 22). Shields of arms are placed on either side of the figure, and a marginal inscription completes the composition.

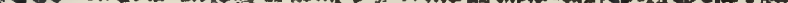
In "Burtell's Brasses," p. 61, there is an illustration of this, showing that the crest, orb, shields, and the hilt of the sword and dagger were then lost. They have since been restored. A. O.







¶ **W**illiam de Wyke, a knight, was the first that began to print in England, in the year 1477.



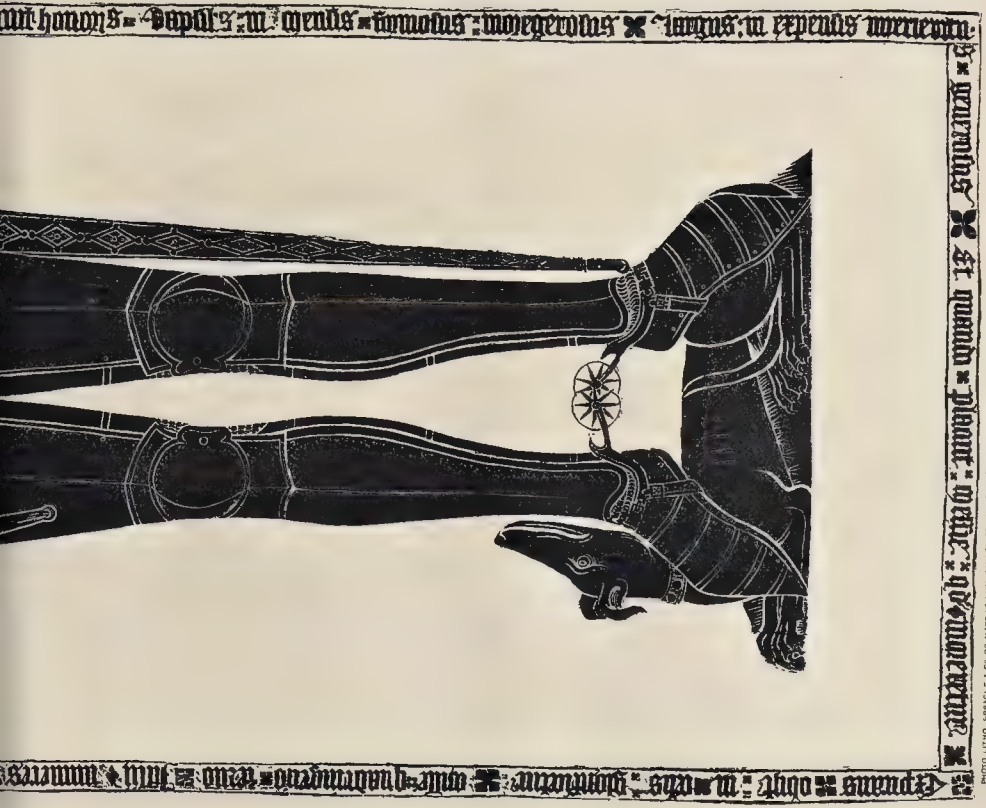






LORD WILLIAM DE BRVENE, 1395  
SEAL, KENT

FROM RUBBINGS BY MR. ANDREW OLIVER, A.R.I.B.A.

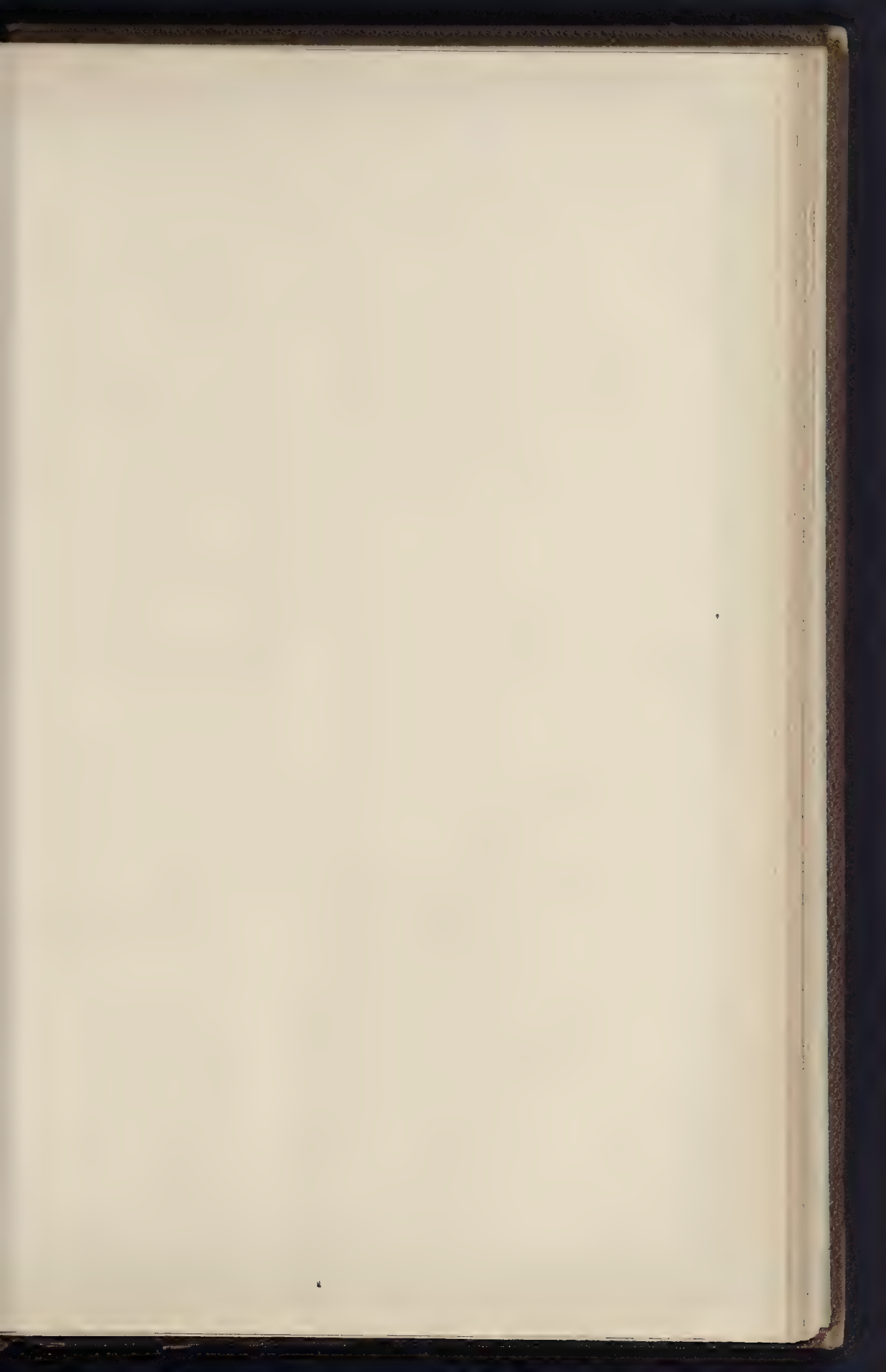


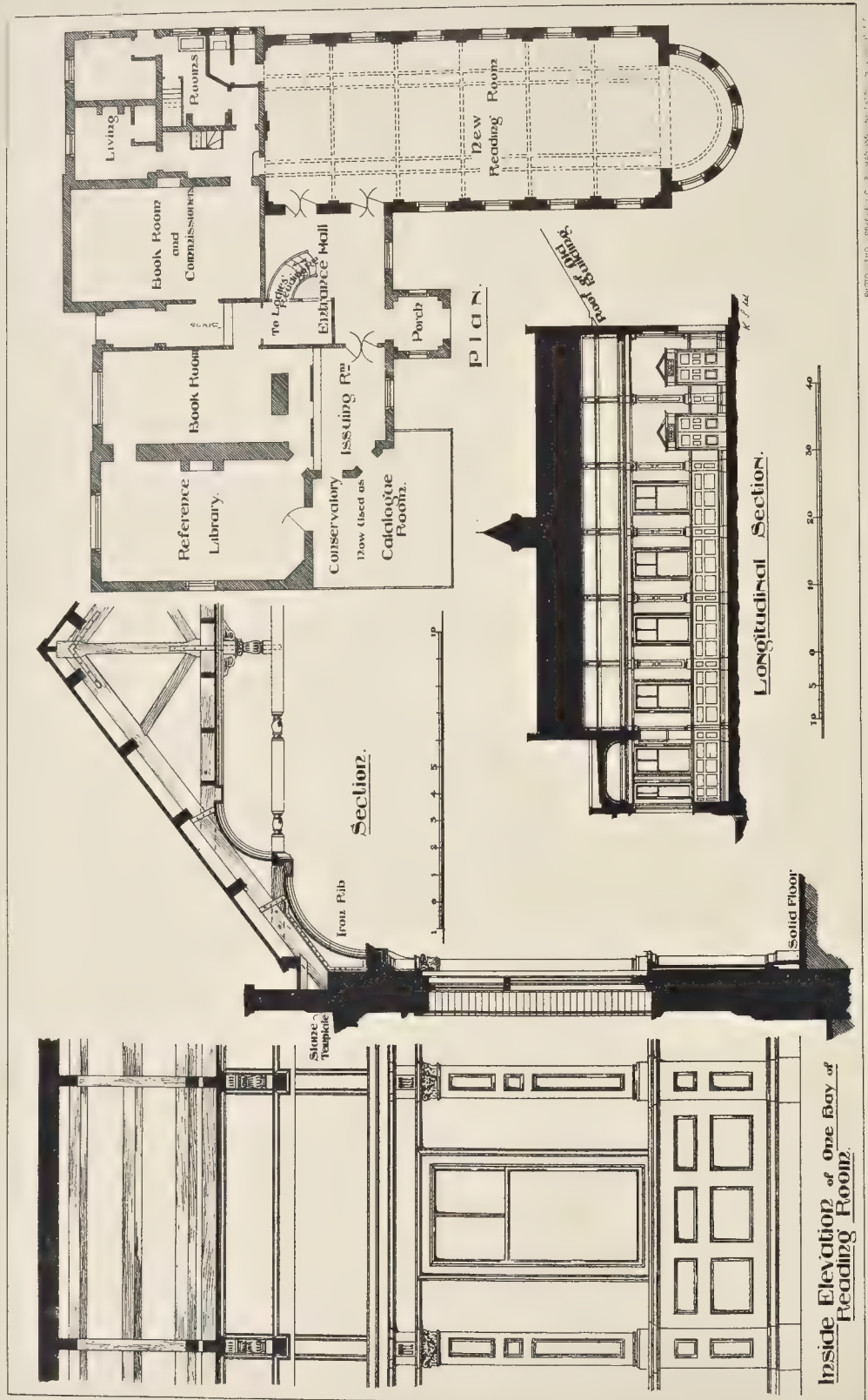
SIR RIGINALD DE COHAM, 1409  
LINGFIELD, SURREY

PHOTO LITHO SPRAGUE & CO 22 MARK LANE LONDON E.C.

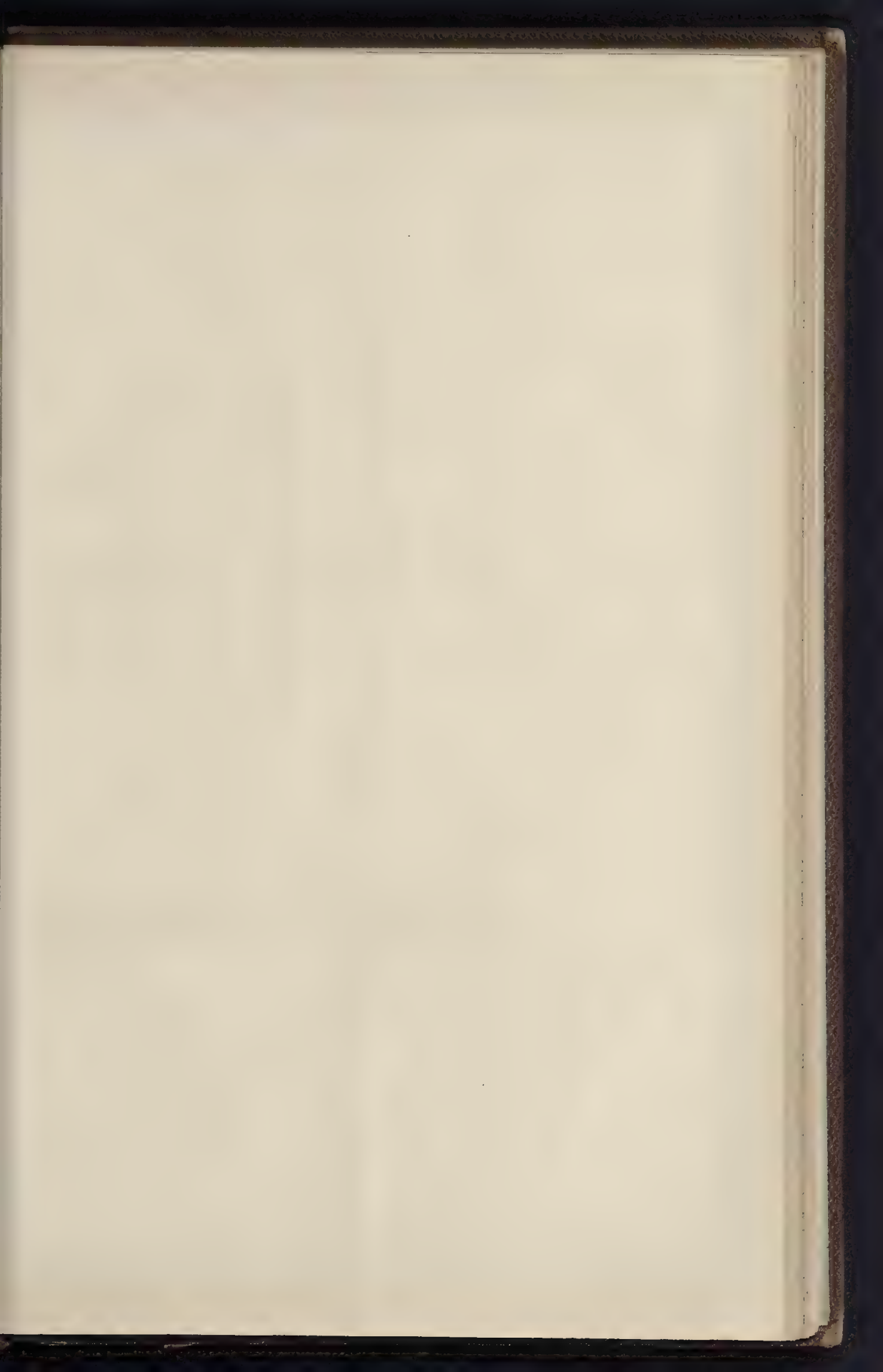














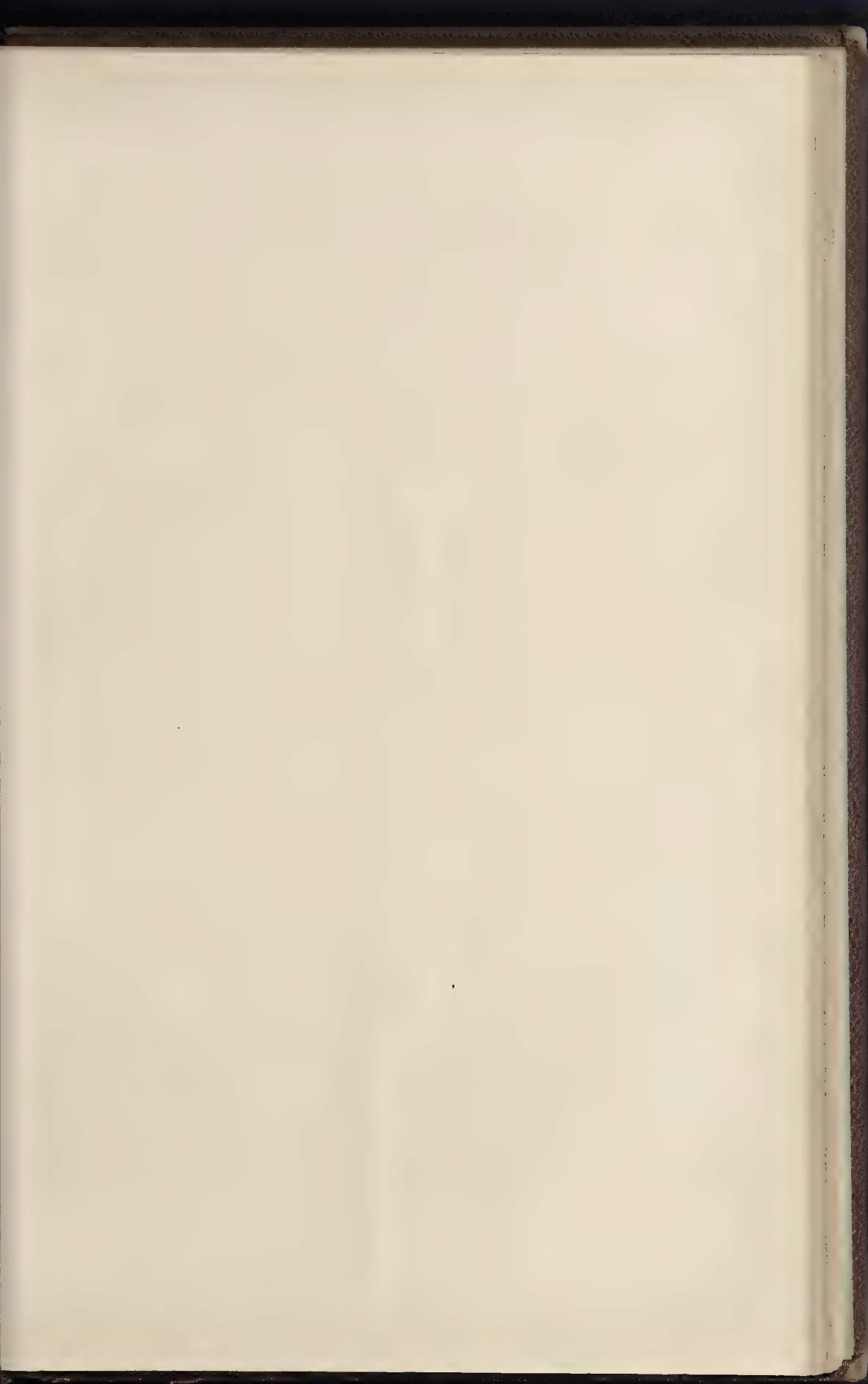
GARDEN FRONT



FRONT ELEVATION

RESIDENCE, STREET, SOMERSET.—MR. G. J. SKIPPER, F.R.I.B.A., ARCHITECT.







INTERIOR OF FIRST CLASS SWIMMING BATH :

SELECTED DESIGN FOR CAMBERWELL GREEN BATHS.—MESSRS. SPALDING & CROSS, ARCHITECTS.

MARTINS & CARROLL LTD LONDON





PHOTO SPADGUE & CO. 21, N. 1ST ST. N. Y. C.

SELECTED DESIGN FOR CAMBERWELL GREEN BATHS: EXTERIOR.—MESSRS. SPALDING & CROSS, ARCHITECTS.

















NEW READING-ROOM, WANDSWORTH  
FREE LIBRARY.

THE Wandsworth Free Library was the first established in the Metropolitan district under the Free Libraries Act. The Commissioners acquired an old house, of which the grounds had been detached for building purposes, and adapted it to receive the library. Though void of the conveniences of a new building, the success which attended it in the adapted premises was increased by the gift from Dr. G.D. Longstaff of the reading-room, which overcame the chief difficulty in the original building, —namely, the want of space for a large number of readers.

The plan shows the walls of the original building scored, and the new uses of the rooms and the plans of the new reading-room are indicated. The walls externally were faced with white Suffolk bricks, and internally with Keen's cement, with decorative features in fibrous plaster by Messrs. Jackson & Sons. The building was carried out by the late Mr. Parsons, of Wandsworth. The architects are Messrs. Roger Smith & Gale.

## LODGE AT OTFORD, KENT.

THIS is one of a series of buildings carried out by Messrs. Roger Smith & Gale for Mr. Barclay Field. The house and stables have been previously illustrated. The materials were red local bricks, Broseley tiles, and yellow deal framing, finished with pure Stockholm tar. The cost was between 800l. and 900l. The work was in this, as in the case of the rest of the work, carried out by Messrs. A. Bush & Son, of Gower-street, London, the clerk of works being Mr. James Redden.

## THE LONDON COUNTY COUNCIL.

THE ordinary weekly meeting of this Council was held on Tuesday afternoon, Sir John Lubbock in the chair.

*The Bethnal Green Slum-Clearance Scheme.*—With reference to the report of the Housing of the Working Classes Committee, presented at the last meeting, and printed by us on p. 445, ante, Lord Compton, the Chairman of the Committee, now asked leave to withdraw the report. He said that at a special meeting of the Committee on Saturday last, it was decided at the commencement of their proceedings to proceed with their recommendation, as they felt that they could easily answer most of the arguments that were adduced against it at last week's meeting of the Council. Particularly as to the statement that the price of the land in question was equivalent to something like 5d. per room, he had to say that it only worked out something like 2½d. At the end of the sitting they were informed that the other offer for this site would result in an acceptance, and in the area being partly covered by artisans' dwellings. When he brought forward the Boundary-street scheme he stated that the Committee were in hopes that they would be able without expense to re-house some of those who would be displaced. They expected at that time that one of the Gossett-street sites would be covered with artisans' dwellings; but subsequently they were told that it was to be sold for commercial purposes, and it was on that account, in fact that was the principal reason, why they brought forward their recommendation last week. As soon as they were informed that it was the intention of the gentleman who offered the site to erect cottage dwellings for the working classes to re-house about 200, they felt that the chief argument in support of their proposals had been removed, and, therefore, he asked leave to withdraw it. It was the intention of the Committee, after the recess, to bring forward a full report as to re-housing in connexion with this scheme.

The recommendation was then by leave withdrawn.

*Sky-Signs.*—The Parliamentary Committee reported that they had decided to introduce a separate Bill to prohibit or regulate sky-signs, and not to attempt to deal with the subject as part of the General Powers Bill, and recommended the Council to affix the seal of the Council to the petition for leave to bring in the Bill.

Mr. F. Harrison, Chairman of the Parliamentary Committee, said they thought it undesirable that they should promote a Bill in

which they claimed more than the public would give them. There were two points in which their definition might be more carefully guarded. One was that they ought to set forth a *minimum* of dimensions within which nothing should be considered a sky-sign, and the second was that nothing should be considered as a sky-sign unless some part of it stood higher than any actual building over which it was built. He begged leave to move:—

"That the Bill be referred to the Committee, with an instruction that the definition should be amended by adding the following provisions:—(1) To define a *minimum* measurement under which nothing shall be regarded as a sky-sign; (2) That nothing shall be considered a sky-sign of which no part stands above any part of the building on which it is placed."

Mr. Beachcroft, in seconding the amendment, said he regarded the measure as an attempt at grandmotherly legislation, only calculated to put fees into the pockets of District Surveyors.

Mr. Beck said that sky-signs were preferable to the horrible chimney-pots, and that he had seen some sky-signs which really improved the appearance of London rather than detracted from it.

Mr. Hollington said the desire of the Council was to avoid paying compensation for the removal of sky-signs. Surely the Council would not be so unfair as to say a man should pull down his sky-sign previous to its having had a reasonable life, and he did not think that six years would be a reasonable life.

Dr. Longstaffe remarked that people had been allowed to disfigure London by all sorts of abominations, and he hoped that the Council would decide, although it might seem a bit grandmotherly, that people should not only not be allowed to do that which was a nuisance and injurious to health, but should not be permitted to do that which was a nuisance to the senses of their neighbours. But for the lack of some controlling power in these matters in the past, London might have been preserved from many disfigurements.

Earl Compton said that whatever might be said against ugly and in all probability dangerous sky-signs, he hoped that flags as a means of advertisement would not be interdicted.

Mr. C. Harrison, in reply, stated that there was not the slightest objection to the Council amending the Bill. It was very easy to refer back a clause to the Parliamentary Committee to define a sky-sign, but they had had eight or ten meetings, and with the advice of the Parliamentary agent and the Solicitor and all the members of the Committee, before they came to their decision, and if the Council could define sky-signs better he was sure the Parliamentary Committee would be very glad to accept any suggestion. There were special stipulations which prevented the Bill from affecting auctioneers' advertisements of houses to let, and brewers' signs. Under the Bill provision was made for an inspection or survey of sky-signs, and the District Surveyor should grant or refuse a certificate as to the stability of the sign, and its stays and construction generally. The Council would grant a licence for a continuance of the sign on the certificate being sent to them, and the licence would remain in force two years. It might be renewed for two periods of two years each, making six years in all. The sky sign should at the end of six years be in every case removed regardless of its structural condition, and, failing its removal, summary proceedings against the owner should be taken by the Council. If the sign were wanting in stability, and were not repaired or strengthened, proceedings should be taken by the Council to demolish it. By section 4, after the passing of the Act, it would be unlawful to erect or place any sky-sign wholly, or in part above, or over any house, building, structure, street, or way.

After some further discussion, the amendment was negatived, and the recommendation of the Committee agreed to.

*The Proposed New Sludge Ship.*—The Main Drainage Committee reported recommending that the proposal to obtain an additional sludge ship, as agreed to at their meeting on October 7 last be abandoned for the present. This was agreed to.

*London Water Supply.*—The Special Committee on Water Supply and Markets reported that they had passed the following resolution, which they submitted and recommended the Council to adopt:—

"That in the opinion of the Council it is necessary to inquire whether the present sources of supply of water

are adequate to the growing demands of the population in quantity and quality, and that her Majesty's Government be requested to institute an immediate inquiry whether any and what steps should be taken to provide a new and better supply, so that a report may be made thereon in the course of the ensuing session."

The Chairman said that as he had proposed the resolution which was now recommended to the Council by the Committee, he was anxious to say a few words in its support. He had paid much attention to the subject of water supply, having served both on the Manchester and on the Liverpool Water Bills Committees of the House of Commons. He need not, however, enlarge on the reasons for doubting whether the supply of water in the Thames basin would be sufficient in quantity and satisfactory in quality for the supply of the rapidly-growing population in the metropolitan area. The memorandum of the vice-chairman, which they had all received, and the report of Mr. Binnie clearly set out the facts, as to which the Water Committee were indeed almost unanimous. The question was as to the policy. The Council, no doubt, had power under the Bill of last year to make inquiries, and indeed were doing so, but the sum to which they were restricted was not sufficient for more than a preliminary inquiry. Moreover, in this matter it was necessary not merely to convince the Council, but also the Government, and the Government would naturally attach more weight to an inquiry which they had themselves set on foot. The last words in the resolution were not in his proposal. They sounded rather peremptory, but were not meant to be so. It was certainly, however, exceedingly desirable that the inquiry should be completed as soon as possible. This recommendation had no reference to the purchase of the water companies. It would be equally desirable whether the supply of water was in the hands of the companies or of the Council. Far from conflicting with the policy adopted by the Council, it would be quite in harmony with it, because the adoption of the resolution would certainly render the companies more disposed to treat, nor would it conflict with the Bills proposed by the Vestries and the Corporation, because if the Government approved they might carry out the inquiry recommended in the resolution by means of the committee on one or other of those Bills. The resolution did not commit the Council absolutely to the statement that an additional supply would soon be necessary. It did, however, record the opinion that the subject demanded the earnest attention of Government. If the Council rejected the resolution, and if the supply in a few years proved insufficient, he feared that they would be censured for having in this respect neglected the interests of London. If, however, they passed the resolution, they should have done all that for the present they were empowered to do. They would have recorded their opinion, and the responsibility would then rest with Government. It was from this point of view that he had proposed the resolution; it gave them the opportunity of expressing their opinion, which had not yet been done, and under these circumstances he hoped the Council would support the recommendations of the Committee, and call the attention of Government to the importance of the inquiry whether in a few years the water supply within the Thames area would not be insufficient for the growing population of the Metropolis.

Mr. C. Harrison, Chairman of the Parliamentary Committee, was sorry he could not agree with the recommendation of the Water Committee. He thought the proper way of dealing with this matter was that the Home Office should be asked in Parliament to undertake to ascertain the opinions of experts as to whether the present supply was adequate, and, if not, where a new supply was to come from. If a Government Department undertook that, they would instruct experts to do it properly and would pay the expenses, and they would have a proper report. He did not think the question would be at all carried further by a Royal Commission or a reference to a Parliamentary Committee and a number of engineers saying they thought this might be done, and that such a supply might come from the Chiltern Hills or some other place, without the actual physical investigation.

The Vice-chairman (Sir Thomas Farrer) stated that the Committee did not think it right in framing this resolution to dictate to the Government the actual form the inquiry should take. There were not only engineering questions, but semi-political questions,—questions



of the rights of other bodies, and questions of other consumers of water. No doubt the engineering question was a primary and difficult one, and it would be open to the Government, if they were pleased to accede to their views on the subject, to appoint a special commission of experts. They thought it far the wisest thing in this large concern, in which he might say they felt the Government must be interested and must take part, most respectfully, of course, to ask the Government to make an inquiry, leaving them to judge of the best way in which the inquiry should be conducted.

The recommendation of the committee was ultimately agreed to, and after transacting further business, the Council was counted out at five minutes before seven o'clock.

#### THE ASSOCIATION OF PUBLIC SANITARY INSPECTORS.

At the opening meeting of the new session of this Association, held at Carpenters' Hall, the new president of the Association, Dr. B. W. Richardson, delivered his inaugural address. There was a large attendance of members and visitors, among them being:—Dr. Danford Thomas, and a number of ladies. Mr. H. Alexander (Shoreditch), Chairman of the Council, opened the proceedings, and subsequently ceded the chair to Dr. Richardson. The address, which was extemporised throughout, commenced with an interesting historical contrast, in which the conditions of life in the eighteenth century were compared with the enormously improved conditions of the present period of the nineteenth, and concluded with the enumeration of the leading sanitary reformers of former times, and a sketch of the career of the last and greatest of them, the first President of the Association, the late Sir Edwin Chadwick. Medical opinion in the earlier of the two centuries was so little enlightened that even the profession often regarded the entrance of that dreadful malady—small-pox—into a family as a good thing because it was inoculation, and therefore a safeguard against future attacks. The treatment of the insane, even in the case of persons wealthy enough to pay for proper treatment, was systematically cruel. Now the poorest inmates of asylums received better treatment than even kings or princes could then command, and the insane were frequently chained up in outhouses or cellars, like wild or savage animals. The death-rate, or rather the life-rate, the expression that he now preferred, might properly be called the pulse of the people. In a review he had set down the normal death-rate for England at 12·5 per 1,000 and the maximum at 15 per 1,000, but that very morning, as if providentially, he had received information from Hove (Brighton) of a rate reduced to 10·4. Even in the army, including that of India and other distant possessions, the rate, which last century was as high as 68 per 1,000, had now been reduced to 16 per 1,000. Such a death-rate as prevailed at the beginning of this century, even in towns considered fairly healthy, would create a panic if prevalent in any town now, and any such town would now be shunned as a plague spot. His picture of Hygieopolis had been considered so overdrawn and impossible that it had been called a mere poem, but sanitary improvements were progressing at a rate which promised to make his elevated gardens of London realities before the end of the present century. Before treating of the "Sanitary Reformer" who was the principal subject of his address, Dr. Richardson enumerated the leading sanitarians of previous periods, commencing with that encyclopedic philosopher, Sir Francis Bacon, the great Lord Verulam. In Italy Dr. Ramazzini, and in England Dr. Arbuthnot were the greatest reformers, followed in Scotland by a remarkable man, Dr. Benjamin Bell, who, with other merits, must be credited with being the first to propound the principle of Free Trade. Dr. Priestley, by his demonstrations of the properties of fixed air, and Dr. Pringle by his great army reforms, had subsequently carried on the knowledge of sanitary science in the last century, but it was to the new century that the greatest perhaps of all the sanitary reformers belonged, Sir Edwin Chadwick, their late venerated President. Dr. Richardson narrated the circumstances under which he had in 1852 first met Mr. Chadwick, then a barrister,

whose interference in questions of health earned for him a certain amount of dislike in the medical profession. He declared that, although so unlike in many respects, their late President and himself had always been in agreement on leading principles, and that throughout a long and close intimacy they had never had a personal disagreement. Among the long list of reforms on which the influence of Mr. Chadwick had been the most powerfully felt, were those of workhouses, registration, graveyards, and the dwellings of the working classes,—but he had been the first to suggest a great number of the most beneficent movements of the present and the immediate future, including coffee palaces, public promenades, baths and wash-houses, model lodging-houses, and cremation, and, although he was not a teetotaler, he had conceived a broad-minded scheme for a Permissive Bill. Sir E. Chadwick's proposals for "workhouse reform" had been greatly misunderstood, and the misrepresentations made had brought him into undeserved obloquy. The term "Union" was invented by him for a purpose totally different from that to which it had been since applied. His scheme of "Union Workhouses" was a splendid conception, and had it been realised in its entirety it would have given us fifty years ago, under one and the same state organisation, not only the "workhouse," but the "almshouse and the industrial school," and a group of such institutions as have since been created by voluntary effort. Mr. Chadwick had originated the regular registration of births, deaths, and marriages, and had discovered that greatest of Registrars-General, William Farr. His "Report on the Condition of the Working Classes" was a monumental work, which he brought out at his own risk. The revolution in the rites of burial which had taken place in the latter half of this century was initiated by his work on graveyards and cemeteries. He was an earnest advocate of the doctrine contained in Ward's formula, "the sewage to the soil, land to land, and water to water." Even his last notion, that pure air should be brought through the clouds by long tubes, was worthy of the most vigorous of youthful minds; instead of being, as it actually was, the conception of a man of eighty-seven. To sum up, Mr. Chadwick held that the one word "cleanliness," if properly understood, included all that was meant by such scientific terms as "antiseptics" and others of recent invention.

The address was frequently interrupted by applause, and at its conclusion a vote of thanks was accorded to the new president on the motion of Mr. Richards (Battersea), seconded by Mr. Fairchild (Clapham).

At the second meeting of the Association, held on Saturday last, an address on "Cremation as a mode of disposing of our dead" was delivered before the members of this Association, with Mr. H. Alexander in the chair, at Carpenters' Hall, London Wall, by Mr. J. C. S. Hanham, the Hon. Sec. of the Cremation Society of England. The usual arguments against the customary modes of burial were cogently presented by the lecturer, an interesting experiment made by M. Pasteur being cited, among other proofs offered, in support of the declarations of Dr. Parkes and other sanitarians of the highest authority, that the vicinity of a grave-yard was always an unhealthy district to live in. The great French scientist proved the existence of morbid germs in earth, beneath which a cow had been buried, by an inoculation experiment, every one of a number of guinea-pigs inoculated with earth taken from above the buried cow dying after inoculation, while of an equal number similarly inoculated with ordinary earth not one failed to recover. The best and most economical way of destroying such germs was by fire,—a test which they were unable to survive.

A discussion followed, in which Mr. Alexander, Mr. Wootton, Mr. Richards, Mr. Middleweek, Mr. Tidman, and other members took part, in the course of which objections on the score of cost in time and money were urged against cremation. A vote of thanks was accorded, in replying to which the lecturer answered the principal objections offered. The cost of cremating a body was at present as much as 6*l.*, but that was because the cost incurred was almost as much upon the fifty bodies per annum now disposed of in that way as it would be on three thousand. On the latter number the cost would not exceed half a guinea per body. There would also be a great public saving in the cost of sites for cemeteries if cremation became customary.

#### THE PLUMBERS' COMPANY.

On Monday evening last the Master, Wardens, and Court of the Worshipful Company of Plumbers, entertained a large company at dinner, the guests including a large number of gentlemen who have interested themselves in the promotion of the movement initiated by the Company some years ago for the education and registration of plumbers.

The Master (Mr. W. H. Bishop) submitted the toast of "Modern Sanitary Science and Technical Education," and in speaking of the efforts put forth by the Plumbers' Company, said the scheme involved a training for apprentices in the technical schools and colleges, some of the Principals of which he was very pleased to see present that night. A scheme had been prepared, and a syllabus of instruction issued to men who had passed through apprenticeship in order that the principles of science and the practice of plumbing might be improved. He coupled with the toast the names of Sir Bernhard Samuelson, M.P., Dr. Robert Farquharson, M.P., and Professor Garnett.

In replying, Sir Bernhard Samuelson congratulated the Plumbers' Company upon the great advance they had made with regard to the question of technical education.

Dr. Farquharson expressed a hope that in the future sanitation would permit of a man living 100 years to enjoy the good health which modern sanitation offered to every man.

Professor Garnett, responding, said the nation was indebted to the ancient guilds of London for having had been done in the promotion of technical education, and to none more than to the Plumbers' Company.

The Master then gave the toast of "The Municipal Corporations of Great Britain and Ireland," and, in doing so, he said what the Plumbers' Company had promoted was a union of masters and operatives, and he was not aware that this had been so successfully effected in any other large trade. This was a volunteer system of registration, based upon the best of qualifications, which, he thought, was the only one in which the co-operation of all authorities could be secured throughout the country. The movement had been generally responded to, because the health of the community depended upon the result. The President of the Local Government Board was one of the first to recognise the importance of the movement, and a circular was issued by the Plumbers' Company at his express suggestion, and this circular met with the ready support of all the County Councils. During the year they had held 123 meetings, and he believed that he might say that 200,000*l.* would be spent in economic and sanitary schemes, subject to the approval of the Attorney-General, and they had some hope that this would be supplemented by other contributions, and that it would be ultimately available for the promotion of an educational scheme which would be given to the whole of Great Britain and Ireland. He associated with the toast the names of the Mayor of Manchester and Mr. Ex-Bailie Crawford.

The Mayor of Manchester and Mr. Ex-Bailie Crawford having acknowledged the compliment,

The Lord Mayor proposed "The Health of the Master of the Plumbers' Company." He said it would be impossible for a livery company to take up such a great work without its possessing a good Master at its head, and he was sure the Plumbers did possess a very excellent Master. He hoped there might be held in the City of London a congress on hygiene, and he could assure them, if it was held, it would have his heartiest support, and he was certain he would receive the greatest assistance from the livery companies of the City.

The Master briefly thanked the company, and gave the toast of "The Guests," to which Sir E. Sieveking and Mr. G. Galloway responded.

PROPOSED IMPROVEMENTS IN THE ISLE OF MAN.—At a sitting of the Tynwald Court in Douglas, on the 25th ult., the petition of the Douglas Town Commissioners for leave to borrow 4,000*l.* for the erection of a public abattoir was presented and referred to a committee to report on the question of a site. The report of the committee of the court respecting the swing-bridge over Ramsay Harbour and further improvements on the Mooragh estate was presented. The Town Commissioners of Ramsey ask for further aid of 12,000*l.* The committee reported generally that it appeared essential that the works should be carried out, and that the borrowing powers to the extent of 14,000*l.*, instead of 12,000*l.*, be granted, making the total indebtedness nearly 55,000*l.*

BYGONE NOTTINGHAM.—Mr. T. C. Hine, the well-known Nottingham architect, sends us a copy of a lithograph sheet from his drawing (made we presume for private circulation), in which he has brought in a kind of general view a number of bits of old Nottingham which have now disappeared: the old guild hall, the market cross, the old bridge over the Trent, &c.; the whole including twenty-eight relics, mostly architectural. They are compiled from former sketches by the author, and from illustrations by Speed, Deering, Sandly, and others. The names of Nottingham worthies are worked into scrolls on the ornamental border.



## Correspondence.

To the Editor of THE BUILDER.

## MR. WATERHOUSE AND THE ARCHITECTURAL ASSOCIATION.

SIR,—I have seen, with some surprise, that Mr. Waterhouse's statement that the new education scheme in its entirety was not adopted by the general body of members, has met with some challenges.

The proposals were put before a meeting not by any means full, and were not all adopted unanimously, while subsequent meetings proved that there was a growth of feeling on the subject, which rendered it impossible to carry out the scheme without modification.

The Committee that has just been sitting was not appointed for the purpose of giving effect to the scheme, but to act more as a conciliatory body to further consider the proposals, especially as there had been such a strong expression of opinion on the advisability of affording means to consult the general body of members in any changes of a drastic nature.

I take it that Mr. Waterhouse's view will be accepted as more correct than those of the partisans of the "curriculum." A. NEDHAM WILSON.

## BARRETFRETON CHURCH, KENT.

SIR,—In the *Builder* of the 5th, you state "There is a curious semi-Celtic appearance about some of the ornaments which seem to indicate some special influence at work in the erection of this church, which has this other notable feature, the curious irregularity in the setting out," &c., &c.

This latter peculiarity is very characteristic of Roman work.

Was the original production Romano-British? With regard to the stringing of things, the fret, and the patera ornamentation, they, too, are of that school.

Of the latter ornament, I remember seeing something very similar at the Roman villa at Torkington, Gloucestershire; and I enclose a tracing of a rubbing from a small piece of string moulding in Parbeck marble, found in the excavation of the Basilica at Silchester some years ago.

Bath, December 8, 1890. RICHARD MANN.

## BRIDGE CHAPELS.

SIR,—With reference to this interesting subject, lately discussed in your columns with illustrations from these mediæval structures, I would like to refer those students in this branch of archaeology to the "Calendar of Wells," printed in the Court of Hustings, London, recently edited by Dr. Sharpe, of the Town Clerk's office, and published by the corporation of the city.

In Part II. of this volume are numerous particulars of the wills of London citizens, and many items of the bequests given for the maintenance of St. Thomas's Chapel on London Bridge, especially as to the keeping up the chantry in the same building.

These entries range in date from 1368-1688, so that a wide area is introduced, and the variety of bequests made with frequent mention of old (and now destroyed) churches, affords many a clue to the searcher for the past architectural wealth of old London.

Though naturally the documents are drawn from civic sources, still frequent mention is made of repairs and preservation of ancient bridges elsewhere, and where existing, of the chantry chapels founded on or near them. Surely the annalistic side of architecture is much enriched by such publications as the above.

S. W. KERSHAW, F.S.A.

## BRICK-BURNING.

SIR,—I assumed that my letter on this subject would only be of interest to brickmakers, and did not go into details, and, with your permission, I would like to reply as briefly as possible to the very fair and moderate letter signed "A Brick-maker."

Clamp bricks are burned with breeze and ashes; the first is used in layers in the clamp, the latter being introduced into the body of the brick itself, by being spread over the brick earth that has been dug and cured up, or washed into a back, as the case may be; when used the temperers cut down the face, and it is mixed in the pug-mill.

The breeze and ashes are procured as follows:—Dust-bin refuse is collected, bulky items are picked out, and it is then screened—the coarse is the breeze, the fine is ashes—it goes through no other process, and it is perfectly obvious that the fifth will go through the screen as easily as the ashes. It is this fifth that, when burnt, causes the stench.

I say that the clamp brick is doomed if the new by-law is enforced, because the present system of burning cannot be continued without causing a nuisance; if the by-law is not to be enforced, why unduly harass a trade; competition is severe,—I

notice bricks made in Belgium being used in London, for both house building and street works. A properly-burnt brick, whether clamp or kiln, is imperishable; underburnt bricks, on either system, will not stand, and should only be used for interior work (if at all).

The bad kiln bricks referred to are probably such, or may be semi-dry bricks—these, unless made from suitable clay, will not stand at all.

I consider that both clamp and kiln bricks are burnt, the former partly by heat from the layers of breeze, but principally by the fuel in the brick; and the latter by the application of heat from coal fires applied to the outer sides only. Kilns when burning give off the gases and products of combustion from the coals, and very little of that if in competent hands. There is nothing injurious in this, or in the bricks themselves. It is the filth, that cannot be separated from the breeze and ashes, that causes the trouble.

I know full well what is embarked in, and dependent upon, the trade. Many of my friends say that they have not heard of the proposed by-law, and it seems to me altogether wrong that a law having such serious and far-reaching effects, should be passed (as far as I can learn) without any proper inquiry into the rights and wrongs of the matter.

However, one thing is certain, you may down a system, you cannot stop the trade. London has been, is, and will be a city of brick; and bricks and brickmakers will be wanted in ever-increasing numbers. It is simply a question of burning on a different system, for the sake of the public health. With the remarks as to compensation, and the last paragraph of your correspondent's letter, I heartily agree.

JOS. JOPLING.

## "DEATH TO IMPERFECT VENTILATORS."

SIR,—Mr. Buchan's letter in your last doubtless refers to me, although my name is misspelt,—probably through indistinct handwriting,—which thus exhibits a parallel with Mr. Buchan's arguments.

I have no time for long letters, not yet having arrived at the stage of "cultured leisure." So I must simply say:—

1. I have never, under any circumstances or at any time, advocated the use of valves in fact, a manner as to produce syphonage. In fact, I have never once mentioned soil-pipe ventilation in connexion with any valve. I do so now.

2. Exit valves may be used to distinct advantage on soil-pipes, and without causing syphonage.

3. This distinct advantage necessitates a radical deviation from the lines laid down by Mr. Buchan.

The above are direct contradictions of Mr. Buchan's statements. I may go further, and say he never invented a closely-fitting exit-valve such as mine, and I call upon him to indicate where one such is patented, or where one such of his manufacture is in use.

The kind wish expressed by him that my ventilator should be withdrawn from the market is so disinterested and unusual, as coming from a rival ventilator maker, that I hasten to thank him, and "refer his kind recommendation to the proper quarter."

J. F. SIMMONCE.

Liverpool, December 4, 1890.

## THE COMMUNION TABLE.

SIR,—The recent judgment of the Archbishop of Canterbury will have drawn the attention of those who have read it to the fact that there was a period when the altar was replaced by a table standing east and west within the chancel, and sometimes within the nave, of our parish churches. Some years ago an oak table in a very decayed condition came into my possession, and I was informed that at one period it had stood in a church in Westmoreland. It is of good design, and may be seventeenth century, or even sixteenth century, work, but had the peculiarity that its legs are of two different patterns, and that they were placed in pairs at the two ends. That is to say, the legs at one end were handsomer than those at the other end. This unusual peculiarity can be understood if the table was to stand so that the congregation would habitually see its end, not its side, and is, I think, sufficiently curious to justify me in asking you to find room for this brief notice of it. Was it customary?—T. R. S.

## FUNGUS.

SIR,—Can any of your numerous readers inform me how to destroy "fungus" (in an old brick wall), the growth of which has completely rotted a set of door-jamb which have only been fixed a little over a twelvemonth? I had the jambs well painted before they were fixed, and the brickwork well "dressed" with hot lime.

AN OLD SUBSCRIBER.

GRADIENT INDICATOR.—We have received an illustration and description of "Brown's Automatic Self-adjusting Gradient Indicator," the principle of which consists in a curved spirit tube in which the bubble remains stationary at a point in the index marking the angle of the surface on which it is resting. We have not, however, had any opportunity of testing the instrument.

## The Student's Column.

## HOT-WATER SUPPLY FOR BATHS, LAVATORIES, &amp;c.—XXIV.

## SAFETY VALVES, &amp;c.

HERE are at present but four kinds of safety valves made for range boilers, viz., spring, dead-weight, lever, and diaphragm.

The spring valve, shown in section at fig. 62, is, perhaps, the one mostly used owing chiefly to its occupying, but little room; it consists of an outer case A, a screw cap B, pin C, seating D, and a spiral spring.

The seating is held in place by the spiral spring which presses upon it at one end and at the other end against the screw cap; this where the utility of the screw portion of the cap manifests itself, as by unscrewing the cap we slacken the pressure exerted by the spring, and by screwing the cap down the spring exerts a greater force. The seating has the under side of it covered with a special compound of a rubber character so as to easily effect a water-tight joint, and the outer casing is perforated to allow of the ultimate escape of the steam when the seating is lifted.

When fixing these valves, and the apparatus is charged, it is usual to unscrew the screw cap until the valve leaks, then screw it up again until the leakage ceases, and afterwards give it one extra turn to keep it quite sound under ordinary conditions.

Undoubtedly, the proper place for a safety-valve is in the boiler, but it is very desirable to have the valve in sight, and this precludes the idea of having it fixed directly into the boiler itself; therefore, the next best arrangement is to have it fixed somewhere in sight, and connected directly with the boiler by a fair-sized pipe; there is no great risk of this pipe becoming stopped, not even by fur, as the water does not circulate within it, and if it is taken from the top surface of the boiler, there is not a great likelihood of the opening to the pipe being "furred" up, unless the boiler is allowed to get into a very bad state indeed.

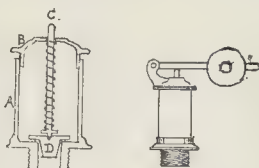


FIG. 62.

FIG. 64.



FIG. 63.

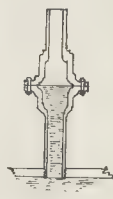


FIG. 65.

There is an idea rather prevalent that as good a place as any for the safety-valve is on the cylinder (of the cylinder system). No doubt the advocates of this method have strong arguments in favour of it; but it must be borne in mind that cylinders never burst. It is the boiler that is the seat of danger, and where the pressure is exerted to the greatest extent; and, what is more, some of the accidents are due solely to something that occurs between the boiler and the cylinder—stop-cocks, for instance.

It was said just now that cylinders never burst—neither do they; they collapse, which is a very different thing, and which a safety-valve would in no way obviate, as the valves in question are provided expressly to relieve a pressure



that is exerted from the inside, whereas a cylinder collapses from an external cause—viz., atmospheric pressure, and an inlet-valve would be the proper thing to obviate this.

The collapse of cylinders is of as great a rarity as the bursting of boilers, and it is brought about usually in this way:—Supposing a cylinder for some reason is allowed to get empty, and a fire is still kept in the range (a most unlikely thing), if there is any water in the boiler this will boil, and the steam will, of course, enter the cylinder; now it is well-known that there is no better means of driving air out of any confined space than by injecting steam into it, and consequently while the steam is entering the cylinder in fair volume, very little air will remain there. While things are in this condition, if cold water is introduced the steam is condensed, and a vacuum is formed, when the pressure of the atmosphere crushes in the cylinder like cardboard. It takes but little calculation to arrive at the force exerted by the atmosphere, as we only have to find the number of square inches on the external surface of the container and multiply by 15 to have the total pressure in lbs. With a medium-sized cylinder this pressure would be about 15 tons.

The next form of safety-valve in general favour is the "dead-weight," as fig. 63. The body of the valve is similar in form to the one last described, but the seating is held down by weights placed and bearing upon the central pin. This is a good valve, but unfortunately takes up a good deal of room, and is not of slightly appearance, otherwise it is to be recommended on the score of reliability. This valve is still more unsuited to place directly into a range boiler, but it can be connected by means of a pipe, as described with the last. After it is fixed sufficient weights are placed on to just prevent leakage, then an extra weight is added to keep it quite sound under ordinary conditions.

Next in rotation comes the lever valve, as fig. 64, this is similar in internal construction to the two preceding, but the pin which bears upon the seating is held down by a weighted lever above, as shown; this is another reliable valve, but is even more cumbersome and unsightly than the dead-weight, consequently it is rarely seen affixed to range boilers, but it is a valve that must be familiar to every one, as it is much used on all sorts of steam boilers. It is a very safe valve.

The last to be described is an arrangement by which an excessive pressure bursts a thin sheet of copper, thus releasing the undue strain. Fig. 65 illustrates this valve. As the thickness of the copper must be proportional to the pressure on the boiler, it is necessary when ordering these to state what pressure of water exists, or, in other words, how far the cold-water cistern is above the boiler, and the maker inserts a diaphragm of suitable strength or lightness. Should the valve come into operation, it can easily be put in order again by the mere insertion of another diaphragm.

Fusible plugs are, perhaps, the most ingenious form of safety-valve ever introduced, but, owing to certain drawbacks, exceedingly difficult to overcome, they are not used as freely as they would otherwise deserve to be. A fusible plug, as its name implies, is a plug or piece of material arranged to be fitted in the boiler in such a manner that, although infusible at the temperature of boiling water (212 deg., or thereabouts), it would immediately melt if the boiler was without water, and by its melting leave an aperture for the free escape of steam, should water afterwards flow in, and so prevent an explosion and disaster.

These plugs are pieces of soft metal, usually a disc, enclosed in a brass or gun-metal socket, this socket being screwed inside the boiler (to prevent injury by the poker or stoking tools), and it is further made so that part of it is easily removable to replace the plug, when it may require renewing.

These plugs, however, can not only be used as an element of safety when danger from shortness of water arises, but, if properly made, will answer the purposes of a safety-valve when any dangerous symptoms arise with a full boiler, in the following way:—When a hot-water apparatus is working under normal conditions, with the expansion and cold supply pipes open, it may be assumed that the water does not ever reach a higher temperature than 212 deg., this being the boiling point at sea-level, where the pressure of the atmosphere is 15 lbs. to the square inch. If by any means the two pipes just mentioned become tightly closed, the atmospheric pressure will not regu-

late the boiling and consequent temperature, and before we have an explosion it is probable the pressure exerted in the apparatus will be 100 lbs. to the square inch, this pressure permitting the water to have a temperature of 330 deg. (approximate). This fact is utilised by making the fusible plug of an alloy (bismuth, &c.) that will melt at, say, 280 deg.—the superheated water will then effect its fusion and the approaching danger be obviated. This, however, as will be clearly understood, needs the plug to be most carefully made if it is to be relied upon.

The great objection to the fusible plug, in the South of England, is the "fur" deposit from hard waters. If the plug gets even a thin coating of this material it must suffer, as the deposit being a low conductor of heat, the water is prevented from absorbing the heat from the plug as fast as it receives it from the fire, and under these circumstances it will be found that the plug will more frequently fail when no danger is to be feared, than the reverse. With soft water there is no objection to be raised, but notwithstanding this, fusible plugs have never gained favour, and are most commonly used as auxiliaries to ordinary valves, or to meet some special condition that may exist.

#### SURVEYORSHIPS.

PERTH.—At a meeting of the Perth Police Commission, held on the 8th inst., Mr. Robert McKillop, of Messrs. Cunningham, Blyth, & Westland's, civil engineers, Edinburgh, was appointed Burgh Surveyor and Superintendent of Works and Drainage for the city, at a salary of £175.

ST. HELENS.—At the last meeting of the St. Helens Town Council, it was decided to grant the Borough Engineer, Mr. Geo. J. C. Broom, Assoc.-M.I.C.E., the sum of 100l. for extra works carried out by him during the past year, principally the erection of the new public baths, just completed, at a cost of 10,086l.

#### GENERAL BUILDING NEWS.

THE PERSE SCHOOL FOR BOYS, CAMBRIDGE.—The new buildings for the Perse School for boys in Cambridge were opened on the 4th inst. by the Mayor, and a banquet was given in the great hall by the Chairman of the Governors, the Master of St. John's College. The school is a first-grade school, and at present has about 200 boys. The new buildings are calculated to accommodate between 300 and 400 with ease. The general plan of the school-buildings is that of a large hall with twelve classrooms grouped on the north side of it. The hall is 77 ft. by 37 ft. 6 in., and 25 ft. to the wall-plate, and it has an open timber roof. The classrooms are each 24 ft. by 20 ft.; those on the ground floor are 13 ft. high, and those on the first floor are 15 ft. high to the collar. Beside the above classrooms there are head-master's and assistant-master's rooms, a large entrance-hall and board-room, and all the necessary lavatories and out-buildings. The lodge is a small building at the gateway, calculated to accommodate a porter without family. The general style of the building is that of the end of the seventeenth century. It is built with red bricks, and the roof covered with red tiles. A lofty bell-cot rises from the centre of the hall roof. The entrance doorways and the gables are finished with red terra-cotta, and the windows have timber frame work, painted white. The architect is Mr. W. M. Fawcett, of Cambridge, and the builders were Messrs. Kerridge & Shaw, of the same town. The total cost has been about 7,200l.

THE NEW OLYMPIC THEATRE was opened last week. Last year, Mr. Charles Wilnot bought the old building, demolished it, and has since erected the new theatre for Mr. Wilson Barrett, now lessee, on the designs of Messrs. Crewe & Sprague, of Fitzalan House, Arundel-street, Strand. The style of the decoration is Louis Seize, and it has been carried out by a Parisian firm. The tableau-curtain and the stalls, both in rich silk plush, the velvet seats in the dress-circle and upper boxes, and the upholstery generally, have all been done by Messrs. Oetzmann & Co., of Hampstead-road, and are of the tint known as "Rose du Barry." The house is lighted by both electricity and gas, the former installed by Mr. H. South.

NEW PREMISES, WALSALL.—Some new buildings have just been completed at the junction of Lichfield-street and Bridge-street, Walsall. The buildings comprise five shops, and also rooms used by the Literary Institute. The chief shop is occupied by Mr. Draycott, in the basement of whose premises there is a packing-room, framing and gilding shops, store for residuals, heating apparatus, and fuel-store. On the ground-floor is a retail shop and frame-making shop. The first-floor comprises a reception-room, a panelled ceiling picked out in colours, panelled and moulded dado, walnut chimneypiece, &c. On this floor there is also a private office. The second-floor is lighted by means

of a stained-glass ceiling-light. On the left are dressing-rooms, and on the right a studio, at the back of which are enlarging, dark, re-touching, spotting, negative, and stock rooms, also lavatory, &c. On the third-floor are situated the printing, drying, sensitising, toning, stock, and artists' rooms. The building, which is in the Queen Anne style of architecture, is treated in red terra-cotta with a sea-green slated roof, surmounted with ornamental iron cresting. A separate staircase, for the use of the employés, has been provided. The contract has been carried out by Messrs. Bradney & Co., of Wolverhampton, from the designs and under the superintendence of Mr. F. E. Bailey, A.R.I.B.A., Walsall.

NEW POST-OFFICE, DUNFERMLINE.—A new post-office, erected by the Government in Queen Anne-street, Dunfermline, was formally opened on Monday. It has been built from plans by Mr. W. Wybrow Robertson, of H.M. Office of Works, Edinburgh. An improved system of ventilation has been introduced by Messrs. Baird, Thompson, & Co., ventilating engineers, Glasgow, their "Grabtrix" exhaust ventilator being used for the extraction of the vitiated air.

NEW SCHOOL FOR HULL.—The ceremony of laying the foundation-stones of a new Grammar School for Hull was performed on the 4th inst. The site is in Leicester-street, and the design for the new schools has been prepared by Messrs. Smith & Brodric, architects, of Hull. The building will have an elevation of red brick and stone dressings.

BLACKPOOL SOUTH SHORE PIER AND PAVILION. The proposed new pier and pavilion for Blackpool South Shore will, it is anticipated, fulfil a long-felt want of the residents in and visitors to South Shore. The total length of the pier is about 340 yards, the pier promenade having a width of 45 ft. The pavilion structure, which will be capable of seating 1,850 persons, will be situated about 200 yards from the shore end of the pier, and is designed in the Byzantine style of architecture. The building will be rectangular in plan, and the roof will have a curved outline. Small ornamental cupolas emphasise the angles of the main building, larger cupolas surmounting the whole structure. Encircling the main building will be a low colonnade or verandah, and the band kiosk will be situated behind the pavilion at the end of the pier structure. The architect for the entire superstructure is Mr. J. D. Harker, A.R.I.B.A., of Manchester; Mr. T. P. Worthington, engineer, of Blackpool, being responsible for the substructure.

NEW MARKET AT HALIFAX.—The Markets Committee of the Halifax Corporation are preparing a scheme for a new market on the present site, between Southgate and Market-street. Much property in that neighbourhood and Corn Market has been bought by the Corporation. The streets are being widened, and a new one—or rather an arcade—will be formed from Old Market to the Market. There are to be about 100 stalls in the covered area, the market and some fifty butchers' shops, and 40,000l. or 50,000l. is the estimated cost of the scheme.—*Leeds Mercury.*

TETBURY CHURCH RESTORATION.—The restoration of the tower and spire of Tetbury Parish Church, Gloucestershire, is about to be undertaken by Mr. W. H. Yatman, of Highgrove. Messrs. Waller & Son, of Gloucester, are the architects.

LUDLOW PARISH CHURCH.—The Lady Chapel of this church is now being restored under a scheme prepared by the Charity Commissioners for the management of a legacy of £2,000, by Messrs. A. J. Nightingale. The stained-glass window is being renewed by Messrs. Hardman, of Birmingham, at an estimated cost of 630l. The stone tracery of the whole of the windows, together with the ashlar work of the exterior, is also being restored by Mr. Thompson, of Peterborough, at an estimated expense of 580l. During the work, an old priest's door has been discovered, and some carved Early English tracery and the old tile pavement of the fourteenth century have been exposed.

RUDINGTON CHURCH, PEMBROKESHIRE.—The Church of St. Michael, Rudington, is to be restored by Mr. Reginald G. Pinder, F.R.I.B.A., of Bournemouth, the architect appointed by the restoration committee. It is one of the oldest churches in the county, and possesses many interesting features. It is stated to be at present in a very bad state of repair.

OPENING OF A NEW CHURCH IN THE GAW VALLEY.—A mile to the north of Pontycymer Station lies the little town of Blaengarw, and at this place a new church was consecrated on the 8th inst. by the Lord Bishop of Llandaff. The church is a stone building of cruciform plan, and in plain Early English style. The nave is 61 ft. by 28 ft., and the chancel 22 ft. by 19 ft. 6 in. There is also a vestry and an organ-chamber, spaces being left on the north side for extra accommodation—the present being for 300. The ground woodwork is all of pitch-pine, and the roofing of stained red deal. The building is heated by hot air on Perrett's system. The contract price was £1,055l. The architects were Messrs. Brind & Williams, Cardiff and Barry Dock; and the builder Mr. John Rees, Ynysybwl. The site was given by the Earl of Dunraven.



**RE-OPENING OF TICEHAM CHANCEL.**—The chancel of the parish church of Ticeham, Somerset, has just been re-opened after complete internal renovation and restoration, under the supervision of Mr. Ewan Christian, the work being carried out by Mr. W. A. Green, contractor, of Clevedon. The plaster, which had been coloured with a blue wash, has been removed, and the plain stone laid bare. The floor has been raised to its former level, and paved with Godwin's encaustic tiles. New oak seats have been supplied, and the levels of the windows lowered and made even, the side windows being filled with tinted glass. In the course of restoration, interesting discoveries were made of a very large hagiocope, opening out into the north aisle and giving a full view of the altar, and a slab under the former wood pavement of the sanctuary, bearing an inscription. The approach to the roof was opened out, disclosing six steps in good preservation, but closed up again, as it was feared the stability of the chancel arch—the only remaining portion of the original Norman church—would be interfered with.

**NEW CLUB BUILDING, NEWBURGH.**—The Marquis of Salisbury opened, on the 3rd inst., a new club-house at Newburgh, Lancashire. The building is designed in a Late Gothic style of architecture. It has been simply treated, the walls being faced with parapets and having ashlar dressings. The assembly-room provides accommodation for over 400 people, and has a separate entrance for the public from the side street. Retiring rooms, ladies' and gentlemen's, are arranged around the assembly-room. From the entrance hall a staircase leads to the first floor, on which are situated the club-rooms, consisting of two billiard-rooms, reading-room, and rooms for the committee, secretary, and steward, as well as a room for dominoes, chess, &c. The cost of the building is £4,000, the work has been carried out from the designs and under the supervision of the architect, Mr. Percy D. Lodge, of Manchester.

**NEW WESLEYAN CHAPEL AT GOOLE.**—On the 4th inst. a new school-chapel, erected for the Wesleyan Methodist body off Booth Ferry-road, Goole, was opened for public worship. The cost of the building is \$500. Mr. H. B. Thorp, Goole, was the architect.

**A NEW CONVENT AT BAYSWATER.**—A new convent is in course of construction at Bayswater for the order of Notre Dame de Zion; Mr. Arthur Young is the architect. The floors are to be of fireproof construction, and are to be put in by Messrs. Mark Fawcett & Co.

#### SANITARY AND ENGINEERING NEWS.

**THE SANITARY ASSURANCE ASSOCIATION.**—At the meeting of the Council of the Sanitary Assurance Association, held at the offices, 5, Argyle-place, W., on the 8th inst., Sir Joseph Fayrer, K.C.S.I., F.R.S., in the chair, the question of consolidating and amending the Public Health Acts was under consideration, and on the motion of Mr. Mark H. Judge, A.R.I.B.A., seconded by Surgeon-General Cornish, C.I.E., the following resolution was unanimously agreed to:—

"That the Council of the Sanitary Assurance Association learns with satisfaction from the Queen's Speech, that the Government are considering the expediency of consolidating and amending the laws relating to public health, and, therefore, it is hereby resolved to appoint a sub-committee to draw up a memorial to the Government, urging them to incorporate in their Bill the essential features of the Sanitary Registration of Buildings Bill."

On the motion of Mr. H. Rutherford, Barrister-at-Law, seconded by Mr. Andrew Stirling, it was also resolved to send copies of the resolution to the Institutions which took part in the Sanitary Registration Conference of 1887 and 1888; also to Dr. R. Farquharson and the other Members of Parliament who had charge of the Sanitary Registration of Buildings Bill in Parliament.

**NEW ROADWAY BRIDGE OVER THE RIVER CAM AT CAMBRIDGE.**—Owing to the township of Chesterton, which lies immediately opposite to the town of Cambridge on the north side of the river Cam, having considerably increased as a residential place, and to the fact that the College boat-houses being on that side of the river, the boat ferries have proved wholly insufficient for the traffic, besides being very inconvenient and unsafe for children. The town of Cambridge, therefore, joined with the Local Board of Chesterton and obtained Parliamentary powers for constructing a new road across Midsomer Common, just behind Jesus College, and a new bridge across the river. These works are now completed, and were formally opened on Thursday last by the Mayor of Cambridge, jointly with the chairman of the Chesterton Local Board. The new roadway is about half a mile long, and is 40 ft. wide; the bridge is 100 ft. long, and has a span of 40 ft. wide between parapets, and has a clear headway at the centre of 14 ft. 6 in. above the normal water level, a towing-path 12 ft. wide, being formed on the south side. The superstructure consists of six elliptic wrought-iron arches, with braced spandrels, spaced 7 ft. 6 in. centre to centre under the roadway, and 9 ft. 1½ in. to the parapet girders. The outer spandrels are covered with cast-iron ornamental spandrels,

surmounted with cornice, plinth, and parapet, the coats of arms of the Borough, University, County Council, and Local Board being on their respective panels in the centre of the spandrel. The roadway over the bridge is of granite macadam, and the footpaths of granolithic pavement. The abutments are of Portland cement concrete, resting on piled foundations, and faced with Darley Dale stone. The total cost of the work is about £4,000. The engineers for the scheme are Mr. John J. Webster, M. Inst. C.E., of Liverpool and Westminster, and Mr. Frank Waters, of Cambridge; the whole of the work being designed by Mr. Webster, Mr. Waters acting as resident engineer. The sole contractor for the work was Mr. John Mackay, J.P., of Hereford, and he sublet the superstructure to the Butterley Company (Limited).

#### FOREIGN AND COLONIAL.

**NORWAY.**—The committee of architects appointed to consider the designs for a new Historical Museum at Christiania, has received seventeen designs. The first prize of 1,200 kr. has been awarded to Herr Karl August Henriksen, a comparatively unknown architect, whose design has been accepted in its main features. Third prize of 500 kr. has been awarded to Herr S. Lenschow, a leading Norwegian architect. Two new churches of considerable dimensions are being built by the State in Christiania.

**RUSSIA.**—According to news from St. Petersburg the Stadt Theatre at Irkutsk, in Siberia, and the Summer Theatre in Lublin, in Poland, have been burned to the ground, but no lives were lost. The authorities have decided to build immediately new theatres on the sites. In regard to the proposed French Art and Industrial Exhibition in Moscow next year, the German railway authorities have refused to carry the exhibits at reduced rates, so that the promoters will dispatch them by sea via Hull and Royal instead. The famous "Czar's Bell" in Moscow, one of the chief objects of interest in the old Palace of the Kremlin, is to be removed to a chapel built in memory of the saving of the Imperial family in the Borki railway accident. In the chapel tower, which is to be 270 ft. in height, and bell-shaped, the "Czar's bell" will be hung.

**DENMARK.**—The work on the so-called marble cathedral in Copenhagen is progressing. Of late the figures of the Apostles, 14 ft. in height and weighing 1,600 lb. each, and which are to adorn the main entrance, have been placed in position. They are of zinc, and executed by Danish artists. Two new public schools are to be erected in Copenhagen, at a cost of about £20,000. Of late years several interesting frescos have been discovered in old Danish churches, dating from the thirteenth century, and much has been done for their preservation. They all appear to have been executed by foreign artists, probably monks. The subjects are biblical.

**CZECHIA.**—The equestrian statue to Charles II. of Brunswick, which has been a doubtful ornament to the town for some twenty years, is at last going to disappear from view, the pediment alone remaining as a relic. This pediment is, however, to receive some crowning ornament, the design for which is to be obtained by "international" competition, the winning design going as far as to give some very fine prizes, at the same time offering would-be competitors about a month's time for sending in their work.—*Schweizer Bauzeitung.*

**KARLSRUHE.**—A monument to the deceased Emperor William I. is to be erected, and 120,000 marks have, so far, been voted for this purpose. The question is as to the form of the proposed monument has been treated in a way not dissimilar to the "National Monument Question" at Berlin. Whilst public opinion and municipality were in favour of an architectural monument, the Grand Duke of the Duchy of Baden made known in a letter that he wished to see an equestrian statue erected in his capital. The municipality responded in the Grand Duke's wish by opening a competition for designs for a monument in this form, and the assessing jury unanimously recommended a design of Professor Volz's for erection, at the same time giving a second prize to Professor Heer. Professor Volz's design will, however, not be carried out, the Grand Duke having thought fit to recommend the design of the second prizeman to the municipality, who have again taken the wish for law.

**FRANCE.**—The Museum of Rouen has received a gift of a clock in Viedervilles falence which is a very fine specimen of ancient Ceramic work.—M. Paul Maugin has left to the Museum of Douai an important collection of engravings and works of art.—A permanent picture exhibition has been opened in the Galerie Bertrand at Nice.—M. Rouvier, Minister of Finance, has presented to the small town of St. Jean de Villefranche sur Mer a statue "Le Pecheur" by the late Madame Rouvier, well known as a sculptor under the assumed name of Claude Vignon. She was one of the best pupils of Pradier.—The Academie des Beaux Arts has given "A Museum of Sculpture" as the subject of the competition for the Achille Leclerc prize in architecture.—The competition opened for the construction of isolated pavilions for the lunatic asylum at Valdeuse has just been decided. M. Henri Poussin has received the first premium, M. E.

Georges the second.—The jury in the competition for a Lyceum for the town of Epinal has given its award. The first prize of 5,000 fr. has been awarded to MM. Clasquin and Monquet; the second, 3,000 fr., to MM. Coqart and Delaire; the third, 2,000 fr., to M. Jasson; the first honourable mention to MM. Schuler and Berger, the second to M. Jacob. The jury, which has pronounced this to be a remarkably good competition, has decided that the execution should be entrusted to MM. Coqart and Delaire, as the authors of the most practical plan.—The Minister of Public Instruction has reappointed M. Foucart as the new director of the French school at Athens, a position which he has already held, the present appointment expiring with the close of the year. M. Foucart is also charged with an archaeological mission to Egypt.—In getting out the foundations for the College St. Etienne at Châlons-sur-Marne, there have been found in an old wall two sepulchral monuments adorned with sculpture and inscriptions, which appear to be as early as the fourth century. The monuments are rectangular and surmounted by pediments. Above each inscription is carved a figure of a horse and rider.—The Curé of the parish of St. Jacques de Guéret, near Vandame, has discovered in his church two frescos of the twelfth century, interesting both in an artistic and archaeological sense.—The new lunatic asylum for female patients at Bordeaux has just been opened. The architect is M. Valleton, of the Department of the Ministère de l'Intérieur.—A missionary at Tonkin, Père Garçon, has been occupied in constructing there an iron church, of which all the parts have been made in France and transported to the site. It is in the Gothic style, and 55 metres long by 20 wide.—The Société Régionale des Architectes du Nord has addressed to the President of the Republic a petition against the dismissal of Mr. Coqart and St. Jacques, that compensation should be made to him.—The death is announced, at Nouillomont, of M. Achille Flocon, member of the Société Centrale des Architectes, and director of architectural work for the Company of the Chemin-de-fer de l'Est.—We learn also of the death of M. Joseph Burn-Smeaton, wood engraver, born in London, but for a long time past resident in Paris. M. Burn-Smeaton was known by his annual exhibits at the Salon.—The French Fine Art Section of the Moscow Exhibition will include three galleries, of which two will be reserved for works of the highest class. There is also to be a retrospective exhibition of the works of masters of the French School.

#### MISCELLANEOUS.

**PRIZES TO THE ROYAL ACADEMY STUDENTS.**—Sir Frederic Leighton, P.R.A., on Wednesday presented the prizes gained by the students of the Royal Academy. Amongst the prize-winners were the following:—Design for the decoration of a portion of a public building (the "Adoration of the Magi")—Prize (40l.), Alfred Charles Westonsstone. Design in architecture (a country gentleman's house).—Travelling Studentship (60l.), Charles Sidney Spooner. Set of architectural drawings (a portion extending over one bay of the choir, and the screen at their back, in St. Paul's Cathedral).—Silver medal, first class, William Baker; second, not awarded. Set of architectural designs (Upper School).—Prize (25l.), Alexander Mackintosh. Set of drawings of an architectural design (Lower School).—Prize (10l.), James Cromar Watt. Plan of a building (a provincial picture and sculpture gallery). Prize (10l.), Herbert Tooley. Original composition in ornament.—Silver medal, not awarded. Perspective drawing in outline (open to architects only) (the end and three bays of the Hall in Hampton Court Palace).—Silver medal, no competition.

**NORTH SEA-BALTIC CANAL.**—The construction of the large twin-lock on the Baltic end of the canal is now to be taken in hand. These locks, which lie parallel to one another, have a total structural length of 216 meters. The accepted tender is for 3,860,000 marks, or nearly 193,000. These locks, which will have sets of double gates at either end, can either be worked separately or together, according to the requirements. The measurements will permit two German ironclads of the largest type (say *König Wilhelm*, 108 meters stem to stern) to pass through with ease at the same time.

**BERLIN.**—The census held on the 1st inst. shows that Berlin proper has a population of 1,574,485. On the same date in 1885 the inhabitants of the imperial numbered 1,315,287. This shows an increase of 259,198 in five years, or an average of about 52,000 per annum. The above numbers refer to Berlin proper. If the outer suburbs, such as Rixdorf, Schöneberg, &c., be included, the total would be about 1,800,000.

**THE CHIEF INSPECTORSHIP OF CROWN MINES.**—The Western Mail announces that the important offices of Chief Inspector of Crown Mines in Great Britain and Mineral Inspector for his Royal Highness the Prince of Wales for the Duchy of Cornwall, vacant by the decease of Sir Warrington W. Smyth, have been conferred upon Mr. Thomas Forster Brown, C.E., Deputy Gavelier and Crown Receiver for the Forest of Dean.



## COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

## COMPETITION.

Nature of Work.	By whom Advertised.	Premium.	Designs to be delivered.
*Drinking Fountain with Clock, &c. Loughlin.	The Committee .....	£1. 5s. and 2s. ....	Jan. 31

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Shed and Covered Yard over Reservoir at Reigate, Yorks.	.....	W. & J. B. Bailey .....	Dec. 17
Limestone Gravel Metalling (500 tons) Local Board .....	.....	.....	.....
*Purchase and Removal of Old Cottages, Alterations, &c. to Abbey Bridge, Tavlauch	Devon County Council	.....	.....
Re-building portions of Bury Bridge, Walkington .....	.....	.....	.....
Widening Railway Line, M. 1000 ft. .....	Line & Yorks Ry. .....	.....	.....
Enlarging Station, Llandudno .....	J. & N. W. R. .....	.....	.....
Pipe Sower, &c. ....	.....	.....	.....
Work at Grangewood School .....	.....	.....	.....
*Bath Room at Brentford School .....	.....	.....	.....
Supply of Lime and Cement (12 months) Works at Kew, Town, South & Bridge, &c.	.....	.....	.....
Paving Works, Sutton Road .....	.....	.....	.....
Steel Wire Rope, &c. Glasgow .....	.....	.....	.....
Enlargement (4 ft. 6 in. to 6 ft. 6 in.) of Eight Scaffolds, H. 120, Black Side, W. 100, Yorks .....	.....	.....	.....
*Part of Home, &c. Blackheath .....	.....	.....	.....
Shop and Office, Old Market, Halifax .....	.....	.....	.....
*Roadmaking Works .....	.....	.....	.....
Taking-down Old and Erecting a New, Deodar, &c. .....	.....	.....	.....
Travelling Water Tanks .....	.....	.....	.....
Making Promenade, Sewering, &c. Local Board .....	.....	.....	.....
Ornamental Fence and Entrance Gates to Park, Linc. ....	.....	.....	.....
Reservoir (120,000 gallons). Water-wheel, Pump-house, Distribution Pipes, &c. Wingham, Kent .....	.....	.....	.....

Those marked with an Asterisk (\*) are advertised in this Number. Competition, p. iv. Contracts, pp. iv, and vi. Public Appointments, p. xviii.

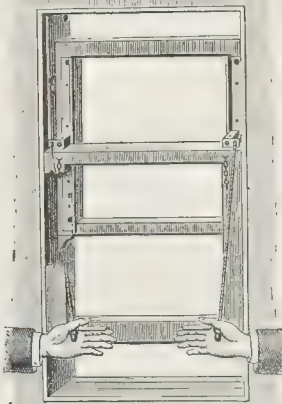
## CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Waterworks .....	Sutton & Ashfield, B. York Corporation .....	G. Hudson .....	Dec. 29
Cutting Track, Pipe Laying, &c. Water .....	.....	.....	.....
Removing an Old and Erecting a New Bridge over the River, near Bury, Essex .....	.....	.....	.....
Completion of Streets and Passages .....	.....	.....	.....
*Iron Doors .....	.....	.....	.....
*External Iron Staircases, &c. at Infirmary .....	.....	.....	.....
Enlargement of Roonale Post Office .....	.....	.....	.....
Additions, &c. to Hospital Buildings .....	.....	.....	.....
Leamington .....	.....	.....	.....
*Roadmaking Works .....	.....	.....	.....
Sewage Works at Hertford Heath .....	.....	.....	.....
Erection of Urinal, Westminster Bridge .....	.....	.....	.....
New Entrance to Tyne Dock .....	.....	.....	.....
Church, Easton, Berwickshire .....	.....	.....	.....
Warehouse, Milner Road Mills, Halifax .....	.....	.....	.....
Improvement to Premises, Guildford .....	.....	.....	.....
New Hall, Leeds .....	.....	.....	.....
Nine Houses and Stabling, Armitage, Leeds .....	.....	.....	.....
Five Houses, near Queenswood, Leeds .....	.....	.....	.....
*Roadmaking Works, Aldershot .....	.....	.....	.....
Construction and Enlargement of School .....	.....	.....	.....
New Hotel, Falmouth .....	.....	.....	.....
Three Cottages, Castle Eden Colliery, &c. ....	.....	.....	.....
Alterations and Additions to Woodland .....	.....	.....	.....
Drain Pipes (1,700 yards), Cramlington .....	.....	.....	.....
Work at Higher Grade School .....	.....	.....	.....

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applicants to be in.
*Teachers .....	.....	100s. and 120s. ..	Dec. 16
*Borough Surveyor .....	.....	250s. ....	Dec. 22

OLROYD'S PATENT SASH-OPENER.—The accompanying cut illustrates the method of bolting or unbolting a window by means of this fastener, which consists of a barrel-bolt in a brass carriage on the lower sash, working into holes in the upper sash, so



Olroyd's Patent Sash Opener and Closer.

as either to keep the window closed or to keep it fixed open at any desired point. The bolts are kept fastened by springs, and pulled out by the cords as indicated. The bolt appears to be a very good, solid, and reliable one which it seems absolutely impossible to reach or meddle with from the outside.

SOCIETY OF ENGINEERS.—The annual dinner of this society was held on Wednesday evening at the Holborn Restaurant, the President, Mr. Henry Adams, occupying the chair. The company, which was numerous, included Sir Benjamin Baker and Sir J. N. Douglass (hon. members); Professor (Unwin, Colonel Banister Fletcher, Mr. A. R. Binnie (Engineer to the London County Council); Mr. J. W. Wilson, jun. (vice-president); Mr. J. E. Ballie, Mr. Jabez Church, Mr. Chas. Gandon, Mr. Perry F. Nurey, Mr. Arthur Rigg, Professor Henry Robinson, and Mr. A. T. Walsley (past presidents); Mr. Alfred Williams (hon. sec. and treasurer), and Mr. G. A. Pryce-Coxson (secretary). After the usual loyal and patriotic toasts, the President proposed for the toast of the evening, "The Society of Engineers." He said during the past year the number of members had increased by 8 per cent., exclusive of honorary members, and the attendance at the meetings had increased by 10 per cent. The

honorary members who had recently been elected were Lord Armstrong, Dr. Anderson (of Woolwich), Sir B. Baker, Lord Brassey, Sir James Douglass, Sir John Fowler, Earl Granville, and Sir William Thomson. The papers which had been read and discussed included various branches of civil and mechanical engineering, and were fully up to the mark of previous sessions. The visits to works in progress and centres of manufacture, one of the privileges of members of the society which was very popular, had this year included the Plants Ironworks, the Royal Arsenal at Woolwich, and the London and North-Western Railway Works at Crewe. In concluding, the chairman said that the progress of the society was largely due to the energy of their founder and treasurer, Mr. Alfred Williams, and their secretary, Mr. Pryce-Coxson.—The toast was acknowledged by Mr. Williams.—The "Health of the President" was proposed by Mr. Walsley and Mr. Adams responded, and gave the health of the president-elect, Mr. W. N. Colm, who was unable to be present. Other toasts followed.

STRIKE AT MESSRS. DOULTON'S LAMBETH POTTERIES.—A strike occurred last week at Messrs. Doulton's Lambeth potteries, the men complaining that the proportion of idle apprentices to journeymen is excessive, to the detriment of the journeymen. Sir Henry Doulton, in a letter to the *Times*, denies that there is any reasonable ground for these assertions. He further says:—

"As to the employment of apprentices generally, I have always strenuously upheld the advantage of apprenticeship, especially in such a handicraft as pottery, which requires considerable manual skill, only to be acquired by long training at an early age.

For many years I endeavored to maintain that system, but, owing to the operation of the Masters and Servants Act and the altered conditions of work, it was a troublesome and unsatisfactory arrangement."

An alternative plan was adopted in all respects equivalent to legal apprenticeship, but substituting a mutual agreement of honorable understanding between the lad and his parents and the firm. By this plan the lad agrees, without any legal compulsion on either side, to work for the firm until he is twenty-one (usually beginning about the age of fifteen), and the firm agrees to employ him regularly as long as he conducts himself with propriety. In consideration of this the firm undertakes to teach the lad his trade without premium, paying him the accepted trade rates hitherto given to apprentices, and adding a yearly good-conduct bonus amounting to £1. in all up to twenty years of age, and an additional bonus of £1. at the close of the last year. They also agree to furnish the lad with a certificate of proficiency at the close of the term in the event of his leaving their employment.

The skilled artisans state that their own employment is endangered by the apprentice system engaged in greater than one to every seven men. In any one establishments, however, this has never occurred. On the contrary, with an increasing number of skilled workmen there has always been an increase of trade."

MACHINERY AT THE SMITHFIELD CLUB SHOW.—In connexion with the Cattle Show at the Agricultural Hall, Islington, held on the first five days of this week, there was a very good show of implements and machinery by several well-known firms as Barrows & Co., Hill & Smith, F. Morton & Co., the St. Pancras Ironwork Co., Clayton & Shuttleworth, Aveling & Porter, Ramsomes, Sims & Jeffries, E. S. Hindley, Aveling & Porter, E. R.

and F. Turner, Waller & Stevens, R. Hornsby & Sons, Robey & Co., John Fowler & Co., and Marshall Sons & Co. Among the exhibits of the last-named firm must be mentioned an independent vertical engine cylinder, 6 ft. in. by 10 in., fitted with Moore's patent crank-shaft governor and automatic cut-off balanced slide-valve, and a patent automatic sight-feed lubricator, &c. The engine is especially designed for use with electric-lighting plant. There is good provision for lubrication, and the governor, it is claimed, controls the engine to such a nicety that there is practically no variation in the speed, however much the load may change. Another exhibit worth special note is Priestman's oil-engine, which is shown in two sizes by Messrs. Priestman Bros., Limited, of Hull and London. An 11-h.p. Priestman's patent portable oil-engine is mounted on wheels with shafts, &c., and complete. The special feature of this exhibit is the application of this motive power in a portable form. The makers claim it to be the first introduction as such. In this form it is useful for many purposes, especially for country districts where there is no gas, or where gas is dear and it is not convenient to use steam. The cost of the oil-fuel, we are told, is about equal to the cost of working a gas-engine with gas at 6s. per thousand.

## LEGAL.

## INSANITARY HOUSES IN BETHNAL-GREEN.

At the Worship-street Police Court, on Wednesday, the magistrate, Mr. Montagu Williams, gave judgment in the matter of the 42 houses, the owners of which were proceeded against by the sanitary authority of the parish of St. Matthew, Bethnal-green, under the Housing of the Working Classes Act, to show cause why the said houses should not be closed. Proof of the insanitary condition of the houses was given last week by the officers—Messrs. Lapworth, Foot, and Weston—Mr. G. P. Bate, Medical Officer of the parish, certifying that they were unfit for human habitation. The magistrate had adjourned the matter in order that he might inspect the premises complained of and so form an opinion as to what length of time should be allowed the tenants for removing. According to the *Times* reporter, he now said that, having spent several hours in going in and about the houses complained of, he was convinced that, with regard to all but one, he ought to make the orders asked for. A house belonging to a Mr. Scott was so far advanced in satisfactory repair that there was no reason for making an order. With regard to the others, he could not see how they could be put into habitable state by any amount of repair. That, however, was a matter for the owners. How the people had lived in them he could not say. With respect to some houses in Cheshire-street, the people kept small shops, and he suggested that, as the businesses would be destroyed if the people were turned out at once, they should be allowed as long as possible, —two months,—to find other places, and, failing that, that they should be moved from house to



house,—that was to say, when one house was ready the occupants of the next to be repaired should be allowed to occupy it.

Dr. Date said every attention should be given to that point.

Mr. Montagu Williams asked what had become of the County Council scheme with respect to clearing other sites in Bethnal-green, and providing houses for the people displaced?

Dr. Date said that it was in abeyance.

Mr. Muskett Yetts, solicitor, on behalf of an owner named Dixon, raised objections to an order to close.

The magistrate said the houses could be reopened as soon as the Medical Officer was satisfied with their condition. The Act gave magistrates power to order the landlord to pay compensation for displacement to the tenants as a penalty for letting the houses get into such a condition. He had not put that power in force, and he thought the owners in these matters had been leniently dealt with.

Having seen the houses, he was satisfied of their condition, and though he had been catatrophed as to why he decided to do so, he could not see how one could know the condition of the places and the needs of the tenants unless personal inspection was made.

## MEETINGS.

### MONDAY, DECEMBER 15.

Royal Institute of British Architects.—8 p.m.  
*Speech of Arts (Gandor Lecture).—Professor Vivian B. Lewes on "Gaseous Illuminants." IV. 8 p.m.*

### TUESDAY, DECEMBER 16.

Institution of Civil Engineers.—Further discussion on (1) Mr. F. E. Robertson's paper on "The Lansdowne Bridge over the Indus at Sukkur"; (2) Mr. E. W. Stoney's paper on "The new Chittivair Bridge, Madras Railway." 8 p.m.  
 Statistical Society.—7.45 p.m.  
 Manchester Architectural Association.—7.30 p.m.  
 Glasgow Architectural Association.—Mr. Francis H. Newberry on "Impressionism in Architecture." 8 p.m.

### WEDNESDAY, DECEMBER 17.

Royal Meteorological Society.—Five papers to be read 7 p.m.  
 Society of Arts.—8 p.m.

### THURSDAY, DECEMBER 18.

Society of Antiquaries.—8.30 p.m.  
 Leeds and Yorkshire Architectural Society.—"At the Cathedral Door," by Mr. Wyke Baylis. 7.30 p.m.  
 York Architectural Association.—Mr. B. Priestley Shires on "The Domestic Life of the Middle Ages, as shown by its Architecture."

## RECENT PATENTS:

### ABSTRACTS OF SPECIFICATIONS.

19,814.—SLOW-COMBUSTION GRATE: G. T. Plunkett.—The grate, which is made of cast-iron, has a specially-formed coving or hood, in order to assist the draught. A chamber is made at the back of the fire-place, and this and the coving is made in one piece to suit the current of air being generated and circulated in the apartment.

20,541.—FIRE-PLACES: W. Russell and Others.—The improvement, which is the subject of this patent, is in the smoke exit and draught-regulator in "Wilmington" and such like grates, and consists in a sliding-box over the roof of the fire through which the products of combustion pass, and the chimney, and from thence they may be readily removed. The front or canopy is hinged and in the interior of the box a sliding-plate is fitted in such a position that when it is thrown back the passage to the chimney is open, and the flap acts as a check to blow down or back draught of smoke, &c. into the room. When the flap is drawn forward it falls against the front plate or canopy and closes the passage to the chimney when the grate is out of use.

11,978.—GLAZING: H. Hilton.—The glass rests on a cushion of lead or metal, and has a dust and water protector, and a covering cap fitted. The glazing-bar is of peculiar shape, and is channelled to carry away condensation.

12,167.—ORNAMENTAL MOULDINGS: O. Graetzer.—Shaped or plates of end wood are made in a peculiar manner, and are strengthened so that they cannot spread under pressure. Trunks of trees are cut longitudinally, and planed at the sides with a serrated plan, which forms grooves. The sides are then painted with a thin layer of glue, put together, and exposed to hydraulic pressure, so that the beams adhere firmly together at every point. They are then cut across their longitudinal axis into end wood, then moulded by rollers under great pressure.

12,215.—PRESERVING PAINT BRUSHES: H. Davis.—This invention refers to a portable metal made of non-corrosive metal, with a contrivance for suspending the brushes clear from the bottom. A metal tube is inserted, and the handles of the brushes, which are suspended by pins passing through the tube.

15,523.—PORTABLE HOUSES: F. Wheeler.—The pieces composing the house, shed, kennel, or similar structure are shaped and numbered in such a manner that they may be promptly and easily taken to pieces, or erected for cleaning or transport.

15,541.—FIREPROOF DOORS, &c.: R. Hallenstein.—Doors are fitted to close, and are automatically closed by the action of the lift, or worked by hand-power. Suitable mechanism for this purpose is described.

## NEW APPLICATIONS FOR LETTERS PATENT.

November 24.—19,013, D. GUN Water-closet Apparatus.—19,056, G. Klueber and H. Geyon, Lining Brush Attachment.—19,063, T. Racknell, Ceilings.

November 25.—19,075, W. Day, Chimney-cowl.—19,139, W. F. Atter, Cowl and cap for chimneys, &c.—19,141, W. Thompson, Door-hinges.—19,144, G. W. Williams and A. Culpin, Metallic-hinges for doors, &c.—19,154, J. Bard-

sley, Door-spring and Check.—19,159, C. Keith, Grates.—19,192, G. Spring, Sash-holders.

November 26.—19,222, R. Bay, Norfolk and Suffolk Latches.—19,249, J. Winterwood, Ventilating Geyers.—19,260, C. & J. Smith, Wood-working Machines.

November 27.—19,292, H. Hardy, Connecting Lead-pipe to Earthenware, &c.—19,302, J. Brookfield and J. Whitehead, Cramp for Picture-frames, &c.—19,306, T. Switzer, Mirrored Mouldings, &c.—19,320, R. Henderson, &c.—19,325, E. Edwards, Imitation Walnut-wood.—19,348, A. Whitehead and J. Brookfield, Window-sash Fasteners.

November 28.—19,415, J. Spear, Ornamentation of Wood.

November 29.—19,440, H. Dwight and others, Hanging of Doors.—19,464, H. Chaplin, Draught, Dust, or Water Excluder for Doors, Windows, &c.—19,476, J. Bayly, Rock Drill.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

15,320, J. Smeaton, Ventilation and Flushing of Drains, Sewers, Soil-pipes, &c.—16,789, R. Stone, Fire-proof Plastic Material for Cement, &c.—17,305, T. Fleming, Flushing Apparatus.—17,367, R. Edwards, Strips for Doors and Casement Windows.—17,417, G. Lewin, Door Handles, &c.—17,581, T. Twyford, Sinks.—17,595, J. Dixon, Securing Windows, &c.—17,684, W. Bell and others, Self-locking Casement Stay.—17,698, E. Cusack, Automatic Self Bolt.—17,745, J. & A. Duckett and L. Stanworth, Flushing Tanks and Water-closets.—17,805, J. Bell, Door Latches.—17,840, C. Pearson, Flushing Apparatus.—17,867, R. Edwards, Sawing Machinery.—17,971, E. George, Combination Wood-working Machines, for Planing, Moulding, Tenoning, &c.—17,983, A. Whowell & F. Chadwick, Water-closets.—18,009, J. Bayly, Bench Planes.—18,093, J. Le Mesurier, Window Patenting, &c.—18,131, L. Hutton, Ventilating Valves and Wall Ventilators.—18,332, J. Woodward, Varying Surfaces of Stair-treads, &c.—18,337, R. Howland, Fastener for Doors or Windows.—18,468, F. Jurschka and R. Von Gensche, Artificial Stone, or Composition and Building Blocks.—18,474, W. Chapman, Window Fastening.—18,520, A. Cromer, Doors or Windows.—18,569, T. Arnold, Manufacture of Cement.

## COMPLETE SPECIFICATIONS ACCEPTED.

### Open to Opposition for Two Months.

1,139, G. Hurdle, Self-lubricating Pulleys for Window Sashes, &c.—1,346, W. Sugg, Ventilating Apparatus.—1,527, T. P. & J. H. B. Blow-pipes.—15,591, J. Ricketts and T. Lorraine, Complings for Water-closets for Drains, &c.—16,067, F. Synde, Gully Water-closet and other Traps.—16,906, D. Gardner, Joining Pipes or Tubes.—17,047, J. Barclay, Water-closet Basin.—17,135, J. Flouich, Screw Nails, &c.

## SOME RECENT SALES OF PROPERTY:

### ESTATE EXCHANGE REPORT.

DECEMBER 2.—By Weston & Son: 1. Geneva-rd., Brixton, u.t. 76 yrs. g.r. 81, r. 301, 3001; 50 to 62 (even). Lansdowne-rd., Clapham-rd., u.t. 69 yrs., g.r. 421, r. 301, 2,240.—By Sherrin & Coleman: 1. g.r. of 100, u.t. 54 yrs., at a peppercorn, Hampstead, 1,500; 64, 84, John's-rd., Holloway, f. r. 601 p.a., 7761.—By Cherterton & Sons: 35 and 37, Warwick-gardens, Kensington, u.t. 58 yrs., g.r. 54, 2,500; 39, Warwick-gardens, u.t. 58 yrs., g.r. 54, r. 1001.—By Bond, Bond, & Bond: 5, Lambourne-rd., Clapham, u.t. 54 yrs., g.r. 51, p. 314, 8407, 58, Manor-rd., u.t. 17 yrs., g.r. 51, p. 301, 1697.—By Debenham & Co: 24, Brondesbury-villas, Kilburn, u.t. 67 yrs., g.r. 101, r. 601, 5604; 24, Brondesbury-villas, u.t. 67 yrs., g.r. 101, r. 601, 6204; 30 and 32, Brondesbury-villas, u.t. 67 yrs., g.r. 241, r. 1401, 1,280; 73 and 80, Denmark-rd., u.t. 62 yrs., g.r. 121, r. 954, 5552, 2, 3, and 4, Rupert-rd., u.t. 69 yrs., g.r. 171, 108, r. 1204, 124, 6054; 37, Cambridge-rd., Lee, u.t. 74 yrs., g.r. 101, 3001; 164, Southgate-rd., Kingland, u.t. 33 yrs., no g.r., 300.

DECEMBER 3.—By W. Coppin: 110, Chetwynd-rd., Dartmouth Pk., f. r. 601, 6001; 108, 116, and 118, Chetwynd-rd., f. r. 1354, 1,700.—By W. Coppin: 1, r. 301, 3701, f. r. 601, 6001, adjoining, r. 301, 3701.—By Rogers, Chapman, & Thomas: 36, Denbigh-pl., Pimlico, u.t. 40 yrs., g.r. 81, r. 601, 6284.—By E. Evans: 162, 164, and 158, Leathwaite-rd., Chiswick, u.t. 94 yrs., g.r. 191, 108, r. 601, 7401; f. g.r. of 51, with reversion in 74 yrs., 1101.

DECEMBER 4.—By A. Watson: 100, 102, and 104, Gayford-rd., Shepherd's-bush, u.t. 91 yrs., g.r. 191, 108, r. 371, 44, 3201.—By Bond & Son: A f. plot of land, Eastcote-st., Stockwell, 1,7201; No. 134, Camberwell New-rd., u.t. 11 yrs., no g.r., r. 401, 1601.—By A. G. Thomson: Co. 29 & 31, Truak-st., Battersea, u.t. 87 yrs., g.r. 121, r. 581, 1284, 4701.—By H. Hunter: 73, Horsey-rd., Holloway, u.t. 52 yrs., g.r. 61, p. 554, p.a. 4101; 59, Windsor-rd., u.t. 62 yrs., g.r. 51, p. 58, r. 3201.—By Newson & Harding: 2, Amber-pk., Highbury, u.t. 91 yrs., g.r. 81, r. 381, 3454; 133, Copenhagen-st., Barboursby, u.t. 53 yrs., g.r. 61, 4001; 2, Barboursby-rd., u.t. 57 yrs., g.r. 101, 3501; 14, Healey-st., Kenilworth-rd., u.t. 66 yrs., g.r. 71, r. 371, 3501; 41, Gifford-st., Calcutt-rd., u.t. 64 yrs., g.r. 61, r. 391, 3201; 5 and 6, Highfield-rd., Wood Green, u.t. 91 yrs., g.r. 51, 1001.—By Bond & Son: 4 and 6, Haverstock-rd., City-rd., u.t. 34 yrs., g.r. 121, r. 641, 4551; 10, Jack-st., City-rd., u.t. 72 yrs., g.r. 61, p. 68, r. 381, 3501; f. g.r. of 211, with reversion in 77 yrs., East Dulwich, u.t. 61, f. g.r. of 271, with reversion in 96 yrs., Waltham-stone, 5401.

DECEMBER 5.—By Rushcroft & Stevens: No. 27, New Bond-st., City-leashold, g.r. 61, r. 4101, 9,7201.—By Bennett & Goodwin: 67, Tully-rd., Holloway, u.t. 74 yrs., g.r. 91, 4051; 4, 6, and 8, Upper Winchester-rd., Oxford, u.t. 75 yrs., g.r. 121, r. 621, 4001; f. g.r. of 61, with reversion in 74 yrs., u.t. 11 yrs., at a g.r. of 14, King's Cross, 4001; 106 to 114 (even), High-st., Bromley-by-Bow, u.t. 92 yrs., g.r. 301, 7001; 5, Leyton-villas, Leyton, u.t. 73 yrs., g.r. 51, r. 31, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 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[Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; l. for leasehold; u.t. for unexpired term; p. for per annum; yrs. for years; at for street; rd. for road; for street; p. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

## PRICES CURRENT OF MATERIALS.

### TIMBER.

	4 s. d.	4 s. d.	4 s. d.
Greenheart, B.G. ....	ton	6 15 0	7 5 0
Teak, E.I. ....	load	10 0 0	12 0 0
Sequoia, U.S. ....	foot cube	0 2 0	0 3 0
Ash, Canada, ....	load	2 10 0	4 5 0
Birch " ....	2 5 0	4 5 0	
Elm " ....	3 10 0	4 15 0	
Fir, Danish, &c. ....	2 0 0	3 15 0	
Oak " ....	2 10 0	4 10 0	
Canada " ....	4 17 6	6 10 0	
Pine, Canada red " ....	2 10 0	3 10 0	
" 2nd " ....	0 0 0	8 10 0	
Lath, Danish, ....	fathom	5 0 0	5 10 0
St. Petersburg " ....	5 0 0	7 0 0	
Deals, Finland, 2nd & lat. std. 100	7 10 0	10 0 0	
" 4th and 3rd " ....	7 0 0	7 5 0	
Riga " ....	6 0 0	8 0 0	
St. Petersburg, lat yellow " ....	9 10 0	14 10 0	
" white " ....	7 10 0	9 0 0	
Sweden " ....	7 0 0	15 10 0	
White Sea " ....	8 0 0	17 0 0	
Canada, Pine, 1st " ....	13 0 0	0 0 0	
" 2nd " ....	9 0 0	26 0 0	
" 3rd, &c. ....	7 0 0	10 0 0	
" Spruce, lat " ....	8 10 0	10 10 0	
" 2nd " ....	6 10 0	8 0 0	
New Brunswick, &c. ....	6 10 0	7 10 0	
Battens, all kinds " ....	10 0 0	15 10 0	
Flooring Boards, sq. ft. 1 in. pre-			
pared, First " ....	0 10 0	0 14 0	
Second " ....	0 0 0	0 10 0	
Cedar, Cuba, ....	0 0 0	0 7 0	
Honduras, &c. ....	0 0 0	0 10 0	
Mahogany, Cuba, ....	0 0 0	0 0 0	
" Domingo, cargo average " ....	0 0 0	0 0 0	
Mediana " ....	0 0 0	0 0 0	
Tobacco " ....	0 0 0	0 0 0	
Honduras " ....	0 0 0	0 0 0	
Rox, Turkey " ....	ton	4 0 0	18 0 0
Bahia " ....	12 0 0	18 0 0	
Bahia " ....	10 0 0	18 0 0	
Batin, St. Domingo, ....	foot	0 0 0	1 8 0
Walnut, Bahia " ....	0 0 10 0	0 1 0	

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# The Builder.

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SATURDAY, DEC. 30, 1890.

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Tomb of Juba II.: Existing Remains.—Drawn by Mr. Alexander Graham, F.S.A. ....	Single-Page Ink-Photo.
Entrance to the Chapel, Bargello, Florence.—Drawn by Mr. H. W. Lonsdale .....	Single-Page Ink-Photo.
Tombs of Numidian Kings.—Drawn by Mr. Alexander Graham, F.S.A. ....	Double-Page Photo-Litho.
Paneling, Church of St. Vincent, Rouen.—Drawn by Mr. Arthur A. Hind .....	Single-Page Photo-Litho.
Old Well-heads, Padua and Venice.—Drawn by Mr. Richard Glazier .....	Single-Page Photo-Litho.

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### The Profession and the Building Trades in Australia.



HERE are about 120 architects enumerated in Sand's Sydney Directory for 1890, and the population of the city is about 400,000, so that it will at once be seen the proportion of men in practice is unusually high. Amongst the number may be found many who have been properly trained to their work, either there or here, and whose artistic efforts would be appreciated in any city of the civilised world. Of course there is no one whose work is equal to that of the leaders of the profession in England; and in such a comparatively small community, this result could not be expected. On the other hand, there are a very large number of so-called architects, who have had no professional training whatever, except such as may be obtained from performing the duties of clerk of works, builder, foreman, or superior workman. The younger men who are coming on are, however, obtaining a much better training, and the class above referred to will gradually die out. The same general description will also apply to Melbourne and the other capital cities, except that on the whole there appears to be generally more building work in progress in Melbourne than in Sydney. With regard to the results in quality, both of design and execution, there is a considerable amount of emulation between the two chief cities, but it would be hard to say which can claim the first place. In Melbourne many of the leading architects are associated together as members of the Royal Victorian Institute of Architects, which at the present time has a muster-roll of 150. The present president is Mr. G. C. Inskip, F.R.I.B.A., and the retiring president, Mr. Lloyd Tayler, F.R.I.B.A., who also represents the R.I.B.A. as hon. sec. for the colony. In New South Wales a local Institute was formed about eighteen years ago, and has had a chequered existence, and owing to dissensions many of the best men in Sydney feel unable to join it. There are, however, no less than

sixteen Fellows and Associates of the Royal Institute of British Architects resident in the city, and these have just determined to meet monthly for the purpose of friendly intercourse and conference on architectural subjects. The professional education of the younger members is much in the same state as it was in England thirty or forty years ago, before the Architectural Association became a power,—that is to say, a youngster is turned loose into an office, and has to pick up his training in the best way he can. The only aids at present available are a course of lectures at the University of Sydney on the History of Architecture and Building Construction, and the Association of Architects' and Engineers' Assistants at Melbourne, which is following on the lines of the Association at home.

In Brisbane and in Adelaide Institutes were formed about a year or so since, and one or two papers have been read. The question of registration of architects was also first mooted in the latter city by a Bill being introduced in the South Australian Parliament, but nothing, so far, has come of it. In Brisbane the Institute took up the question between builders and architects with reference to a Lien Bill, and also as to conditions of contract.

In all the Colonies it is as yet a day of small things in the matter of professional societies, conflicting personal interests being, unfortunately, too strong, and the community too small to render any united action possible. This will, however, be remedied as population increases, and the level of professional education is raised.

Among the factors that seriously affect architectural expression materials hold a very important place. For instance, in Sydney and the district around, sandstone is found cropping out almost everywhere at the edges of creeks and rivers; and in one particular spot—viz., at Pyrmont, close to the heart of the city, is a quarry of fine-grained sandstone of a beautiful golden-brown colour. This has been used in many of the public buildings, and its effect is superb; but its durability, alas, is by no means assured. In Melbourne, on the other hand, a very dark, bluish-grey stone is the local material, and its effect in mass is just as depressing as that of the Sydney stone is cheerful. Its durability is,

however, unquestioned. The defect in colour has led to the use of a soft imported white stone from New Zealand, and more recently to the introduction of a white, hard, and apparently durable stone from Stawell, in Victoria. But the prevalent building material in either city is not stone, but brick—in Sydney usually coated with cement, but in Melbourne not infrequently pointed and exposed. Variation in quality and climate is the reason. Bricks coated with cement may, however, be considered the normal type of building throughout Australia, as it is the cheapest and simplest mode of forming a weather-proof dwelling. Hollow walls are now being introduced, and, with improved qualities of facing-bricks, will in time effect a wholesome change. For roofing, imported Welsh or American slates are largely used in the towns, but for cheap buildings, and almost universally in the country districts, to which carriage is expensive, galvanised corrugated iron is the only covering. To English eyes this at first has a very temporary look, but in the dry climate of Australia its life under favourable conditions may be put at forty or fifty years; and as a water-collecting surface,—a most important qualification where rain is the only supply,—it is unsurpassed. Moreover, slates do not stand sudden variations of temperature, and in Queensland especially their use is very limited. Tiles were until lately unknown, but importations are now being made from the South of France, of an interlocking variety, which is meeting with some favour, and in a few cases plain tiles, imported or of local manufacture, have been adopted. They have many practical defects, but the question of roofing is too important to be entered on at this stage. For carcase timber the native hardwoods are largely used, but, owing to the reckless mode of felling at all seasons of the year, the impossibility of obtaining seasoned stuff, and the consequent shrinkage and twisting, it is falling into disuse, and imported American pine, known as Oregon, is taking its place. The cost of handling and working Oregon is also less than that of the heavy native timbers. For finishings, native cedar, a wood something like Honduras mahogany, but lighter in weight and coarser in grain, used to be the universal material in New South Wales, but both there



and in Victoria imported American pine and Baltic deal are now very largely used. In New Zealand Kauri pine is the staple, and large quantities of flooring and linings are shipped to the other colonies. It makes a floor which is hard to beat. As regards such items as mantelpieces and grates, gasfittings and ironmongery, tiles, and other manufactured articles, the bulk are imported, and will be so, notwithstanding protective duties, until the population has largely increased. There are many firms doing good work in a comparatively small way, but they cannot as yet compete in quality or price with the great establishments of England and the Continent. The reason is not far to seek. Labour is approximately 30 to 50 per cent. dearer than at home, and the working day is eight hours.

This brings us to a very important subject. The complete organisation of labour in Australia is an accomplished fact,—at any rate, in the trades connected with building. Every trade has its union, and these unions are federated and combined, the representatives forming what is known as the Trades Hall Council. For some time past, owing to the slackness of trade, there have been but few labour disputes; but when business revives the power of the workman is at once felt. The general prosperity is, however, so great that all travellers are agreed in describing Australia as "the Paradise of the working man," and it is undoubtedly true that hand-workers receive better pay and possess more advantages in Australia than in any other portion of the globe. The old cry of "eight hours' work, eight hours' play, eight hours' sleep, and eight shillings a day," is realised in that happy land, even by unskilled workmen: while skilled tradesmen, such as masons, bricklayers, and lead-workers receive 11s. per day, and plasterers, gasfitters, carpenters, and joiners receive 10s. per day. Of course, the advance on English wages is not absolute, as the purchasing power of money is rather less than in England. This is especially the case with house-rent, and to a less extent in clothing; but food is, on the whole, quite as cheap; while education is in some colonies free, and in others the fees are very low, but in all cases the training is excellent. A prudent workman can, however, now provide himself with a house of his own on easy terms, and thus his chief outlay is minimised. There is, however, a shady side to the picture in the somewhat severe fluctuations of trade, causing occasional want of employment even for good workmen, but these times of depression only tend to throw the general state of prosperity into higher relief. As before stated, the working day is one of eight hours, and this limitation of the hours of labour has been in force for many years. It has become such an institution that the great festival of the workmen is the anniversary of the establishment of the eight hours system, on which day all labour is suspended, and the various trades indulge in a monster procession through the streets, with cars and groups, emblematical of the different trades, and banners and scarves *ad libitum*. It is a veritable festival of labour, such as cannot be witnessed in any other country in the world.

Just at the present time a determined attempt is being made to compel all employers to adopt only Union labour, and the great strike the Colonies are now suffering from will determine whether freedom of contract is or is not to be a thing of the past. To the general public this appears to be an abuse of the Trades Union system, and the present indications are that the men will not succeed. Politically, the workmen have great power, and know how to use it. Hitherto it has been judiciously employed, but there is an indication that labour may become a tyranny as great in its way as that of capital. These indications are becoming so patent that the employers are taking a leaf out of the workmen's book and forming themselves into a federated Employers' Union. This means that the next fight, whenever it comes, will be still more severe, for when banded labour has to meet banded capital, then will come

the tug of war, the issue of which no man can foretell.

The quality of work turned out appears to be equal to the average of that produced in England. This is especially the case in masonry. In brickwork the men have as yet had little opportunity for showing what they can do in "face-work," owing to the almost universal use of cement as a caving. Plasterers turn out very creditable plain and moulded work, but modelled decorations leave something to be desired. Some of the carpentry and joinery is not to be excelled in any part of the world, but, on the other hand, there is a good deal of very low-grade work produced. This is owing to the demand for rough carpentry up country producing a race of "bush" carpenters, who gradually work their way into the trade, and so lower its standard. Founders and smiths are perhaps the least satisfactory of any, and a firm doing first-rate work in these branches of the building trades at fair prices would meet with plenty of encouragement,—at any rate in Sydney, and we believe also in Melbourne. The best castings, a little time since, were made in Adelaide, and very creditable work has been turned out in Brisbane. Those special or accessory branches of the building trades in which artistic knowledge is essential, as may be anticipated, the least developed; but public taste is rapidly improving, and the demand for this class of work will quickly increase. Any one starting now would, therefore, have a good prospect of success. But let us give a word of warning in case these lines should be read by any who are thinking of transferring themselves and their belongings to the southern hemisphere. Second-rate men are not wanted,—they are there already. First-rate men of any standing are, of course, fully employed in England, hence it is the first-rate man who has his way yet to make, who would find the change profitable. In this connexion we would add that in Melbourne as good stained glass is being produced as in the best ateliers of London, and in Sydney, as good bronze and brass work as can be desired.

The practical management of building operations is largely in the hands of builders and contractors, who take lump contracts for the whole of the operations; but the practice of sub-letting is almost universal, very few firms carrying the work through with their own men. Often two firms will combine to tender for an important work, dividing the trades between them. One may carry out the carpentry and joinery and the other the masonry or brickwork, by day labour, sub-letting the rest. This mode has its advantages and disadvantages. The chief trades in such a case are well carried out, but considerable care has to be exercised in the approval of sub-contractors. Of course, all conditions of contract contain the usual clause that no sub-letting will be allowed without the written consent of the architect or engineer as the case may be; but this limitation is rarely enforced. On the whole the result is fairly satisfactory, and in some cases where the principal contractor is a man of high standing, and selects sub-contractors of equal repute, better work is produced than by day work under foremen in each trade. This is due to the greater skill and higher standing of the sub-contractors. Of course, in the small communities of Australia there is not the same scope for large firms like those of London, but the best men would by no means take a back seat amongst their English confrères. Owing to the less extensive character of their business they have not yet lost a practical knowledge of the trades and become simply acute financiers and capable administrators, and this is by no means a small advantage. In order to protect their interests the builders of Sydney have formed a Builders' and Contractors' Association, which numbers 850 members. About 200 of these are chief contractors, the remainder being made up of sub-contractors and representatives of firms dealing in building materials. They also possess an Exchange, where a large amount of busi-

ness is transacted, effecting a great saving of time and expense, especially in the arrangement of contracts for materials, and the supply of goods. The Association also holds regular meetings at which matters affecting the interests of the trade are discussed, one important item at the present time being the conditions of contract which they wish to see adopted in all building works. In labour disputes the Association is also to the front, and by meeting the members of the Trades Hall Council, representing the men, difficulties, which otherwise would lead to friction, are frequently amicably settled. In legislation the Association is also able to make its voice heard and influence felt. One special Bill in which they are much interested at the present time, is a "lien" law, giving contractors and workmen a first claim on all work which the employer is unable to continue. In Melbourne, until quite recently, there were two Builders' Associations, but these have happily become amalgamated, and now form one powerful Society. It is run on the same lines as that at Sydney, but the members do not yet possess an Exchange, although negotiations are in progress for its institution.

## THE TOMBS OF NUMIDIAN KINGS.

BY ALEXANDER GRAHAM, F.S.A.

**T**HE historic importance of sepulchral monuments has not always been fully recognised. Indeed, it was not till the close of the last century, when a taste for antiquarian pursuits was encouraged, that any attempt was made to illustrate this branch of archaeology, or to classify different structures as appertaining to different periods or different races. The enthusiasm aroused in these islands by the discovery of a simple tumulus, with its buried relics of flint or stone, bronze or vitrified earth, testifies to the value we now attach to any form of sepulchral monument. And if this be the case in a country comparatively modern in the world's history, how much more should our interest be awakened in those monuments that are frequently the sole visible remains of a people long passed away, and whose nationality is now almost forgotten. The progress of tomb-construction must have been the same in all countries. The upturned earth, the heap of stones, the rude masonry, were the earliest stages of a class of structures that developed at last into the gigantic Pyramids of the Pharaohs, the gorgeous domes of the Mogul Empire, the sepulchre of Mausolus, and such remarkable edifices as those which form the subject of this paper, and which may, not inaptly, be termed, "The Tombs of Numidian Kings."

The records of that part of North Africa called Numidia by the Romans, but known as Libya by the Egyptians, are necessarily very scanty. It is not to be expected that a nation composed of a number of tribes, for the most part living in tents and having no fixed habitation, should have had any literature of its own. Contemporary history touches lightly on the subject, and consequently we know but little of a people who were regarded by Egyptian, and Greek, and Roman as a mere horde of barbarians, and whose alliance was only to be courted in time of war. The earlier of the two monuments under consideration dates from the close of the second Punic War, B.C. 201. At that period the intellect of Alexandria, the greatest of Greek colonies, was in its infancy, and the learning of the Egyptians, that had influenced other countries far more remote, had not spread westward of Carthage. It should also be borne in mind that the entire dependence of the tribes of North Africa upon Carthage, still the mistress of the Mediterranean, and the constant predatory warfare between the two divisions of the country, called by the Romans Eastern and Western Numidia, checked any great advance in the arts of civilisation. It was this division of the kingdom that proved so disastrous in its consequences, contributing



so largely to the rout of Hannibal's army on the fatal plain of Zama, and paving the way for the gradual extinction of a once-powerful race. The throne of Eastern Numidia was then occupied by Massinissa, while Syphax ruled over the Western division. In Massinissa were combined the fearlessness of his race and the foresight of a statesman. Intimate acquaintance with the more skilled warfare of the Romans prompted him, at the earliest opportunity, to throw off the yoke of his Carthaginian masters and to cast in his lot with the invading army. Syphax, on the contrary, more through hatred of his rival than from any affection for his country, held with the ill-fated Carthaginians, and paid the penalty of his faithfulness by the loss of his kingdom, which was afterwards transferred to Massinissa as the reward of his services. The story of these two kings, their restless struggle for supremacy, their rivalry in love as well as in war, and their shifting alliance with the Roman invader, is full of dramatic interest, and has a more important bearing on this eventful period than many historians are willing to recognise. The remarkable career of Massinissa, the inglorious fate of Syphax, and the tragic end of the woman whose charms exercised so fatal an influence over both, are matters appertaining to history rather than to archaeology. It is not too much to assert that, had these warriors preserved their allegiance to their natural allies, the Carthaginians, the Roman occupation of North Africa might have been stayed for many a long year, and the sad tale of the third Punic War have never been written.

The earlier of the two monuments, of which illustrations are here given (see lithograph), is situated about fifty-two miles south of Constantine, and is known by the Arabs as the Medrasen, probably after a tribe called the Madres, who occupied a neighbouring territory on the northern slopes of the Aures mountains. By some it has been thought to be the sepulchre of Syphax, and there is a tradition that it was erected by the Emperor Probus in honour of the African chief Aradion, who fell bravely in battle with the soldiers of the Empire. We may pass by these conjectures, for it is tolerably certain this edifice was either erected by Massinissa towards the close of a remarkable life of ninety-seven years, as a sepulchre for himself and his descendants; or by his son and successor, Micipsa. Its situation in the centre of his kingdom, and at a convenient distance from his new capital Cirta, the modern Constantine, favours this opinion. There is no sufficient ground for supposing it to have been built by Syphax, for it must be remembered that Western Numidia, over which he ruled, corresponded nearly with the modern provinces of Algiers and Oran, and that his capital, till the last years of his reign, was at Siga, on the western frontier of his dominions. Moreover, Syphax was led captive to Rome and died in prison.

The form of the tomb is a cylinder, surmounted by a truncated cone formed of a series of stone steps, each step being 21 in. high. The cylinder, having a diameter of about 190 ft., is ornamented by sixty engaged columns, with a frieze and cornice, and stands on three steps which form a base to the entire monument. The material of the facework is a fine sandstone, but the mass of the structure is formed of thin slabs of inferior stone in regular courses, having at a distance the appearance of bricks. The interest of the structure lies in the peculiarity of the architecture. The columns and cornices are Egyptian in character. The capitals are Greek. The general form is that of ancient monuments of other countries, of Hindoostan and even of America. It is, in fact, one of the few existing buildings that marks the transition in Africa between Egyptian and Greek art, and was, probably, the work of an architect from the neighbouring colony of Alexandria. The entrance to the sepulchral chamber, which is nearly in the centre of the monument, is above the cornice on the west side, and is approached by a series of steps and a narrow,

straight gallery. The tomb has been ransacked from time to time in search of treasure, and, from the charred appearance of some of the stonework, attempts must have been made to set it on fire. It was not till 1873 that the French engineers succeeded in finding and effecting an entry, and, after much patient labour, discovered the sepulchral chamber, measuring 10 ft. 3 in. in length by 4 ft. 7 in. in breadth. Nothing of value is stated to have been found during the exploration.

To quicken our interest in the other monument we may pass on to the last chapters of Numidian history. Carthage had been crushed, but was destined to rise again as a Roman city. The great kingdom of Massinissa, over which he had ruled for sixty years and had left in a condition of the greatest prosperity, had passed into feebler hands. Jugurtha had opposed the Roman arms and had perished ignominiously. Juba I., his successor, in the bitterness of his heart, and worn out by constant adversity, had perished by his own hands; and now his infant son, a captive in the streets of Rome, was following the chariot-wheels of the ever-victorious Cæsar. The incidents in the career of this little lad are very touching. They shed unusual lustre on the closing pages of Numidian history. His marked intelligence and comely looks won the heart of the great Augustus, who committed him to the care of his sister Octavia, the discarded wife of the ill-fated Antony. Devoting himself to literature and the arts of peace, the young Juba became one of the most learned scholars of his time. On arriving at man's estate, Augustus seated him on the throne of his ancestors, and bestowed on him the hand of Cleopatra Selene, the beautiful daughter of Antony and his Egyptian queen. Wishing, however, to extend the Roman dominion in Africa, Augustus soon afterwards made Numidia a Roman province, and transferred Juba's capital from Cirta, the modern Constantine, to Jol, the modern Cherchel, known in Roman history as Julia Cæsarea. Here, on this beautiful spot, washed by the waters of the Mediterranean, Juba II. built himself a city, and embellished it with magnificent works from Greece and Rome. Here, during a prosperous rule of nearly fifty years, he gathered around him all the celebrities of his time in art and literature, introducing into his kingdom elements of civilisation unknown to the unruly tribes of North Africa. And here, some ten miles east of his capital, on the summit of a lonely mountain, he built a tomb of gigantic dimensions that was to contain the ashes of himself and his Egyptian queen. The points of resemblance between this monument (see lithograph) and the earlier one already described are very striking, leaving no room for doubt that the one furnished the idea of the other. They have the same graduated and truncated cone, and the same number of engaged columns in the ornamental podium. The proportions, however, are totally different, and the architectural details bear no resemblance. The diameter of the podium or cylinder, which is polygonal, is 198 ft., standing on a square stone platform, 210 ft. each way. The engaged columns are of the Ionic order, with Attic bases and capitals of a Greek type, and surmounted by a frieze and cornice which, as far as one can gather from the scattered fragments, had only a slight projection. One of the capitals, partly taken from a sketch by Bruce, reproduced in Sir Lambert Playfair's work, "Travels in the Footsteps of Bruce," is here given. The cone is composed of a series of steps, each 22 in. high, terminating in a platform similar to the Medrasen. The total height was originally about 130 ft., but the top courses of masonry having been thrown down, the monument at the present time does not exceed 110 ft. At four places in the colonnade, corresponding with the cardinal points, are false stone doors, 14 in. thick, and about 20 ft. high. The entrance to the tomb, which is under the eastern false door, was discovered by MM. Berbrugger and MacCarthy in 1866. The plan of the monument, with its spiral gallery and sepul-

chral chambers, is taken from the elaborate notices and measurements by those eminent Algerian scholars. After a descent of seven steps is the commencement of the gallery, averaging 6 ft. 6 in. in width and 7 ft. 10 in. in height, and having a total length of nearly 500 feet. The gallery terminates in two vaulted chambers, 15 ft. high. The first, measuring 13 ft. by 4 ft. 9 in., is commonly known as "The Chamber of Lions," on account of a rudely-sculptured lion and lioness on the doorhead. The second, or central one, measures 13 ft. by 9 ft. 6 in. Stone doors, formed of single stone slabs, fitting loosely and moving in grooves in the jambs, shut off the two chambers as well as the gallery. There are niches at intervals in the walls of the gallery to receive lamps, and in the central chamber are two niches for similar purposes or for cinerary vases. Outside and about 10 ft. in front of the entrance are indications of a raised stone platform, where, according to M. Berbrugger, the ceremony of cremation was probably performed, and where the funeral urn or ossuary was deposited. The external masonry of the monument is of hard coarse limestone, but the interior filling is of tufa, solidly constructed. The courses of stone are laid with great regularity, breaking bond from top to bottom. They were put together with metal cramps, which, of course, have entirely disappeared, though the mortices in the blocks to receive them are very conspicuous. The masonry of the gallery and the chambers is still in good preservation, having been constructed with large blocks of squared and dressed limestone, and finely jointed. Mortar, if used at all, must have been very thin, and the gallery was apparently faced with a coating of plaster. The dilapidated condition of the monument externally is attributable to numerous unsuccessful attempts to penetrate the interior in search of treasure, more than once with the aid of artillery. So solid is the construction that, even in its exposed situation, it might have resisted the wear of nearly nineteen centuries and remained fairly perfect to the present day.

During a very long period succeeding the Roman occupation of North Africa, when the country was overrun successively by Vandals, Byzantines, and Arabs, the traditions associated with this monument, and the purposes of its erection, seem to have been lost sight of. So recently as the time of Shaw, the traveller, it was known by the name of *Malta-pasi*, or *Treasure of the Sugar Loaf*. How it came to receive the absurd appellation by which it is now universally known, "*Le Tombeau de la Chrétienne*," is not difficult to explain. Hear what M. Judas, a learned Orientalist, says on this subject. The term *Kub-er-Roumiah* of the Arabs is the ancient Phœnician designation which, taken in its original sense, means "*Tombeau Royal*." The natives, instead of translating this foreign word *Roumiah* as they ought to have done, have given it the same meaning as a similarly-sounding word in their own language, *Roumi*, viz., "*Strangers of Christian origin*," the feminine being *Roumiah*. And the French mistranslation originated in a misinterpretation of a detail in the architecture, the stiles of the panelled stone doors being mistaken for crosses. Hence it was inferred that such a tomb must have been that of a Christian! "*The name is preserved*," says M. Judas, "*but nevertheless we must protest against its absurdity*." Leaving this tangle of French and Arabic, we turn with satisfaction to the pages of Pomponius Mela, a geographer of the first century, who had seen this monument, probably in the lifetime of Juba II., and we find it designated in simple language as "*Monumentum commune regie gentis*." That it was intended as the common sepulchre of Juba and his descendants is clear enough; but his dynasty was short-lived. His only son, Pompey, who succeeded him, took up arms against Cæsar, and paid the penalty of his rashness by the sacrifice of his kingdom. His daughter, Drusilla, who died in a foreign land, had



married Felix, the Governor of Judea,—a name so familiar to us in the life of St. Paul. So remarkable a structure has given rise to numerous legends, which may be found in most works on Algeria, in the elaborate treatises by MM. Berbrugger and MacCarthy, and in the pages of that excellent book, already referred to, by our learned countryman, Sir Lambert Playfair. It is worthy of mention, before concluding the notice of this monument, that vegetation is so luxuriant on its conical top that M. Jourdain, the naturalist, found ample matter for a pamphlet published a few years ago, entitled "Flore murale du Tombeau de la Chrétienne."

The value of both these edifices must be estimated, not on the ground of any special artistic merit, but simply as links in a long chain of architectural history. The earlier one helps to bridge over the gap that severs eclectic Egyptian from Greek art. The latter, erected some two centuries later, though based on the same lines, shows considerable advance in architectural treatment. Its excellent proportions, and the extreme ingenuity of the plan, entitle it to a place among the great monuments of its kind. It possesses two essentials of noble architecture, simplicity and dignity,—elements that are worthy of notice in these days, when their absence in architectural design is too frequently conspicuous. This is not the place to write a biography, however short, of the monarch whose remains were deposited in this remarkable edifice, but a passing record of the labours of this great African may quicken our interest in his monument, and help to throw light upon a somewhat obscure page of ancient history. Had Juba II. lived in other times, his career would have entitled him to a far more conspicuous position, but the dazzling rule of the Cæsars and the stirring events in other parts of the world at the commencement of the Christian era, cast into the shade the unobtrusive labours of so peaceful a monarch, affording but few materials for the historian. Such was his popularity, during a long reign of nearly half a century, that the Athenians raised a statue in his honour, and the tribes of the desert worshipped him as a deity, "Et Juba, Mauris volentibus, deus est." Of all his numerous literary works fragments only remain. It is enough that Pliny, Strabo, and other less prolific writers bear ample testimony to the value of his researches, and quote freely from his histories of Rome and of Arabia, and his numerous treatises on various subjects. It is enough for us that, after the lapse of nearly nineteen centuries, we have before us the remains of this remarkable edifice, an enduring monument of the most learned, if not the greatest, among Numidians. A. G.

#### NOTES.

**T**HE "first report" of the Westminster Abbey Commission, which is just issued, is, in fact, no report at all in the proper sense, but merely the evidence of witnesses so far as it has been taken, accompanied by explanatory plans and one or two sketches exhibiting different ideas of Mr. Pearson's. The evidence contains a great deal of interesting matter, especially as to the history of the interments in the Abbey; but the main interest of course lies in the architectural propositions which have been made for the proposed erection of a monumental chapel. The general tendency of the evidence leads to the conclusion that Mr. Shaw Lefevre's preposterous scheme of an enormous hall at right angles to the Abbey, and almost dwarfing it, may now be considered practically dead. Of what may be called outsiders' plans (not by the architect to the Abbey) there are three appended to the report. The first is by Mr. Somers Clarke, and shows a very large five-aisled building tacked on eastward of the chapter-house, and with a grand entry from Old Palace-yard—the connexion with the ancient part of the Abbey being made by the Poet's-corner door, which is included within

the new building. The plan does not indicate how the great Chapter-house buttresses are to be disposed of in the new building. Mr. Tarver has a plan showing a corona of small chapels between the buttresses of the Chapter-house and entered from it, and Mr. Seddon one containing this feature along with a chapel reaching eastward to the corner of Abingdon-street, and connected with the Chapter-house by a corridor. These are ingenious, but as to the first it may be said that it is too small and scattered a way of doing it, and that the Chapter-house is not the proper place for a monumental chapel; and as to the second the same objection applies, with the addition that the larger chapel is too unconnected with the Abbey. The latter objection applies to Mr. Pearson's plans for a chapel to the east of the Chapter-house; they can never appear as part of the Abbey. But he suggests a scheme for a new north aisle to the nave, which really seems to meet the required end, namely to have a space for monuments which will really seem part of the Abbey-church and be in close connexion with it. We are of opinion that the connexion might be architecturally even closer than has been indicated in Mr. Pearson's plans and evidence; but this is a point we prefer to consider more at leisure. But if the custom of honorary funerals to eminent men in the Abbey is to be continued, it is indispensable to the idea of the thing that the addition should seem a part of the church and not a separate building, and Mr. Pearson's north aisle is the only suggestion yet made which in any degree promises to meet this condition.

**O**N July 12 we drew attention to the fact that the County Councils of Lancashire and Cheshire and several Corporations of Lancashire had applied to the Local Government Board for a provisional order to form a "Watershed Board," which should have power to prevent the pollution of the Irwell and Mersey and their tributaries. On the 12th inst.—five months after the application was made—an inquiry into the subject was held in Manchester by Colonel W. M. Ducat, R.E., and Mr. T. W. Thompson, Inspectors sent by the Local Government Board. Representatives attended not only of the County Councils of Lancashire, Cheshire, and Derbyshire, and the Corporations of Manchester and thirteen towns, but also of about forty-five Local Boards and several Unions and Sanitary Authorities. The district now proposed to be placed under the administration of the Board contains 568,703 acres, and has a population of 2,163,942. It is patent to every one who glances at the Irwell, in Manchester, that it is grossly polluted with both sewage and manufacturing refuse, and the state of the Ship Canal, which is to be supplied with water from the Irwell and Mersey, will probably, in a few years, be truly sickening, unless the desired powers are granted. Salford, too, with its seventy-two acres of docks filled with foul, stagnant water, cannot but have an increased death-rate. Objection was taken by a few representatives to certain details of the scheme: but about the necessity of doing something to purify the rivers from source to sea, there were not two opinions. It is to be hoped that the Local Government Board will not longer delay so needful a work.

**S**IR JOHN LUBBOCK had a congenial task on the 12th inst. in presiding over the first regular meeting of the newly-constituted London Conciliation Board. This is the outcome of a proposal made at the annual general meeting of the London Chamber of Commerce in March last, and the rooms of the Chamber are placed at the disposal of the new Board for the first twelve months. The Board consists of nearly equal numbers of representatives of capital and labour, the chairman being selected from the employers on the Board, and the vice-chairman from the employed. Among the former appear many pro-

minent names, while the latter, elected by various groups of trades unions, includes representatives of a great variety of employments; and though it cannot be said that all classes of employers or employed are represented, yet the Board, as constituted, is competent to deal with questions affecting a large proportion of the numberless industries of the metropolis. Sir John Lubbock himself is the nominee of the London County Council, and Mr. Fenwick, the labour M.P., will probably join the Board to "preserve the balance of power." In addition to conciliation committees for particular trades, a standing committee for emergencies and general purposes has been appointed, and the course of procedure arranged for dealing with disputes that may arise. This is a step in the right direction, and, should the movement prove as successful as its promoters hope, the proceedings of the meeting may be looked upon (as the chairman remarked) as possessing almost a historical character.

**T**HE opinion we recently expressed as to the probability of the Board of Trade objecting to be overwhelmed with returns relating to railway rates was justified by the reply given by the President of the Board to the Lancashire and Cheshire Traders' Conference last week. Alluding to a certain return which a deputation from this body urged him to require from the Railway Companies, Sir Michael Hicks-Beach stated that he did not believe it to be necessary from any point of view. He doubted both whether it could be done, and whether, supposing it could be prepared, it would be of any service. At the same time, the Railway Companies will have to give some further information, as the Board are far from satisfied with the statement of prospective losses which they have rendered. The officials of the Department were very busy over this matter last week, conferring nearly every day with one or more deputations—chiefly from the Railway Companies. All the principal Companies have now laid their views before the Board, and endeavoured to explain and substantiate the statements of estimated losses already referred to. It appears to us that the net result of all this will simply be to satisfy the Board that, in steering a middle course with regard to most of the points in dispute, they did the best thing possible under the circumstances;—and, perhaps, to give them the impression that some of the objectors "do protest too much."

**T**HE new Cathedral for Berlin, which is now the subject of much talk, and for which the designs are being prepared by Professor Raschdorff, would probably cost, if carried out, somewhere about half-a-million sterling. The idea of a great Cathedral for Berlin, it may be observed, is no recent one, Frederick I. of Prussia having already, in 1703, ordered his Court architect, Schlüter, to work out the designs for a Cathedral. This King's very far-reaching ideas not being feasible at the time, Berlin's present small "Dom" was erected, 1747-1750, according to designs by Boumann, and by special command of Frederick the Great, whose descendant, Frederick III., had a restoration and extension made (1816-1817) by Schinkel, who, however, at the same time, had orders to prepare designs for a grand Cathedral to be placed on a more suitable site. Frederick William IV. then took the Cathedral idea energetically in hand (1840), going so far as to have the foundation-work commenced. The work, which had to be stopped for pecuniary reasons, was not forgotten by the late German Emperor, William I., at the time King of Prussia, who, in 1867, took the matter in hand by opening a competition for new designs, which competition, although without direct result, turned out to be a highly interesting one. The fifty-three designs sent in at the time (the estimates for which reached sums between 9,000,000 and 12,000,000 marks)



nearly all showed a central disposition, with a cupola at the crossing. After the awarding of the ten prizes no steps were taken in the Cathedral question for some time, until the late Emperor Frederick III., then Crown Prince, had designs worked out according to his own ideas by the now well-known architect, Raschdorff, whose efforts have found approval under the new régime, and who will, probably, sooner or later, receive the commission for the erection of the building, the present Emperor having apparently made up his mind to act according to the wishes of his deceased father in this matter.

IN the German Budget for 1891-92, which has now been put before the Imperial Reichstag for approval, it appears that no less than about 84,500,000 marks are required for building purposes, and that of this sum the military administration will require some 32,000,000, the naval authorities some 3½ millions, the administrations of the Imperial Post Office and Imperial Railroads 4½ and 7 respectively, whilst this year's vote towards the cost of the North Sea-Baltic Canal will be for 29,000,000 marks, and the one towards the harbour works at Hamburg 4,000,000. According to the official contemporary "Centralblatt," the Prussian Government has during the year 1889 had the superintendence of the erection or alteration of 525 buildings. Among these there are 43 churches, 90 elementary and 9 ordinary high-class schools, 37 buildings belonging to the university system, 7 for scientific collections, and 3 to be used as hospitals. The Government administration required 14 new homes, the town and provincial law courts numbered 23, and 23 prison buildings were in hand.

THE case of "in re Griffin," which recently came before the Court of Appeal, illustrated rather vividly the speculative builder's "road to ruin." It is unnecessary to go into all the details of this case, but it may be mentioned that in the autumn of 1888, Griffin, the bankrupt, purchased half-an-acre of land at Northwood, Middlesex, for which he gave 135*l.*, and began to build seven cottages upon it, upon which there was a loss of 573*l.* But the noticeable point about this affair is "that," as the Master of the Rolls stated, "at the time the bankrupt entered on this building business he had no money." It is hardly surprising, then, that the Court concluded that the bankrupt had engaged in rash speculation which contributed to bring about his bankruptcy, and by way of punishment suspended his discharge for twelve months. This, indeed, is no very severe punishment, for, after all, the time is soon gone, and then fresh speculations can be begun. The unfortunate part of such business as this affair discloses, is, that obviously no good building can be done under such conditions. The sole object of such a speculator is to get the building completed as cheaply and quickly as possible, to sell it as soon as possible, and before its defects can be discovered, and then, without thought either for the purchaser or his own credit, to seek elsewhere fresh fields for his nefarious enterprise.

THE judgment of Mr. Justice Romer in the case of the Attorney-General v. Edwards, touches on a point of some interest in regard to the interpretation of the Public Health Act in regard to lines of frontage. The action was in the form of an information at the instance of the Corporation of Bristol, as the Urban Sanitary Authority, against Sir George W. Edwards, to restrain him from continuing to erect two new shops on his land abutting on Park-row Bristol, so as to project beyond the front main wall of the Bristol Asylum for the Blind, which was the adjoining building. The contention was that this was in contravention of section 3 of the Public Health Act, 1888, which provides

"That it shall not be lawful in any urban district, without the written consent of the urban

authority, to erect or bring forward any house or building in any street, or any part of such house or building, beyond the front main wall of the house or building on either side thereof in the same street, nor to build any addition to any house or building beyond the front main wall of the house or building on either side of the same."

The defence was that the wall of a building standing back from the main road and in a garden of its own could not be regarded as intended to mark a line of frontage beyond which an adjoining building was not to project. Where the building is some distance back, this seems the interpretation consonant with common sense at all events, and Mr. Justice Romer, though acknowledging a difficulty in the case, has ruled that it is correct in law, in the present case, at all events. As reported in the *Times* he said:—

"Was the asylum a building in the same street? In one sense it was. It might be said to be in the same street just as Holland House might be described as being in the Kensington High-road. But was it in the same street for the purposes of section 3? His Lordship thought not. There clearly must be some limits—that was admitted—to the expression 'in the same street.' For instance, where a house, though numbered in a street, was built 100 ft. back in a garden, it could not fairly be said to be in the street. Taking what was, perhaps, an extreme case, his Lordship did not think that Holland House was, for the purposes of the Act, in Kensington High-road. If a house was only separated from a street by a small strip, 1 ft. or 2 ft. wide, it could not be said that the house was not in the street within the meaning of the section. The difficulty here was that the asylum was not at a long distance from the street, and it was difficult to say whether it was so far off as not to be in the street. Now, in considering whether it was in the same street, the asylum must be looked at as a whole. One could not rely on the solitary fact that the south wall of the east wing was only a short distance from the street. Was the building as a whole in the same street? His Lordship looked at the position of the centre or main part of the building and both the wings. He noticed that the building was in private grounds, and surrounded by trees. The grounds might at any time be swept away from the public and used as a purely private garden. Looking at the building as a whole, his Lordship had not been satisfied by the relations that it was in the same street within section 3. Lastly, it had not been shown to his satisfaction that the south wall of the east wing was the front main wall of the building. Looking at the asylum again as a whole, was it right to pick out the end of a wing and say that was the front main wall? Why should not the end of the west wing or the south wall of the main central portion be considered? Having regard to all these things, his Lordship thought the relations had not shown that the south portion of the east wing was the front main wall. Therefore, the information failed, and must be dismissed."

This seems to leave the matter, however, open to reconsideration in each future case that may arise, according to the distance of the building from the street. This is not a very satisfactory position for building owners, and seems to point to the necessity for a further legal definition of the expression "in the same street."

WE hear that Mr. T. Fairman Ordish, F.S.A., formerly editor of the *Antiquary*, has undertaken to prepare an edition of Stow's Survey, upon a more extended scale than that of Mr. Morley's volume recently issued as one of the Carbrooke Library series. We gather that, whilst Mr. Ordish does not propose to supplement the survey with the events of the past 300 years, he will annotate the text so as to indicate what features of the town which Stow knew have remained to this present day, and how much has disappeared. The text and notes, on these lines, are to be accompanied with appropriate illustrations.

THE Edinburgh Sick Children's Hospital has been abandoned, owing to an outbreak of typhoid fever among the nurses and patients, and the establishment has been removed to the Morningside College, at Plewlands, to the south-west of the city. The building which has been abandoned is situated immediately to the west of the Royal Infirmary, and consisted of what was originally a suburban villa, to which was added an additional story and wing. The

Morningside College was erected for a hydropathic establishment, but stood unoccupied for some time, when it was utilised as an educational establishment. This, too, having proved a failure, the building has been applied to the purposes of a hospital, for which it is better adapted than the premises that have been abandoned. The situation is elevated and open on all sides, surrounded by several acres of pleasure grounds. The accommodation is ample, the rooms airy and comfortably heated. The little sufferers will benefit by the removal. The number of patients in the Hospital at present is about sixty, and the staff consists of sixteen nurses and two resident doctors. The College has been merely taken on lease, and the Directors leave for further consideration whether a new hospital shall be erected and the site which may be chosen. We are informed that there are not sufficient funds at command for the erection of an entirely new hospital, which would be undoubtedly the proper course to follow. But the Directors, we learn, intend to appeal for funds to enable them to erect a new hospital on a new site.

SO much is being said and written at the present time on the subject of that scourge of our race, pulmonary consumption, and of Dr. Koch's alleged specific for it, that we should not venture to allude to it now but for the fact that that aspect of the question which is concerned with what may be called preventive sanitation has been generally overlooked. In the new number of the *Asclepiad*\* Dr. B. W. Richardson briefly discusses the subject. It is not within our province to discuss the medical aspect of the question, but we may perhaps be allowed to quote the following passages from Dr. Richardson's article, which appear to us to contain a very timely warning against premature conclusions on the subject:—

"Of late the idea that pulmonary consumption is a parasitic disease is revived. The lung infested with hosts of a specific bacillus is supposed to be destroyed by them or by the secretion which they eliminate; and the mode of cure is expected to be found in a lymph or poison which shall kill the bacillus without injury to the patient.

At the present moment the general press is filled with reports and anticipations of such a kind that the uninitiated in the mystery of disease are beginning to see an immediate future when rithmies of pulmonary, which next to alcoholic disease stands highest as a cause of mortality, will practically be wiped off the blackboard of death, and one of the most fatal maladies of past ages be known no more. This were indeed a consummation devoutly to be wished. But scientific medicine is conservative and careful before she speaks a word; and the more so because in her too ready acceptance of speculative practices in former days, she has seen reason to become wary and chary of belief. Some of her children run after new remedies and false gods fast enough; and many, no doubt, will run after this new promise long before there is sufficient evidence either for its establishment or its delegation to the shades of departed fallacies. Letting these pursue their own course for success or discomfiture, the prudent will wait not weeks nor months only, but years, before they come to a conclusion that shall mean an affirmative and historical success or failure. For the success of the mode of treatment attributed to Dr. Koch, but claimed already by some rivals of his school, can be proved by one proof alone, namely, the effect of the practice on the death-rate."

Then, coming to the question of the effect of preventive sanitary measures on this disease, Dr. Richardson writes:—

"Up to this time pulmonary consumption has had a high, though declining, death-rate, on which no defined line of curative treatment has had any obvious effect. The figures which indicate the death-rate will show, therefore, from date, the effect of the new mode of treatment."

In order to arrive at perfectly correct returns, many details will, however, have to be taken into account. First and foremost, it must be remembered that consumption is now on the decline from sanitary improvements alone. In 1881 the late Sir Edwin Chadwick joined me in making a calculation, by which we estimated the mortality from consumption in England in the year 1880, in order to compare it with the mortality of the disease in England during the year 1847, the space of thirty-

\* No. 28, Vol. VII. London: Longmans, Green & Co.



three years being marked by moderately advancing sanitation. From that comparison we learned that pulmonary consumption had decreased in the proportion of  $3\frac{1}{2}$  per cent. of the deaths from all causes; that is to say, 12-57 persons died from it in 1847 to 9-12 in 1880. During the past ten years the decrease has been going on at a more rapid rate, though the figures are not yet at command. This must all be taken into account here, in estimating the assumed evidence of benefit from new treatment of a specific order."

A PAPER by Mr. L. d'Auria on the force of impact of waves and the stability of the superstructure of breakwaters is to be found in the November part of the *Journal of the Franklin Institute*. Great difficulty is experienced in determining the safe limits of construction of marine works, subjected to the action of breaking waves, on account of the ignorance prevailing in regard to the magnitude of the force of impact of such waves. Mr. L. d'Auria bases his method on a well-grounded scientific principle, namely, that the amount of energy which is necessary to cause the propagation of a wave is equal to the energy which such a wave would require if it had to be moved *en masse* with its velocity of propagation upon a frictionless level surface, and he deduces from this a formula for the maximum force of impact of the wave per lineal foot of superstructure to be,—

$$F = \frac{\gamma k^3}{2g}$$

where  $k$  is the height of the wave measured from crest to trough,  $\gamma$  the weight of one cubic foot of sea-water,  $v$  the velocity of propagation, and  $g$  the acceleration of gravity. As an example, assume the height of the waves  $k$  to be 12 ft., the velocity of propagation to be 40 miles per hour, or 59 ft. per second, then  $F=40,500$  pounds.

REPLYING to a question put by Mr. Cavendish-Bentinck in the House on the 5th inst., Mr. J. W. Lowther stated that by a scheme framed by the Charity Commissioners, under the City of London Parochial Charities Act (46 & 47 Vict., chap. 36), a sum of 41l. per annum has been set apart for the maintenance and repairs of St. George's, Botolph-lane, Church, together with another annual sum of 117l. for cleaning and public worship. Mr. Lowther is reported to have added that "in view of the fact that the church is not of primary architectural interest, and of the general condition of the parish, and that the Commissioners are advised that 2,700l. would be required for the church's restoration," the authorities did not feel themselves to be justified in dealing otherwise therewith, as a special case under clause 14 of the statute. Mr. Ewan Christian acted as adviser to the Commissioners in re St. George's Church, at the corner of Botolph and George lanes, which was built in 1673-4, at a cost of 4,509l. 4s. 10d., after the designs of Sir Christopher Wren, and has since served for the united parishes of St. Botolph Billingsgate, and St. George, which are named in the second schedule of the Act of 1883. In his "Churches of London" (1889), the late Mr. George Godwin directs attention to what is its chief beauty, the tower:—"It possesses," he says, "two characteristics of Wren's churches,—a tower rising at once from the ground, and a solid unbroken basement story conferring stability in appearance on the whole edifice." The tower, having a simple, albeit, very pleasing, outline, is 16 ft. square at base, has three stages, of which the second and belfry stages are not marked externally save by the windows, and is finished with a plain cornice and a panelled parapet having angle-piers capped with urn-shaped pinnacles. The body of the church is 54 ft. by 36 ft., and is 36 ft. high. Two Corinthian columns, on either side, set widely apart, divide the nave and aisles. The fabric was repaired and beautified in 1836. On the sword-iron, southern side, was set up a plate inscribed to the memory of William Beckford, twice Lord Mayor of London, who died June 21, 1770.

THE Dr. Williams Library has just been opened again for the use of readers after removal of the books from their former quarters in Grafton-street, by University College, into University Hall, Gordon-square. In June, 1889, the trustees of Manchester New College decided to quit University Hall,—where Dr. Martineau was principal,—and go to Oxford. There they recommenced work in October following, having found a temporary settlement at No. 90, High-street, as vacated by Mansfield College. This latter was founded for Nonconformists at Oxford, by the trustees of the Spring Hill College, Birmingham, about five years ago.\* The University Hall in Gordon-square—a memorial, we believe, of the passing of the Dissenters' Chapels Act—was erected after the designs of the late Professor Donaldson, in 1849. It has now been altered and adapted for the purposes of the library, and the librarian's private rooms, under the superintendence of Mr. T. Chatfield Clarke, architect; the trustees accepted Mr. Nightingale's tender of 2,365l. for the work. We gave a brief account of Dr. Williams's trust and library, in a "Note," on September 21, 1889.

THE annual exhibition of drawings sent in in competition for the various prizes at the Royal Academy was held on Thursday, the 11th inst. The architectural portion was not remarkable either for quantity or any originality in design. Such a subject, we should have thought, as a "Country House" would have attracted more competitors for the travelling studentship. Only three sent in designs, Mr. Spooner's, the successful one, being by far the most appropriate in character. The design was for a house constructed chiefly of stone with a bold tower over the entrance, half timber work in the gables of the garden front, and tile-hanging introduced in the offices and a portion of the entrance front. The plan generally seemed a good one, with a picturesque working of hall and staircase. The dining-room appeared small, however, for a house of this size, and the serving-room was rather awkwardly placed with regard to it. The drawings generally were excellent, with a firm line and good freehand work where it occurred. For the silver medal two sets were sent in, showing one bay of the choir-stalls St. Paul's. Mr. Baker, who was placed first, had rather overloaded his small scale drawing with dimensions, especially as a large sheet of details was given as well. A prize of £10 was awarded for planning a "Provincial Picture and Sculpture Gallery." In the design placed first, the space devoted to the hall and vestibules seemed too great and too much cut up. The 25l. prize was awarded to Mr. Alexander Macintosh, and the 10l. prize to Mr. James Cromar Watt, for a design of a "Loggia for Statuary," in which was some excellent freehand work. The Creswick prize for a painting this year was a very popular one, to judge by the number competing. The subject, a passage from Gray's "Elegy," gave a good opportunity for architecture to be introduced, and this was done in a very excellent way by Mr. Ralph Peacock, who obtained the prize.

#### COMPETITIONS.

BOARD SCHOOLS, MIDDLESBROUGH.—At the last meeting of the Middlesbrough School Board a communication was received from the Education Department formally approving of the plans of a block of schools to be erected in Victoria-road. The plan and design of these was accorded a first place in a limited competition, Mr. E. R. Robson, the Architect to the Education Department, acting as assessor. Nine architects in practice in Middlesbrough, Darlington, Hull, Leeds, York, Bradford, and Newcastle were invited to compete, and eight sets of plans were received by the Board. The design placed first by Mr. Robson bore the motto "Vi et Armis," and was bottomed to be the work of Mr. J. Mitchell Bottomley, of Middlesbrough.

\* See the *Builder* of November 3, 1883, for an account of the new buildings, near to Wadham and Keble Colleges, designed by Mr. Basil Champneys.

#### PAST DAYS IN SOME COUNTRY PARISHES.

WHEN churchwardens' registers are well kept they form some of the most interesting records of life in our own country parishes that we can desire, and curious side-lights are sometimes thrown by them, not on church life only, but on the manners and customs generally of past days. Registers, of course, are not always carefully kept, either in the accounts, the statements, the writing, or in the actual care of the books; even in these days, the old parchment-covered volumes are sometimes to be seen lying about, in the vestry or the parsonage, or, as we once saw them, in the tower, thrown aside amidst old bell-ropes and brushes. From too many churches have the old chests disappeared, made in former days for the safe keeping of all the registering books, baptisms, marriages, funerals, and accounts, belonging to the parish; some have decayed from age, others have been sold or taken for other purposes; the early ones were often made with three locks, one key for the parson and each churchwarden, so that unlocking was impossible without the knowledge of the whole trio.

Some time since we looked through some old registers in Norfolk belonging to Sparham parish. The various collections noted, some for first in quite distant places, e.g., Oundle, Northamptonshire, and Teignmouth, South Devon, are interesting. Another was made on January 12, 1680, "toward the redemption of ye captives for Turkey." Thos. Brome, rector, gave 3s., and the amount altogether came to 8s. 2d., the sums vary from 1d. to 1s.; the note is signed Thos. Brome, and the churchwardens mark crosses. These collections were generally made in obedience to a King's (or Queen's) letter or brief, which authorised such in every village in England, to rebuild churches, restore loss by fire, &c. By stat. 4 Ann, c. 14, churchwardens are to collect money upon these briefs, which are to be read in churches, &c., and the sums collected to be indorsed on the brief in words at length, and signed by the minister and churchwardens, after which they shall be delivered, with the money collected, to the persons undertaking them, in a certain time, under the penalty of 20l. A register is to be kept of all money collected, and the undertakers, in two months after the receipt of the money and notice to sufferers, are to account before a Master in Chancery appointed by the Lord Chancellor. Such briefs have now fallen into disuse, the last dating more than forty years ago.

In 1538 the Guildhall M.S. Journal states that the Corporation of London, for certain reasonable and necessary considerations, assessed the wages of agricultural and other labourers at 7d. and 8d. the day, classing them with carpenters and masons. Labourers employed on Government works in the reign of Henry VIII. never received less than 6d. a day, and frequently more. Sixpence was also the lowest daily pay of the soldier. In Elizabeth's time, wages were increased by about one-half as much again.

The following accounts from the Sparham register show something of the rate of wages in 1690:—

	£	s.	d.
"Pd. to Augustine Cooke for work done about y <sup>e</sup> bells and Church	11	2	6
"Pd. to y <sup>e</sup> smith Tom Buxley for worke	5	0	0
Spent on Holy Thursday (beating bounds?)	0	3	0
For y <sup>e</sup> surplice washing	0	1	0
For Bread and Wine	0	3	1
"Pd. to y <sup>e</sup> visitors (i.e., Diocesan)	0	4	6
For males	0	1	2
Given to a passenger	0	0	2
Spent at y <sup>e</sup> putting out of the Bells	0	1	6
Spent at Cawston Court	0	1	6
Laid out for lime	0	4	8
Laid out for lead	0	5	6
Laid out for ropes	0	4	6
For fetching a load of lime	0	4	0
"Pd. to y <sup>e</sup> carpenter for 3 days' worke	0	9	0
For fetching y <sup>e</sup> Timber	0	4	6
For fetching y <sup>e</sup> Tackling to load y <sup>e</sup> Timber	0	1	0
"pd. for y <sup>e</sup> use of the Tackling	0	1	0
For a load of sand fetching	0	1	0
"pd. to a Passenger	0	0	3
Given to a passenger	0	0	0
Laid out for expenses	0	1	1
Given to a passenger	0	0	2
For fetching a load of timber	0	1	0
Spent on y <sup>e</sup> town's men	0	1	0

\* See Froude's "History of England."



	£	s.	d.
Laid out for charcoal ... ..	0	1	0
For a pound of nails ... ..	0	0	5 1/2
Pd. to John Prior 32 days work ...	2	8	0
Pd. for 1/2 pulling down y <sup>e</sup> ivy ...	0	1	8
Pd. for y <sup>e</sup> pulling down y <sup>e</sup> ivy ...	0	2	0
pd. for a load clay ... ..	0	1	0
pd. for a load of sand ... ..	0	1	4
pd. for 200 brick ... ..	0	5	0
pd. for board planks ... ..	0	0	9
Pd. for work about y <sup>e</sup> Church ...	0	1	6
Pd. for bread and wine at Christmas ...	0	2	8
pd. for whitening y <sup>e</sup> Church and other work ...	1	13	4
pd. Tom Taylor 31 days work ...	2	6	6
pd. him more a half day for y <sup>e</sup> Church gate ...	0	1	0
pd. Abraham Prior 19 days and half work ...	1	9	3
pd. Augustine Cooke ... ..	2	0	0
pd. to 3 passengers ... ..	0	0	4
pd. for bread and wine at Easter ...	0	3	5
pd. for washing y <sup>e</sup> surplis ... ..	0	1	0
pd. for timber for y <sup>e</sup> Church ... ..	3	19	4

Some people are apt to think that taking care of a church is a virtue especially belonging to the present time, but entries such as the above show that at least in some places the parishioners minded their ecclesia. In some years instead of "bread and wine for Easter" being noted, it is "bread and wine for Palm Sunday," as Sparham was held with Foxley, and the celebration at Easter occurred in each parish alternate years.

The following items which that parishioners were well looked after:—

	£	s.	d.
October 15, 1685.			
Laid out for Widow Eglington ...	0	1	9
To Goody Rainer for keeping y <sup>e</sup> Widow Eglington ... ..	0	2	6
For a blanket for Widow Rainer ...	0	4	0
To y <sup>e</sup> bed of Widow Eglington ...	0	2	6
For y <sup>e</sup> bed ringing and grave making ...	0	1	6
For an affidavit about Widow Eglington ...	0	0	6
To Widow Anson for 18 weeks at 6d per week, and 8 weeks more at 1s. y <sup>e</sup> weeks, for all ... ..	0	17	0
Laid out for 2,000 flags for Widow Anson at 3d. 7d. 1,000. And for carriage at 1s. 7d. there, and for all ... ..	0	8	11
To Thomas Turner, when sick ... ..	0	3	0
For removing Goody Rainer's goods ...	0	1	6
for Spelman's child's board ... ..	1	12	6
To Goody Rainer for looking to Goody Anson ... ..	0	2	0

In the King's Lynn register for 1645 is inserted: "Paid to William King, for defacing superstitious epitaphs, 5s." As Blomefield remarks, in his "History of Norfolk," it was too great a reward for so bad a service! It is said to see in Norfolk the terrible "defacements" that have been made,—brasses removed, statuary broken, screens whitewashed, &c.—most of such work dating from the Commonwealth, but some later, from so-called church restoration of the last century. There is an amusing bit in Christabel Coleridge's pretty historical novel of "Lady Betty," where the young Devonshire squire, in 1730, beautifies (?) the church by whitewashing it, putting new square pews, and plasters up the pointed arches. To have had conscientious views in the way of church restoring in an unartistic age seems to us now rather love's labour lost,—i.e., in an artistic way, not, of course, really and truly, as far as the workers themselves were concerned. And, after all, had it not been for the constant repairing and partial restorations of old buildings, we of the nineteenth century might find the very fabric of many churches too tottering and insecure to restore at all. We have seen one church in Norfolk where paint-pots seem to have run riot, as the old road-screen, originally painted with figures of saints, is white-washed, the carved oak pulpit is stained and grained "mahogany," like cheap furniture, and the square pews, ornamented with oak carving taken from other parts of the church, are daubed over with yellow. Fortunately, the beautiful oak stalls in the chancel, and the octagon font, with elaborate carvings of the Crucifixion and the Seven Sacraments, remain untouched. Also the roof still shows treasures of painting and carving, but unless the work of restoration is soon commenced, that seems likely to come down with a run. Sale is one of the most splendid parish churches in England in size, proportions, and architecture. Every one who sees it must wish it could be like the sister church of Cawston, 1 1/2 miles away) cleansed from this spoliation, and its old beauties saved and revived.

A list of the families in each parish was sup-

posed to be kept, as is shown by this certificate for "y<sup>e</sup> poor to go out of one parish to live in another." "We, whose hands and seals are hereunto sett, and churchwardens and overseers of the poor of the Towne of —, do hereby certify that — is legally settled as an inhabitant of the said Towne, and that we do hereby promise that whenever and that as soon as y<sup>e</sup> said — shall fall into poverty, or become chargeable to y<sup>e</sup> Towne — where she now dwelleth, we will receive her and provide for her according to y<sup>e</sup> statute in that case made and provided; to which we have sett our hands and seals this day of —, in the year of his Majesties reign, Anno Domini 1700. Signed and sealed in the presence of —"

In Blomefield's "History of Norfolk" are given lists of the clergy in charge of each parish, from the earliest ascertainable date up to the present time. The first person at Sparham was in 1303. A few are mentioned by some personality, as at Geyton, "John cum Barba" (with the beard), 1318. In the reign of Henry V. the "wages" of a parish priest were limited to 5l. 6s. 8d., except in cases where there was special licence from the bishop, when they might be raised as high as 6l. Till the Reformation, presentations to livings were entirely in the hands of the Pope; private patrons might give away a living, but in the case of each institution a reference was admitted, or was supposed to be admitted, to the Court of Rome". In 1529, it was enacted that pluralities should no longer be permitted with benefices above the yearly value of 8l., and residence was made obligatory under penalty, unless in cases with special reason, of 10l. for each month of absence. Last century pluralities crept in again, owing to the scarcity of men taking orders, which happened from various reasons, unpopularity of the clerical profession, war time, &c., &c.

Before the Restoration, and for some time after, the time and space in preaching the sermon was generally conformable to and directed by the hour-glass, set up in most churches in England, in an iron frame. At Lynn the churchwardens' account notes that a very fine one was procured from Holland, costing 18s. George Herbert's injunction to be patient must certainly have been needed by those unlucky mortals who had to listen for sixty minutes to the firstly, lastly, to continue, in conclusion, and finally; nor, it is believed, were they always let off with "one glass." Church repairs come largely into the following:—"The account of Robt. Taylor and John Graves, churchwardens, for the year ending Easter Tuesday, April 22, 1701:—

#### OUR RECEIPTS [sic].

Received by a Levy made April 17, 1701.	£	4	5	10
Due to y <sup>e</sup> parish upon y <sup>e</sup> last year's acct.	0	1	8 1/2	
				in all ... £4 7 6 1/2

#### OUR DISBURSEMENTS.

July 2, paid at the parochial visitation ...	£	0	3	0
Court fees at Cawston ... ..	0	2	0	
For Churchwarden's dinner ... ..	0	1	0	
For bread and wine on Trinity Sunday ...	0	2	7	
For surplis, table cloth, and napkin washing ... ..	0	1	6	
John Graves' dinner at Cawston Court ...	0	1	0	
Spent by John Graves at the perambulation ... ..	0	2	0	
For two Mats for y <sup>e</sup> steps to y <sup>e</sup> Altar ...	0	3	6	
For Bread and Wine at Christmas ... ..	0	3	10	
Surplis washing at Christmas ... ..	0	1	0	
For Quarterages to Mr. Eglington ... ..	1	1	8	
For presentations ... ..	0	1	6	
for Churchwarden's dinner ... ..	0	1	0	
Will Blakey and boy one day for mending fonts &c. ... ..	0	2	6	
for 15 foot of boards and nails ... ..	0	2	6	
for iron work of Tom Buxley ... ..	0	2	0	
for 30 foot of boards for y <sup>e</sup> chancel seats ...	0	3	3	
Will Blakey and boy half a day ... ..	0	1	3	
for half an hundred of nails ... ..	0	0	4	
for 146 quares of new glass ... ..	0	11	0	
for 24 foot new leading ... ..	0	6	0	
for 4 foot repaired ... ..	0	6	6	
for mortering y <sup>e</sup> glass ... ..	0	1	0	
for two iron bars, and one mending ...	0	0	6	
for fire-bricks and hair ... ..	0	1	6	
for bread and wine at Easter communion ...	0	3	10	
				In all ... 4 1 9

The following entries for the slaughter of birds are curious:—

Dec. 11th, 1824. Pd. Cooke for 4 jackdaws	s.	d.
and 18 starlings ... ..	2	6
March 7th, 1825. Pd. Cooke for 6 jackdaws		
at 3d. each ... ..	1	6

\* Froude.

May 27th, 1825. Pd. Wm. Burton 2 1/2 dozen sparrows	s.	d.
June 11th, 1825. Pd. John Cooke 5 1/2 dozen sparrows	0	10
July 15th, 1825. Pd. Wm. Burton for 6 dozen sparrows	2	2 1/2
July 22nd, 1825. Pd. Wm. Burton for 4 dozen sparrows	2	0
Jan. 27th, 1826. Pd. Wm. Burton for 1 1/2 dozen sparrows and 20 dozen other birds	2	0
	9	0

Then from Michaelmas, 1826, to Easter, 1827, 17. 19s. 6d. was paid for killing seventy-nine dozen sparrows, and from Easter, 1827, to the following Michaelmas, 17. 4s. 6d. for jackdaws, starlings, and sparrows. The last entries in the Sparham registers of the bird destruction is in 1835. The accounts of Easter, 1770, to Michaelmas, 1771, mention that Benjamin Capps, the clerk, was paid 3s. 2d. for thirty-eight jackdaws, and 6d. for caddows, the old name for sparrows; it is sometimes spelt cadder. They are not so mentioned after 1786. Among curiosities of past times, old epitaphs seem to stand out prominently. These in Norfolk are very quaint. At Felbrigg:—

"Here lyeth the body of Thomas Windham, Esq., 3rd son of Sir Edmund, who lived a single life, and died December 20, 1699, to whose memory Sir John Wincham, of Orchard, in Somersetshire, his cousin and heir, hath set this marble.

Live't thou, Thomas! Yes—where with God on high.  
Art thou not dead? Yes, and here I lie.  
I, that with men on earth did live to die,  
Dy'd for to live with Christ eternally."

The next is at Guestwick:—

"Here lyeth entombed the breathless remains of Mrs. Sarah Mills, and Mrs. Rebecca Ward, two sisters-in-law, the only daughters of Mr. George and Mary Mills, of Geytwick, the former of which died June 10, 1696, aged 13; and the latter, May 20, 1702, aged 25.

Under this stone, in casie slumber lies  
Two dusty bodies that at last shall rise,  
Their parted atoms shall again rejoin,  
Be cast into new moulds by hands Divine."

The statement that they were sisters-in-law seems peculiar.

We now conclude this short paper; it is rather disconnected, and the records given are scanty, but it may serve to remind some in charge of old parish lore that such things are interesting and well worth looking through, and, in some cases, may possess a good deal of historical value.

## THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE fourth ordinary meeting of this Institute for the present session was held on Monday evening last at 9, Conduit-street, Mr. Alfred Waterhouse, R.A. (President), in the chair.

Mr. William H. White (Secretary) announced the decease of the Very Reverend the Dean of St. Paul's, *Honorary Associate*, and of Mr. George Robson, *Associate*.

### St. Saviour's, Southwark.

Mr. Aston Webb read the following communication:—

"6, Montagu-place, Montagu-square, London, W., Decemr 11, 1890.

MY DEAR ASTON WEBB.—The modern nave of St. Saviour's, Southwark, has now been completely demolished, leaving only such remnants of the ancient work as were left undisturbed when the old nave and aisles were pulled down. There, I need scarcely say, are of great interest, and present some puzzling features, which, perhaps, some members of the Institute may like to examine. It is not intended to begin any new work until those who are interested in such matters have had an opportunity of seeing things as they were found. Perhaps you would kindly let it be known that Mr. Simpson, the Clerk of Works, will be happy to show the place to any architect who wishes to inspect it, and that if any party from the Council, or from the members generally, would like to pay a visit to the building, I shall be glad to meet them; and I am sure that Mr. Dillman, whose labours in connection with it are so well known, and so valuable, would be very pleased to accompany me.—I am very sincerely yours,

ARTHUR W. BLOMFIELD.

Aston Webb, Esq., Hon. Sec., R.I.B.A.

### Decorative Plaster Work.

The President said that the members would be favoured with four papers that evening, whilst in the corner of the room they would notice that Messrs. Whitcombe and Priestley had already begun to give a practical demonstration of their method of modelling in plaster.

Mr. Edward S. Prior, M.A., read a paper entitled "Design in Plaster." He began by



asking what design in plaster should be, and how architects should design for it, the material having its own province, its legitimate indulgence, and its limitations. If the designers took no account of these they would transgress the limits. They were driven to study first principles, which was the sort of intellectual research which professed designers had to initiate in every department of craftsmanship. That should be left to the professors, and the determination of the capabilities and limitations of building materials should be their work as architects. Though it might seem too ambitious, they should have in their pupils a constant intercourse with real artists, so that they might become familiar with the work. In developing an actual personal acquaintance with the matter they were apt to hold on to some system of rules, and to throw the responsibility of precedent on the examples and masterpieces of established reputation. This system was called the principles of design, a striving after what could be got without thought, and under such conditions they might be excused for having some misgivings whether architects, as at present situated, should attempt the designing of decoration at all. It was found so much more convenient to fall back upon the commercial excitement. Perhaps their conscience revolted, and they struggled out with a miserable compromise, the result being seen in the plaster ornamentation which failed to ornament some of our fashionable buildings. He would ask them not to design under those conditions. Plaster was the most impressionable of all materials which gave an architectural surface. It was responsive to the hand of the craftsman, it had a power of expression and vigour in itself, as was especially seen in the case of the famous house-front at Ipswich, called the Four Seasons. What refinement was to be seen in the Adam ceilings, and what delicate ornament was to be found in the tombs of the Apennine Way! What a satisfying texture the plaster-work of one hundred years ago afforded when compared with the smooth and insipid work which was now substituted for it. Plaster failed to give the final delicacy of surface by which the finest style of æsthetic form was reached; that being reserved for marble and bronze. In design it was essential to have something to express, and if this was not the case the plaster would show up the insincerity of the designer's aspirations. The great deficiency was the passion for the make-believe, and it was much better to go, like Mr. Heywood Sumner, to Nature herself. The face of plaster had no crossing or jointing, no piecing or talling; so here was a material suited for broad architectonic effect. His paper might seem to be a plea for undecorated rather than for decorated plaster work, for plaster undecorated was really adorned the most, as far as architects could adorn it. They should endeavour to escape from the insincerity of their profession, and that night, at any rate, they would associate with workers in plaster, and with artists whose hands were in their crafts. And if architects wished to get hold of their art, they must take their place beside the craftsmen as fellow-workers in the crafts connected with building.

Mr. G. T. Robinson next read a paper on "Stucco Duro, or modelling in Plaster." Plaster-work, he remarked, divided itself into two main divisions, the one in which carbonate of lime formed its basis, and the other where sulphate of lime was concerned. He would confine his remarks to the former of these. This stucco work was much practised by the ancients, and Vitruvius gave the best receipt for its composition. Some of the ancient work rivalled the fineness of metal or gem engraving. He did not intend, however, to dwell upon that, but would hurry on to the revival of the art in the fifteenth century, to show how it had influenced the art of this country. A long lapse in artistic progress occurred in Europe after the fall of the Roman Empire, and working in plaster almost became a lost art. No doubt many of those present would recollect the Winter Exhibition of 1888 at the Royal Academy, where were shown some very fine reliefs in stucco, and there were also some excellent specimens to be seen in the South Kensington Museum. Mr. Robinson then spoke of the revival of the art of plaster-work as an architectural adjunct. This was due to the partial discovery of the Baths of Titus, the artists of the day reproducing some of the ancient ornament. The old grey ground arose from the fact of using *travertine*, putting on a

coat of white, laid with water. The speaker traced the revival of the art at the Vatican, until, he said, stucco duro became completely launched as an architectural accessory. In Venice it made itself at home, that city being now, perhaps, the only place in Europe where stucco duro was carried out by professors of the art. At Mantua an important school of the art was established, and it afterwards made its way into France, being eventually introduced into England in the time of Henry VIII. The art was made use of in the case of the palace called Nonsuch, which the speaker described, quoting from the diaries of Peeps and Evelyn to show what the buildings looked like in their time. The fashion prevailed long in England, and at the end of the sixteenth, and during the whole of the seventeenth century, there was hardly a mansion which did not set forth the art of the stucco-worker, both inside and out. During the reign of Charles I. the fashion of reticulation fell into desuetude, but the covers were full of decorative work, Sparrows House, at Ipswich, being a typical example. After the Restoration, design improved, and the French taste largely prevailed. From the end of the seventeenth to the end of the eighteenth century, a steady influx of foreign workers came to this country, and about the middle of last century a more classical style was shown in ceilings. The reign of Adam then came in, and in Adam free modelling in plaster died. Mr. Robinson pleaded for its restoration, stating that the substance was easy to manipulate and very lasting. The Departmental Schools were turning out a host of modellers, with enough technical facility to do what was needed, and who only lacked direction and guidance, with sufficient humility to do the bionic and mount the scaffold. If a knowledge of what great artists had done would teach them, the study of what the old Romans had done should fire their imaginations to attain excellence in so useful and pleasing an art.

Mr. Heywood Sumner then gave a description of "The Methods of Sgraffito as applied to Plaster-decoration." He said that the branch of plaster work of which he was speaking was called *sgraffito*, which simply meant scratching, and which was quite the simplest form of all plaster work. It was simply scratching a plastic surface before it had set, and, at present, the method in England,—for he did not think he would call it an art,—was principally seen in the sham stone-joints of stucco fronts. He would first begin by showing a panel where they would see various colours, and he desired to demonstrate the manner in which those colours were placed. The groundwork of the panel represented the face of a wall which had been coated with Portland and sand. The first necessity was that there should be plenty of key in it, and that it should be tolerably gritty. When it had set on the wall for three days or so, the cartoon was pinned upon the surface which it was desired to cover with *sgraffito*. After being fixed in its place, the design on the cartoon was first of all defined with lines of small prick holes, and then dusted through with a pounce-bag. The cartoon was next removed, when they found that the prick-marks showed the lines of the design on the panel. If the panel was being worked in two or three colours, it was necessary then to chalk in the different spaces with colour, placing in the middle of each space whatever colour was desired, the plasterer then following on with the coloured cements, filling up what had been marked in, until the result was like a great puzzle or irregular patchwork of colour. In the filling up, it was necessary to be careful about the register-holes of the cartoon and the panel, because these were the key of the colour; if these were missed in any way, it spoilt the register of the colour, owing to the cartoon not being fixed precisely in the same place as before. When the colour was all in its place, it was covered over with a final coat. The whole of the surface of the panel was again covered with the final coat, whatever it might be, the craftsman being exceedingly careful of the register. In the case of the panel exhibited, it was Parian, and he had put a little ochre with the water with which it was mixed, thus getting a somewhat creamy appearance, and taking away the cold appearance of the Parian. The cartoon was again fixed in the same place as before, and pounced through. The design was then cleared, and all that was necessary was to make the edges sharp. Mr. Sumner next

showed how the outlines should be made, being followed up by his assistant, who cleaned up after him. The work was very quick, he said, because the final coating was setting all the time, and in about two hours it would be so hard that it would be inconvenient to clean off a large surface. There were all sorts of small questions which were important, and which only experience could solve, such as when it was necessary to follow on. They could either follow on with the colour two hours after it had been put on, or they could follow on when it had thoroughly set, treating it as if it were a fresh wall. If they followed on when the colour was pretty fresh and had not set, they would get the full strength of colour; and there were endless questions about the final coat. In conclusion, he called attention to a diagram on the wall containing the following recipes for material for *sgraffito* work:—

*Coarse Coat*: 1 of Portland Cement, 3 of Sand

*Colour Coat*: 1 of Portland, 1 of Sharp Sand, 1 of Colour.

*Final Coat*: Parian, or 1 of Selenetic and 1 of Atherthaw lime; or 1 Selenetic and  $\frac{1}{2}$  of Silver Sand.

Mr. Stephen Webb read a fourth paper, entitled "The Proper Treatment of Modelled Work for Plaster as applied to Ceilings or other Large Surfaces and to Friezes." Mr. Webb said that he had endeavoured to confine himself to matters peculiarly applicable to modelling for ceilings and friezes. One important matter for the architectural modeller was that of scale, not as it appeared on the easel, but when it was fixed in relation to its structural and architectural surroundings. This matter of proportion or scale was of the essence of the craft, and nothing would condone the least fault in the matter of scale. There might be people so enthusiastic for their own hands that they might become oblivious to the outer surroundings, but very often if a man were properly trained, and had the necessary previous knowledge, he might do his work well, even when it was not *in situ*. A clever man would benefit by other people's mistakes. The treatment of the modelled work of friezes, as compared with that of ceilings, was a fairly simple matter, and might be quickly disposed of. If an architect had sufficient confidence in his modeller to leave to him the disposition of the purely decorative forms, this might be frequently done without disadvantage. If this happened the modeller would set to work to divide his frieze into the most convenient lengths for repetition, unless he was guided by the architectural lines; or, should there be no pilasters, he would so arrange the divisions that each form which marked the divisions of the frieze should occur at the principal places in the ceiling-mouldings and with the corners. Great care was needed to avoid crossings by the modification of the outlines, and much variety could be had by a studious management of the surface lines. Where the human figure was introduced it should be done with the utmost care, since while a lack of scale in the arrangement might be sometimes overlooked by anybody but an expert, the incorrect modelling of the figure was always disastrous. Assuming the necessary knowledge of drawing the figure on the part of the artist, what was wanted was that he should show how it might be used in some fresh and artistic combinations with other forms, so that a man of cultivated taste might receive pleasure in looking at the composition, and that those of the craft might receive some guidance in the same direction. Coming to the ceilings, they were met at once with greater difficulties and by greater opportunities for the expression of anything they might have to show by means of their art. A remark, which had exerted some influence on his own work, was made to him a good while ago. He had been asked to say something on the same subject at a similar gathering. In the discussion which followed, one gentleman, for whose opinion on most matters connected with art he had great respect, had taken no part, and after the discussion he was anxious to know what that gentleman's opinion was. When pressed, he said roundly that he had never been able to see why people should put any decorations at all on ceilings. From his point of view the gentleman referred to was able to deduce what did appear to be one or two essentially good reasons for the faith that was in him. One was, as he said, that nobody ever looked at the decoration of ceilings as applied to



living-rooms. Another objection was that one of the most important functions of the ceiling was to reflect light downwards, and that this was frustrated more or less by the use of decoration. That did not, however, apply in the same degree to modelled work as to that in which colour was used. The decoration of the ceilings of living rooms was, in a greater or less degree, open to these objections. But, in the case of the first, if one could not see the whole of the ceiling they could see sufficiently large sections to apprehend the motives of the design. It was well to keep this objection in mind, and lay out the forms in such a manner as to avoid all intricate combinations. The modelling should be in character and keeping with all the other decorations of the room, but the treatment in the case of ceilings must be entirely different from that adopted for work in another situation. He felt that modelling in ceilings should not be in the smallest degree assertive, but should be done in such a way that it might serve as an apology for being there at all—requiring, no doubt, great self-repression on the part of the artist. About the best position from which to look up at a ceiling was from an ordinary easy chair, which allowed one to lean pretty well back. Very few men had leisure to contemplate their ceilings until the business of the day was over, and therefore the man who had to live in the house should be somewhat considered. This would naturally suggest that the treatment of the decorative forms should be quiet and reposeful. He considered that the most graceful and manageable forms should be adopted, and that abrupt shadows should be no more used than was absolutely necessary to give expression to the idea. It was well to vary the centre, and the leading object, as far as practicable, as soon as two or three repetitions had been taken place. Referring to surface treatment and texture, his opinion was that a great deal of the time spent in the discussion of these smaller matters, and especially in the case of students, would be much better employed in endeavouring to get a right knowledge of form and a proper acquaintance with the distribution of ornament which should be applied to surfaces. The surface texture might then be left to take care of itself. It was very grievous when, in deference to the prejudices of some one, a real artistic piece of work had to be handed over to the clay-smoother or plaster-carver. Another fruitless waste of labour was the time the modeller gave to acquiring the mannerism of some artist whose artistic peculiarities might have no value whatever. He would have liked to say a few words about the curious tendency shown in modern modelled ceilings to imitate carvings, but he had now reached the end of his space, and he would therefore conclude.

Mr. J. D. Sedding, in opening the discussion, said that as representing the Art Committee he would like to say how extremely gratified the Committee were with the excellent attendance that evening, as showing the strong interest taken in everything that had been said and demonstrated. One could not help feeling that architects were getting a little nearer to the crafts. A great many hard things had been said about architects by Mr. Prior, who, being an architect himself, could afford to say them, but what had been brought home to them very much was the advantage of the art of modelling, which they ought all to possess more or less. He was glad to see so many of their younger brethren present that evening, and he hoped they would spend more of their evenings in learning to model. It would be a great gain for art when they realised the power of designing the largest buildings in the Renaissance style as well as in the Gothic. They had had most beautiful illustrations that evening of stucco ornaments—such things as they were accustomed to in Wren's buildings, but which people would be horrified to see in a Gothic church. He hoped, therefore, that they would open their minds, and be able to go for the Renaissance as well as the Gothic churches.

Mr. Basil Champneys said he was exceedingly glad that the subject had evoked so much interest as the crowded room appeared to suggest. Plaster work was one of those branches of art which had lately been utterly neglected, and which would be exceedingly valuable in the design of the future. He had been very interested in seeing one branch, with which he had been acquainted in theory, being worked out before his eyes, and he considered that a

stance of that kind, in which one had an opportunity of seeing the actual thing done, was better than all the theory in the world.

Mr. George Simonds remarked that the method of executing *sggraffito* work was exceedingly interesting. The only question which occurred to his mind was whether, in going in for such polychrome work, one was not rather running beyond the proper limits of plaster? It seemed to him that in the case of one of the *sggraffito* panels exhibited, the fine lines must be extremely liable to injury, as the material was very fragile, and likely to break away. The oldest *sggraffito* work seen in Italy was very much simpler, being only of two colours, and yet it had suffered when placed out of doors. Something had been said about modelled plaster work for architectural decorations, and about "repeats." The word "repeat" was a word which he very much detested; indeed, it seemed to him the curse of decorative plaster work, especially on ceilings. He recently inspected some ceilings in Harrington-gardens. In one case there was a long, low room with several architectural members, the whole of the ceiling being decorated in a tremendously elaborate way. The result was that the proprietor could not help seeing the ceiling continually, and he would find that the same little boy was running about the ceiling in different parts, but always the same boy. This was extremely unpleasant, and he was afraid there was a great tendency among architects to do that sort of thing. Of course the public demanded a great deal of decoration, but they did not care to pay for it. He very much sympathised with what had been said about the modelling of the figure, for one did see the figure modelled in friezes and ceilings in a very objectionable way; in fact, the rules of relief, even in the rooms where they were assembled, had been utterly set at defiance. The thing was all very nice on paper as a drawing, but as a piece of modelling it was simply ridiculous.

Professor Atchison said that he fancied, from the peculiar pungency of the words which had been quoted by one of the readers of the paper, that they must have been the words of Mr. Brett, who had very peculiar ideas on many subjects. The idea that ceilings should be left untouched was an utterly erroneous view, for nothing gave so great a finish to a room as having the ceiling beautifully modelled. A room admirably decorated in every respect, but with a vast space of white ceiling, gave the idea that people had expended all their money on the walls, and were obliged to put in the ceiling flat. The great charm of the work was not only that it should be artistically done, but that it should be entirely new, though the difficulty lay in the expense being so great. At the same time schools of art were now so common that art work should be comparatively cheap. Mr. Brett was very severe on the modern method of decorative paper hanging. Now, nothing was more beautiful than good ornament, but when it was used with too much repetition it was the most degrading thing possible to put up. The only thing that then redeemed it was the breaks made by pictures and furniture. He objected to the supposition that it was an easy thing to apply ornament, taken directly from nature, to anything, and it was too much used in the present day. The traditional ornament, which had come down from pre-historic times, had gradually received the modifications which a great series of highly skilful and endowed men had been able to give it. A great tendency of modern art was to copy things from nature direct, the only effect of which was to make the thing all over look flabby or wire-drawn. Every great artist who had used plaster had gone to nature, but he had at the same time adapted it for the purpose for which it was intended. The greatest fault generally to be found with modelling in plaster work was that a small piece was done, cast, and put up regardless of the different lights it was likely to be subject to.

Mr. Ralph Nevill remarked that there still remained a vestige of Nonsuch at Reigate priory, in the shape of a mantelpiece. He had always understood that Italian workmen had been brought over by Henry VIII.; but he did not know there was so much evidence as Mr. Robinson had given them of the fact. An antiquarian friend of his in Somerset had informed him of a great number of fine ceilings in the manor-houses of that county. He understood there was an extract of a will extant, executed by the manager of the Italian travel-

ling craftsmen who did the work, in which he bequeathed all his tools and instruments. He had lately come across an interesting class of plaster-work which he did not think had been much noticed. That was to be found in the stone districts, especially of Gloucestershire, where the houses were of stone with mullioned windows, the spaces between the stone-work being apparently ornamented with cast ornaments of plaster, and some moulded by hand for the surface of the walls. Little of this was now left, because it had been destroyed in the course of constant whitewashings. As to repetition, if they could always have ceilings and other things designed out of the artist's head, and varying in shape up to a certain point, it might be nice. But there was a certain point at which it was necessary to have repetition, and where, without it, the design would become wearisome, as in many ceilings of the Jacobean period. He thought it was a horrible idea to put forward that a man must be always staring at everything that was put up in his house, instead of supposing that it should all merge into one harmonious whole. It was also a pernicious theory to advance that the object of the ceiling was to reflect light. With respect to the question of modelling by architects, they must not hurry things too fast, as there was plenty of work for the profession without their taking up modelling. An architect in good practice would do the work in an inferior manner, and it was, therefore, better to employ those who had devoted their whole lives to the craft.

Mr. Arthur Cates said that the attention given to the papers, and the interest with which the subject had been received, had demonstrated the wisdom of the step taken by the Art Committee in this new departure. He believed this would be only the first of a series of similar demonstrations and papers, which would be of an instructive nature, and originate equally useful discussions. The credit of the new departure was due to the Art Committee of the Institute, to its Chairman, and its energetic Secretary, Mr. A. B. Pite. He had, therefore, much pleasure in proposing a vote of thanks to the Art Committee, to the readers of the four papers, and also to the two silent speakers, Messrs. Whitcombe and Priestley, who for something like two hours had been so busy demonstrating their method of modelling in plaster. This he hoped would lead to the restoration of the art in this country, and that by Englishmen.

The motion was then put and carried by acclamation.

Mr. Sumner said, in reply to a criticism, that he had given several colours in the *Sgraffito*, merely to show how many could be used.

Mr. Priestley added a few words in explanation of his method of modelling in plaster.

The President announced that the next meeting, to be held on January 12, 1891, would be a business one, when a ballot would take place, and the awards for studentships, medals, and prizes would be announced.

**SURVEYORSHIP, DROITWICH.**—At a meeting of the Droitwich Town Council, held on Wednesday last, Mr. Bernard Godfrey was unanimously appointed Borough Surveyor. Mr. Godfrey for some time past has been assistant to Mr. Robert Godfrey, A.M.I.C.E., Engineer and Surveyor to the King's Norton Rural Sanitary Authority, and also Assistant Surveyor to the Northfield Highway Board, and Hon. Sec. of the Association of Birmingham Students of the Institution of Civil Engineers.

**DISCOVERY AT BEVERLEY MINSTER.**—A few weeks since, when workmen were excavating for a new rain-water drain from the corner of the north-west transept of Beverley Minster, they came upon the plinth of one of the walls of the octagonal Early English Chapter-house. Further investigations have revealed the foundations and part of the walling of the other sides, as well as the circular base of the central column of the structure. It is evident that the building was of two stories, having been erected like those of Wells, Westminster Abbey, Old St. Paul's, and others, on a vaulted crypt or undercroft. This discovery is of great interest, as explaining the object of the well-known beautiful double-arched staircase in the wall of the north aisle of the choir. The twin doors of the top of this staircase must have led by a short passage into the Chapter-house itself, the low round-headed doorway in the wall below the stairs giving access to the undercroft. When and why this beautiful building was destroyed is quite undecided. It is to be hoped that means will be devised, as at St. Paul's, for keeping these remains of the Chapter-house open and visible.—*Manchester Courier*.





"Castle Garth," Newcastle-on-Tyne.

#### CASTLE GARTH, NEWCASTLE-ON-TYNE.

THE accompanying sketch is one of the old "bits" of Newcastle-on-Tyne, called "Castle Garth." The high-peaked tiled roof that is seen on the sketch is part of the "Castle," which is at the end of the street, while the lantern of St. Nicholas Church fills up the centre of the vista. The sketch is by Mr. J. R. Hutchinson.

**SOCIETY OF ENGINEERS.**—The thirty-sixth annual general meeting of the Society of Engineers was held on December 8, at the Rooms of the Society, 17, Victoria-street, Westminster, S.W. The chair was occupied by Mr. Henry Adams, M.Inst.C.E., President. The following gentlemen were duly elected by ballot, as the Councillors and officers for 1891, viz.:—As President, Mr. William Naeby Colam; as Vice-Presidents, Messrs. Joseph William Wilson, jun., William Andrew Valon, and George A. Goodwin; as other Members of Council, Messrs. Chris. Anderson, R. W. Peregrine Birch, Chas. C. Carpenter, Henry Fajja, C. Nicholson Lailey, T. Bell Lightfoot, William G. Feiro, and Arthur Rigg; as Hon. Secretary and Treasurer, Mr. Alfred Williams; as Hon. Auditor, Mr. Alfred Liss (Messrs. A. Liss & Co.). The proceedings were terminated by a vote of thanks to the President, Council, and Officers for 1890, which was duly acknowledged by the President. The annual dinner was held on the 10th inst., as mentioned by us last week.

#### Illustrations.

##### SCULPTURE PANELS IN REREDOS, ST. JOHN'S, NOTTING-HILL.

THE sculpture here illustrated was modelled in terra-cotta by Miss Emmeline Halse, for the reredos of St. John's Church, Notting-hill, the architectural portion of which was designed by Mr. Aston Webb. The whole was, we believe, carried out in terra-cotta by Messrs. Doulton.

The church being dedicated to St. John, the artist has selected for illustration the three most prominent points of the life of St. John as recorded in the New Testament:—"The Call" when James and John, mending their nets, were addressed by Christ with the words "Follow Me;" "The Commission," when Christ commended Mary to his care with the words "Behold thy mother!"; and the Revelation. The principal panel is not only a good sculptural composition, but the subject is treated with great feeling and expression.

##### TOMBS OF NUMIDIAN KINGS.

THE illustrations of some of these tombs which we publish in the present number, are from drawings by Mr. Alexander Graham, and are fully explained in the article from his pen which will be found on another page.

As will be seen, Mr. Graham gives, on the larger sheet of illustrations, restorations of two of the tombs, with some details and a plan of the tomb of Juba II., and a sketch of the entrance and the adjoining masonry. The "four-panelled door" is an ancient sham door in stone. On the smaller sheet is a general view of the remains of the same tomb as at present existing.

##### ENTRANCE TO THE CHAPEL, BARGELLO, FLORENCE.

OUR illustration shows the doorway to what is now the fourth room of the National Museum, and which was formerly the Chapel of the Bargello. The walls of the chapel were decorated with frescoes by Giotto representing scenes from the life of S. Mary and the Magdalen, and there were also a series of portraits, amongst them being one of Dante. This and the frescoes generally suffered considerably during the period when the building was used as a prison, and the portrait of Dante has lost much of its interest by restoration. The building is of the fourteenth century, the earlier building having been burnt at the beginning of the century. The doorway here given has some good heraldic work.

The illustration is reproduced from a coloured drawing by Mr. H. W. Lonsdale.

##### PANELLING, CHURCH OF ST. VINCENT, ROUEN.

THIS is a portion of a large drawing which gained its author, Mr. Arthur A. Hind, a South Kensington medal for this class of drawing. The carving is a characteristic bit of Renaissance work, not of the highest order, but the frieze shows a free and graceful treatment, and the perpetual variety in the treatment of the panel decoration below is noticeable.

##### ANCIENT WELL-HEADS FROM VENICE AND PADUA.

THESE are illustrations of some of the ancient decorative stone heads or fences to well openings, so many of which were produced in the Renaissance period in Italy, and which are now common objects in museums. The two upper ones in the plate, however, are of a different date and of a more uncommon type, and whether or not originally fired in or near Venice, like the architecture of Torcello their parentage is Byzantine. The other two, the left-hand one especially, are very elegant examples of the better-known type of the Renaissance period. The illustrations are reproduced from drawings by Mr. R. Glazier.

##### THE ARCHITECTURAL ASSOCIATION.

THE fifth meeting of this Association for the present session was held on Friday, the 12th inst., in the meeting-room of the Royal Institute of British Architects, Conduit-street, Mr. Leonard Stokes, President, in the chair.

The minutes of the previous meeting having been read and confirmed, the following gentlemen were elected members of the Association, viz., Messrs. P. Banhof, T. J. Morgan, and A. H. Bamber.

Mr. Cole A. Adams said he rose for the purpose of asking two questions, not for the purpose of raising a discussion, but so as to obtain an answer from the chair. His first question was whether or not *A.A. Notes* was the official organ of the Architectural Association? Secondly, did the leading article in the December issue of that publication express the authorised views of the Committee of the Association?

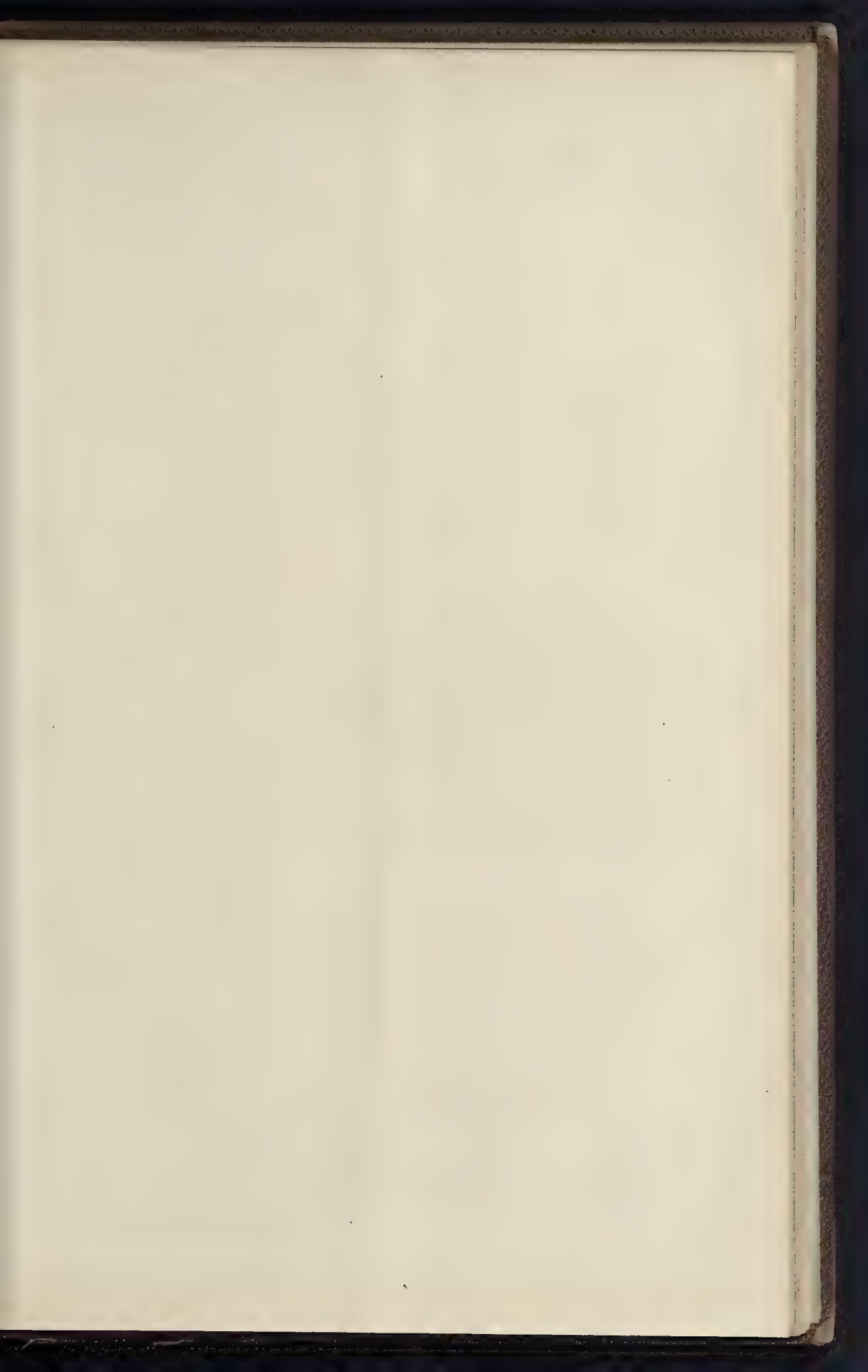
The Chairman stated that the answer he was instructed to give to those two questions was, that *A.A. Notes* is the official organ of the Association, but that the article in question does not give expression to the authorised views of the Committee.

The Chairman then declared the ordinary meeting terminated; and the meeting then became special, to consider the revision of the rules.

The minutes of two previous special business meetings were read, and after some discussion confirmed.

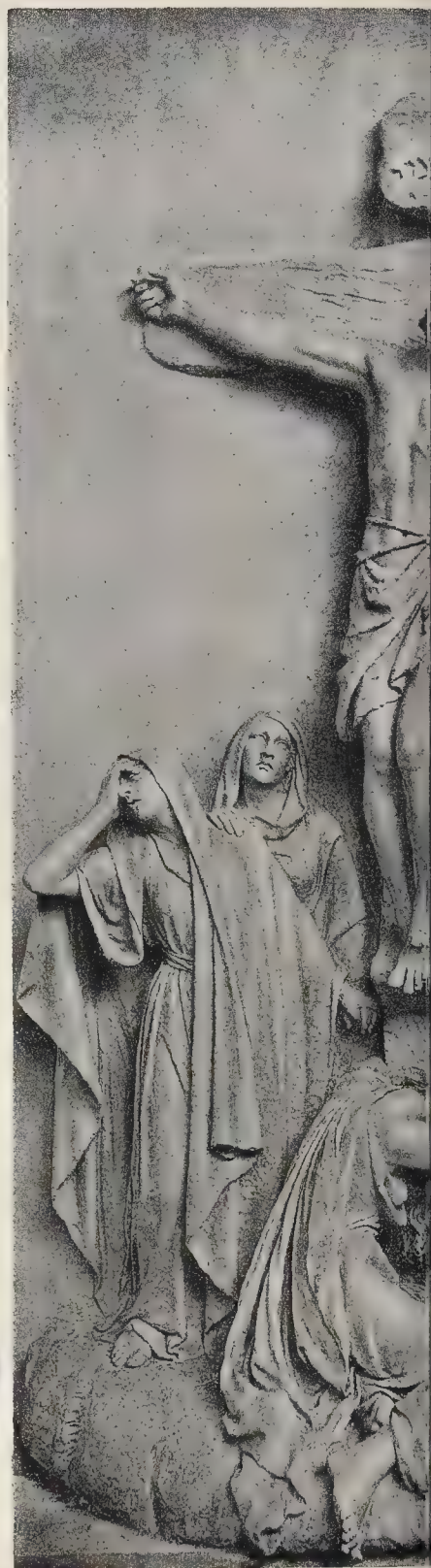
The Chairman said he wished to remind the meeting of a fact which they must keep clearly before them. They had heard from the minutes that a special committee was appointed







1.—THE CALL



2.—THE

PANELS IN TERRA COTTA OF A REREDOS FOR ST. JOHN'S





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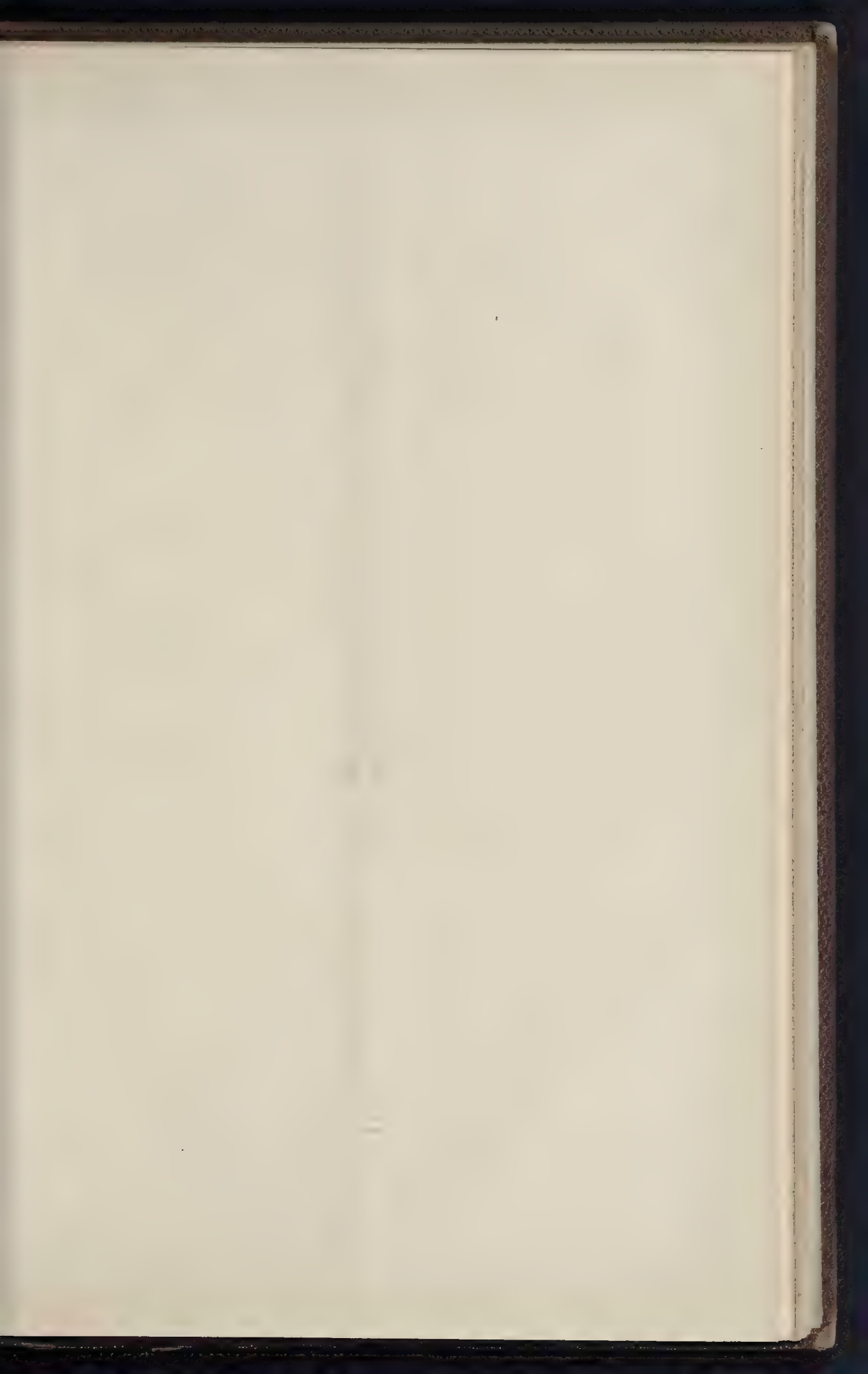
H. NOTTING HILL.—EXECUTED BY MISS EMMELINE HALSE, 1890.



ALL PHOTOGRAPHED BY J. J. MALTBY, LONDON. L. C.  
3.—THE REVELATION.

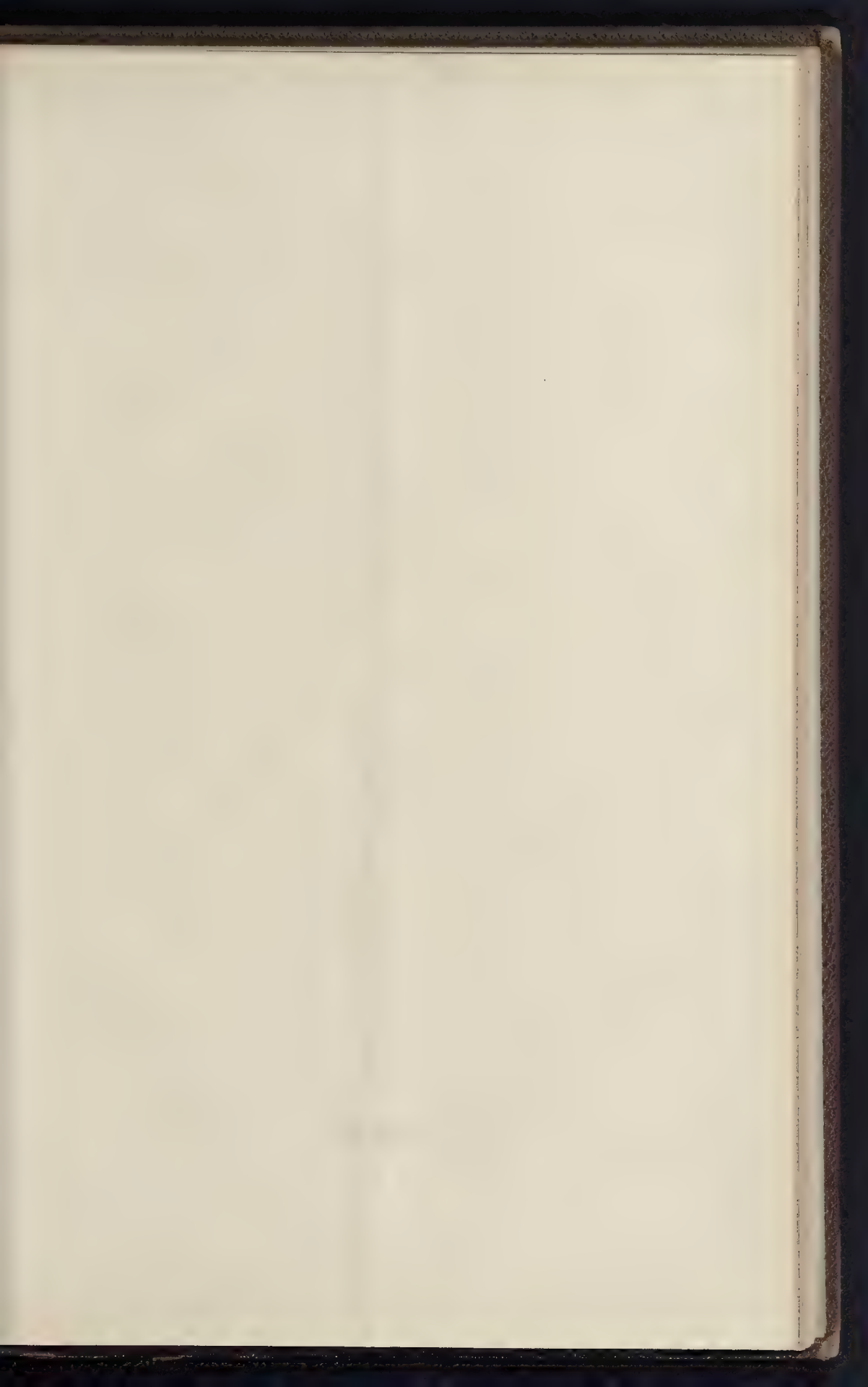










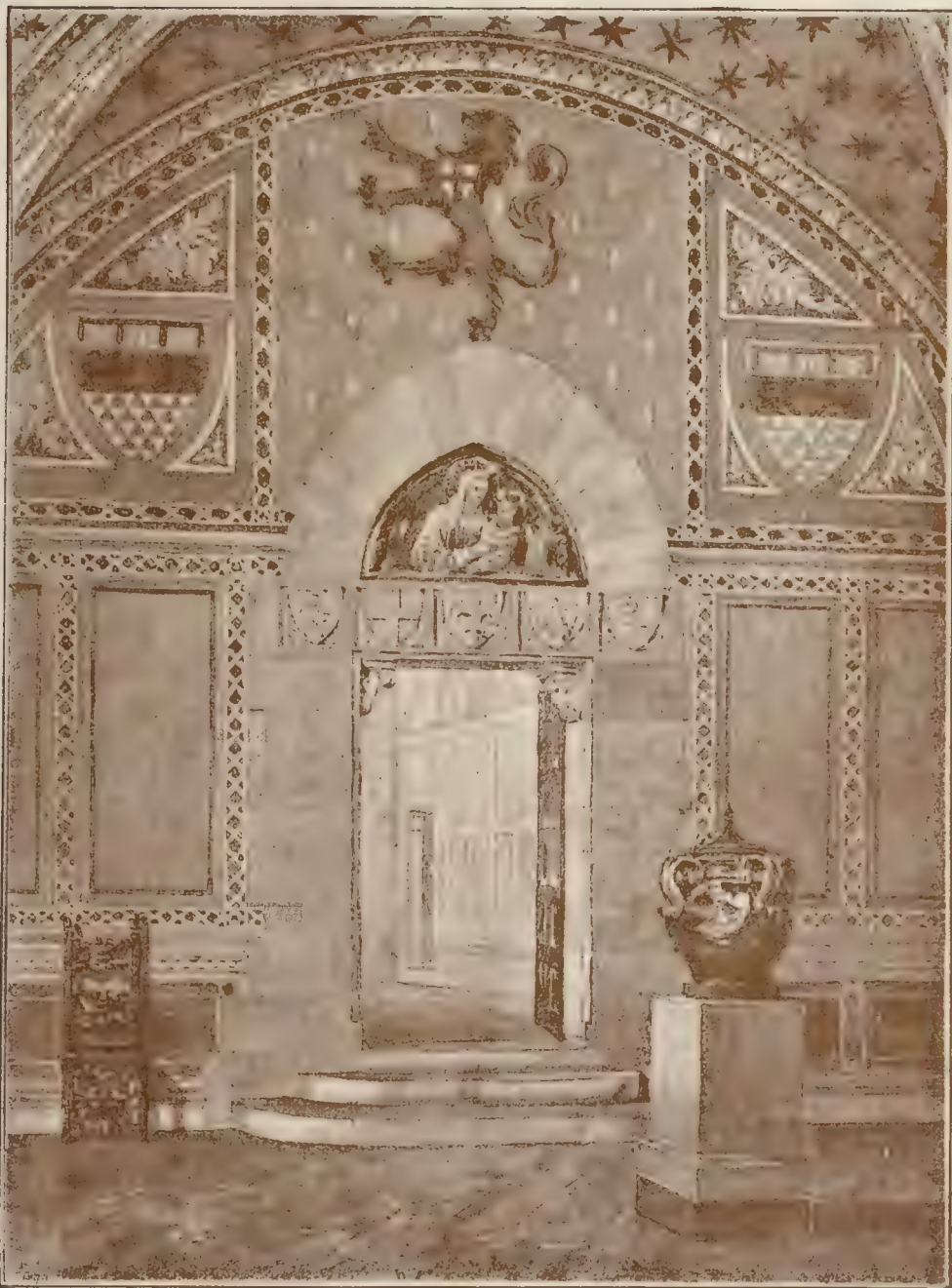


TOMB OF JUBA II.



TOMB OF JUBA II.; EXISTING REMAINS.—FROM A DRAWING BY MR. ALEXANDER GRAHAM, F.S.A.

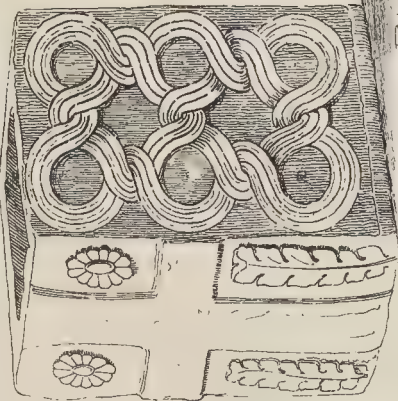




ENTRANCE TO THE CHAPEL, BARGELLO, FLORENCE.—FROM A DRAWING BY MR. H. W. LONSDALE.







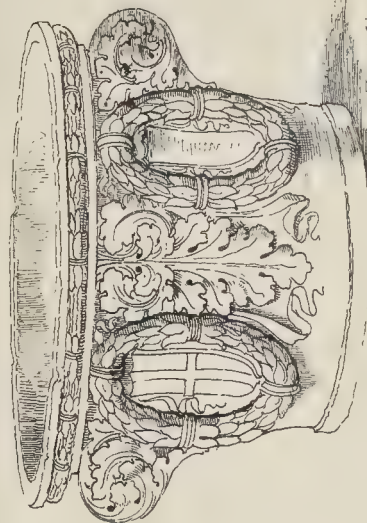
OLD WELL IN THE MUSEUM. VENICE.



CAMPO. S. S. GIOVANNI E. PAOLO.  
VENICE. 1884.



OLD WELL IN THE MUSEUM. VENICE.

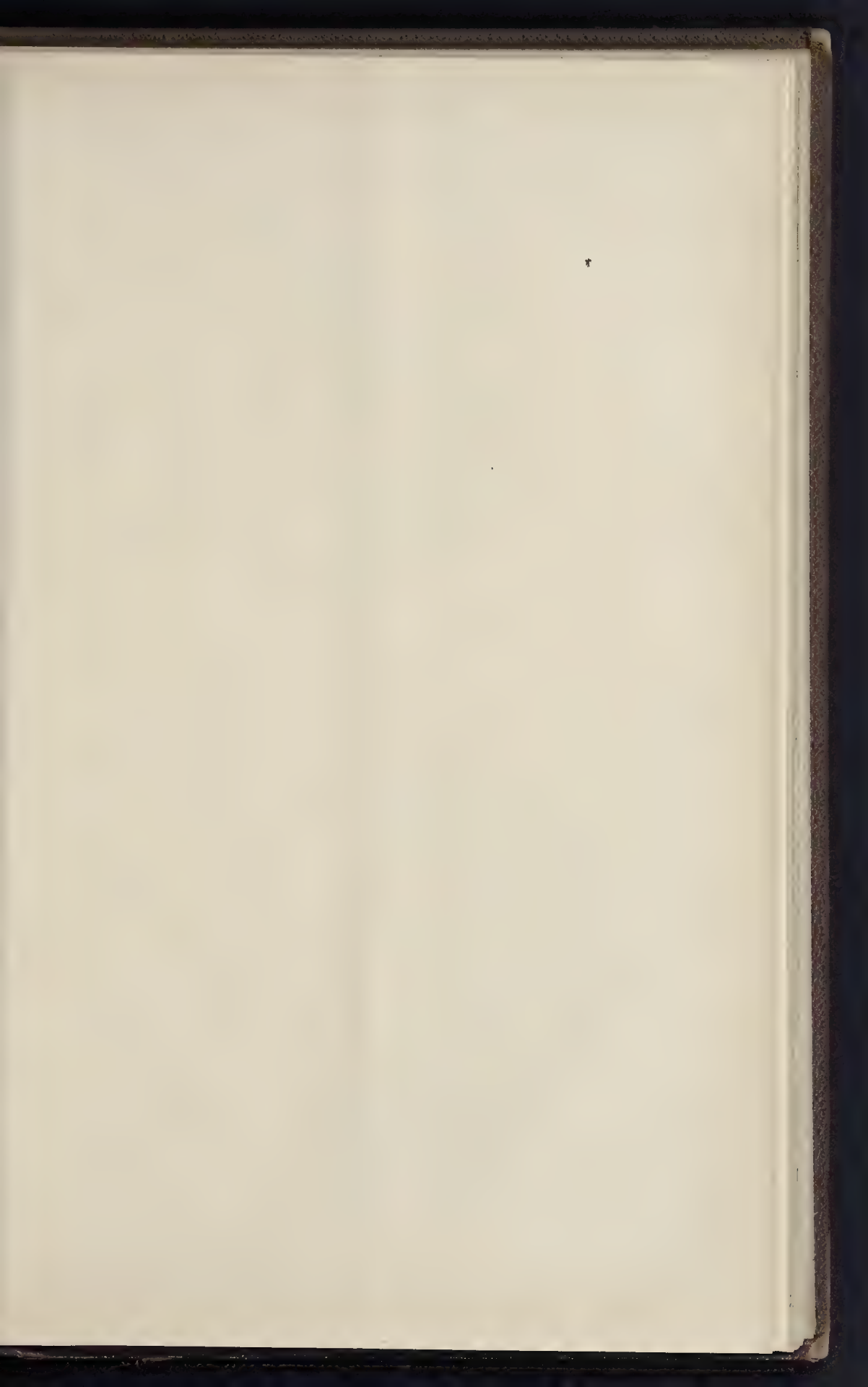


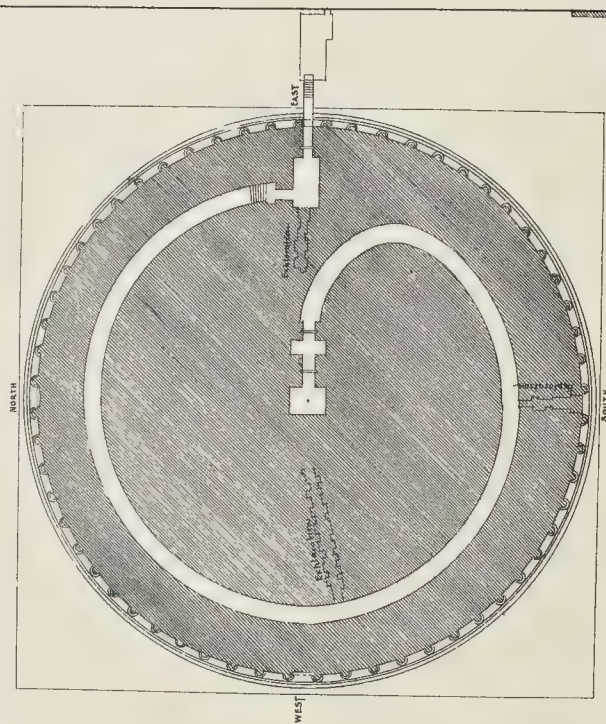
Richard Glazier  
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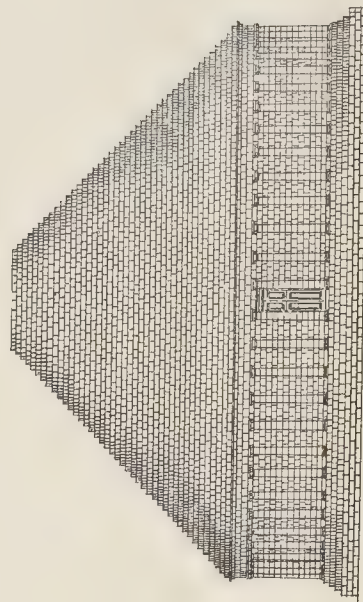








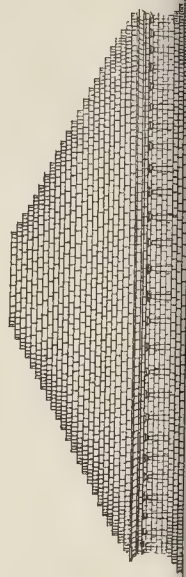
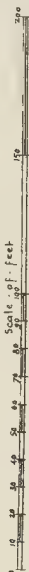
PLAN OF TOMB OF JUBA II



TOMB OF JUBA II

[RESTORED]

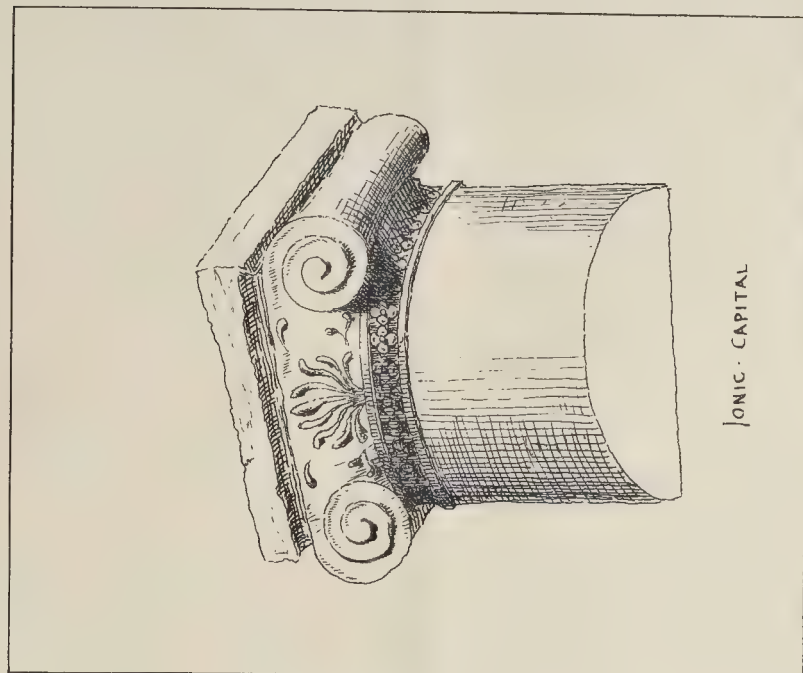
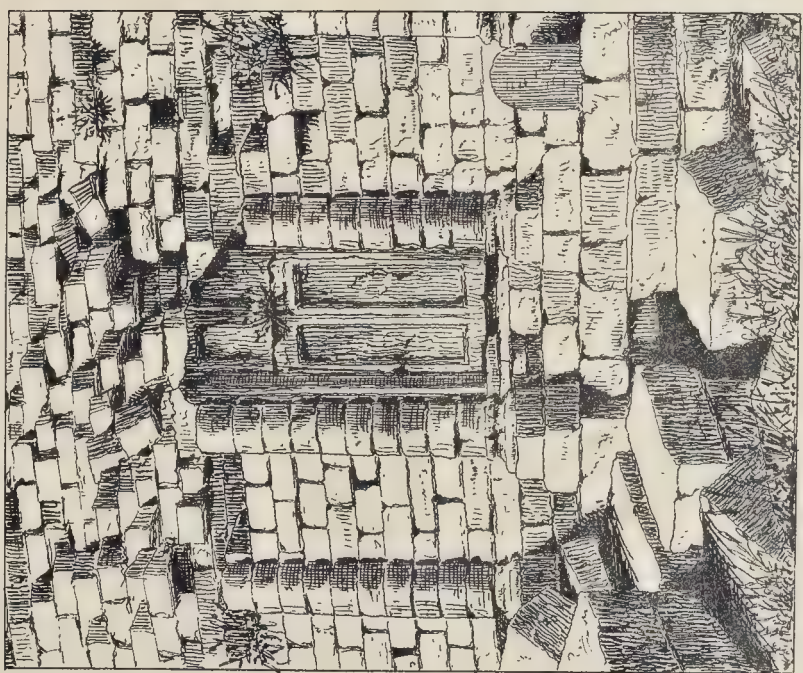
Scale of feet





1 2 3 4 5 6 7 8 9 10 11 12  
SCALE OF FEET

ENTRANCE TO TOMB OF JUBA II.



IONIC CAPITAL

PHOTOGRAPHED BY THE BRITISH MUSEUM, LONDON

TOMBS OF NUMIDIAN KINGS.—FROM DRAWINGS BY MR. ALEXANDER GRAHAM, F.S.A.





to revise the rules of the Association, and the rules which they had before them were the work of that special committee. The report, which had been drawn up, was to the President, Committee, and Members of the Architectural Association; therefore, they (the meeting) would be considering the report of a committee which they themselves had appointed.

Mr. Hugh Stannus said he had been asked by the President to begin the business that evening. He had been asked, and he did it with a very great deal of pleasure, to take the initial step in asking the Association to agree to the revised rules. The report commenced by saying that it was the report of the Special Committee for the revision of the rules, and was to the President, Members, and Committee of the Architectural Association. He had taken exception to that, because the Special Committee was appointed by the Association and not by the President and Committee, and the report should have been to the Association only. The rules had been divided into two classes, for it had been thought better that one portion should relate to the Constitution of the Association, and the other portion should be the By-laws. It was easy to divide the former rules into those two classes, and it was very generally felt that it ought to be more difficult to alter the Constitution than the By-laws. A constitution was something which had reference to the existence of a body, whereas By-laws referred to its continuance within itself. The very existence of a body should not be imperilled lightly by the voting obtained in a snatch manner at any meeting; whereas with By-laws it ought to be possible to alter them from time to time. Therefore, the object of dividing the rules into Constitution and By-laws would be understood. The Constitution had been placed first, and the first rule, the adoption of which he moved, was as follows:—

"1. The Society shall be called 'The Architectural Association'; and shall be carried on under the authority and provisions (so far as applicable) of the Literary and Scientific Institution Act, 1854."

Mr. H. W. Pratt seconded the motion, and the rule was adopted.

Mr. Stannus then moved the adoption of the second rule:—

"2. The objects of the Association shall be:—to afford facilities for the study of Architecture, and to serve as a medium of friendly communication between the members and others interested in the progress of the Art."

Mr. F. T. Baggallay seconded the motion. Mr. C. H. Brodie said that in the old rules one of the objects of the Association was stated to be "to advance the profession," and he would like to know why that had been omitted in the new rule.

The Chairman said it was obvious that their efforts were "to advance the profession," but their first object was to advance the younger members of the profession.

The Chairman then put the motion, which was carried.

Mr. Stannus then moved the adoption of the third rule, as follows:—

"3. The Association shall consist of Ordinary Members and Allied Societies."

Mr. Owen Fleming said that in the resolutions which had been referred to the Special Committee, ordinary members were divided into two classes: Town Members and Country Members. He should like to know the reason of the omission of that distinction in the rule as now submitted.

Mr. Cole A. Adams stated that the proposal under the new rules was to make the subscription the same to Town as to Country Members; therefore there would be no need to define any difference between Town and Country Members.

Mr. Fleming said he quite saw the reason, but he would like to defer the consideration of that part of the constitution until they came to the question of the subscription. He therefore moved as an amendment that Rule III. be deferred until the consideration of By-Law IX.

The amendment was seconded and carried. Mr. Stannus next moved the following Rule:—

"4. Members shall be engaged professionally in the study or practice of architecture; but, with the sanction of the Committee, gentlemen interested in the arts or sciences associated therewith may also become Members."

This having been seconded, Mr. Cresswell moved, as an amendment, that the word "ordinary" be inserted before the word "members" in the first line of the rule.

Ordinary members had been referred to in the previous rule, and the same should be done in Rule IV. or the adjective omitted in both cases.

Mr. W. Burrell seconded the amendment, which, on being put, was lost.

Mr. Burrell then moved that, after the word "be" in the first line, the words "generally those" be inserted.

This amendment not finding a seconder fell to the ground, and the original motion was then put and carried.

In regard to Rule V., Mr. Stannus said that as it stood it read thus:—

"5. Each ordinary member shall have the right to participate in all the privileges of the Association, and to vote as prescribed by By-laws."

He wished to add after the words, "prescribed by the By-laws," the sentence: "and the annual subscription from each present member shall be half-a-guinea."

Mr. Cole A. Adams said he heard the suggestion with the utmost amazement. Mr. Stannus, who sat on the Committee and had helped to thrash out the rules, had come and suggested an important alteration. He (Mr. Adams) hoped they would unanimously vote against it.

Mr. Stannus, in formally moving his amendment, said that in one of the By-laws it was stated that members elected prior to January 1, 1891, should pay an annual subscription of half-a-guinea. All he proposed to do was to transfer those words. Instead of appearing in a By-law, they should appear in the Constitution. The thing was perfectly clear, and he hoped his amendment would be carried unanimously, for it was only in that manner that the Association could vindicate its title to something like Consistency.

Mr. W. H. A. Berry said he fully shared Mr. Stannus's views on the point raised, but he thought the matter might be dealt with in another clause of the Constitution.

Mr. Stannus said he was willing to accept Mr. Berry's suggestion and move his amendment later on.

Rule V., as previously set out, was then, on the motion of Mr. Cole A. Adams, seconded by Mr. Goldsmith, carried unanimously.

Mr. Stannus then moved the adoption of Rule VI.:—

"6. Allied Societies shall be societies whose meetings are held not less than thirty miles from Charing Cross, and whose rules have been approved by the Committee of the Association."

Mr. E. W. Mountford seconded the motion.

M. H. O. Cresswell urged that allied societies should have a more definite distinction; such as that they should be engaged in the study of architecture. He suggested the insertion of the words "architectural or kindred" after the words "shall be."

Mr. Cole A. Adams said he thought the rule gave the Society every protection that was possible.

The amendment was carried, and Rule VI., as altered, was then put as a substantive motion and carried.

Mr. Stannus next moved the adoption of Rule VII.:—

"7. Allied Societies and their members shall have such privileges as prescribed by By-laws."

Mr. Needham Wilson seconded the motion, which was agreed to.

The adoption of Rule VIII. was next moved by Mr. Stannus:—

"8. The affairs of the Association shall be managed by a Committee, subject to the approval of the general body of Members."

Mr. E. W. Mountford seconded the motion, which was also agreed to.

Mr. Stannus then moved the adoption of Rule IX.:—

"9. The Committee shall consist of a President, two Vice-Presidents, two Secretaries, a Treasurer, a Librarian, and such number of ordinary members, and such representatives of allied societies as shall be prescribed by By-laws."

Mr. Slater seconded.

Mr. E. W. Wimperis moved, as an amendment, that after the words "shall consist of" in the rule, the words "the following honorary officers" should be inserted. This was carried, as was another amendment to omit the word "and" after the word "librarian." Rule IX., as amended, was then put as a substantive motion, and carried.

Mr. Stannus then moved the adoption of Rule X.:—

"10. All Members of the Committee shall be Members of the Association, and shall be elected annually as prescribed by By-laws."

Mr. Max Clarke moved as an addition to Rule X. the words, "And shall not be entitled to receive any monetary consideration or honorarium from the Association during their term of office or the session following."

Mr. Stannus said he hoped Mr. Clarke would not press his amendment, as it opened up a very delicate question. They did, he believed, ask their honorary secretaries to accept some small honorarium towards their expenses in connexion with the Association, but it was for money out of pocket. If they passed an amendment of that kind it might appear that it was aimed at the secretaries.

Mr. Goldsmith seconded the amendment, which, on being put, was lost.

After some further discussion Rule X. as set out was agreed to.

Mr. Stannus then moved the adoption of Rule XI.:—

"11. General meetings of the Association, including such as may be summoned by the Committee, on the requisition of Members or otherwise, shall be held, as By-laws may from time to time prescribe, and at least one general meeting shall be held in every year."

This was carried.

Mr. Stannus then moved as an addition to the Constitution, the following rule:—

"That the constitution of the Association shall be only altered or amended by a vote taken by means of voting papers sent to all Members as prescribed by By-laws."

Mr. Dicksee seconded the motion.

Mr. R. Phené Spiers said that he would like Mr. Stannus to amend his motion, so that in any alteration which might be made in the Constitution, it would be necessary to have two-thirds of the members present to make the alteration.

Mr. Cole A. Adams said he had no personal objection to voting by voting-papers, but it was a good old English way to vote by acclamation and with the hands.

Mr. Needham Wilson said that unless some such rule as Mr. Stannus had suggested were added to the Constitution, it would be perfectly competent for a small faction to dominate the whole of the Association by getting up a packed meeting. He did not think that country members should be debarred from having a voice in the affairs of the Association.

Mr. A. B. Pite supported Mr. Spiers' suggestion.

Mr. Spiers moved the following as an amendment:—

"That the Constitution shall be only altered by a vote of two-thirds of those present at a special general meeting called for that purpose."

Mr. T. E. Pryce seconded.

The amendment having been lost, Mr. Stannus's motion was put and carried.

On the motion of Mr. Owen Fleming, and seconded by Mr. Dicksee, the meeting was adjourned until Friday, the 19th inst., at 7 p.m.

#### ARCHITECTURAL SOCIETIES.

MANCHESTER ARCHITECTURAL ASSOCIATION.—On Tuesday evening last at the ordinary meeting of the Association, Mr. T. Chadwick, A.R.I.B.A., President, in the chair, a lecture was given by Mr. Edward Hewitt, A.R.I.B.A., Vice-president, and member of the firm of Messrs. E. & F. Hewitt, architects, Manchester, in the Lecture-hall, Athenæum, the subject being "A Tour in Normandy and Brittany from an Architectural Point of View," illustrated by oxy-hydrogen lantern, with sixty original views from drawings and photographs. A long report of the lecture came to hand too late for insertion this week.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—Mr. J. B. Mitchell-Withers, F.R.I.B.A., read a paper before the last meeting of this society on "The Development of Ornament in English Medieval Architecture." There was a good attendance of members and others, including Mr. F. Fowler, President; Mr. C. J. Innocent, Vice-President; Messrs. E. M. Gibbs, Potts, Winder, jun., Smith, Hemsell, H. Webster, Benton, McDougall, Wigfull, H. Tootley, A.R.I.B.A., J. T. Cook, and others. Mr. Mitchell-Withers introduced the subject by stating that a knowledge of the historical development of the various styles was absolutely necessary to the artist, and he proceeded to carry out that view by tracing the history of ornamental English architecture. He cited the principal characteristics of the English styles, adopting the simple nomenclature of Rickman, and divided the periods into Norman, Early English, Decorated, and Perpendicular. He instanced the principal English buildings in which these types are exemplified, and there



were lantern-slide illustrations (prepared principally by Mr. Mitchell-Withers, jun.) showing specimens of ornament in detail, and groups of each period found in various notable buildings. An interesting discussion took place, in the course of which Mr. Tooley, remarking on the lecturer's criticisms of the flint panelling work seen in Norfolk and Suffolk, thought the lecturer judged it too harshly. He admitted that its appearance was much improved by the hand of time. On the proposition of Mr. F. Fowler, seconded by Mr. McDougall, and supported by Mr. Gibbs, a hearty vote of thanks was awarded to the lecturer for his paper. Mr. Gibbs, in supporting the resolution, said he could not allow the opportunity to pass without asking the society to join him in congratulating Mr. J. B. Mitchell-Withers, jun., on having passed the recent examination to qualify for the Associateship of the Royal Institute of British Architects. He trusted that his example, as the first of the rising generation of Sheffield architects, would be largely followed by other of their junior members.

**BIRMINGHAM ARCHITECTURAL ASSOCIATION.**—At a meeting of this society held on the 9th inst., the president, Mr. T. Naden, gave an address to the members, in which he referred at considerable length to the growth and development of the city up to the earlier part of the nineteenth century, showing that its progress was the outcome of the wonderful power, energy, labour, and genius of the men who have created it. Beginning with the mention of Birmingham in "Domesday Book," and of the weekly market held in the twelfth century, Mr. Naden passed rapidly over the earlier periods of the growth of Birmingham till the stirring times of the seventeenth century, in which the old "Ship Inn," and Stratford House at Camp Hill were well-known houses on the outskirts of the town. Aston Hall was built by Sir Thomas Holt, and St. Martin's Church was raised in brick for its preservation. At the close of the seventeenth century, in 1689, the first dissenting chapel was built in Old Meeting-street, followed by a second in three years' time in Digbeth, and about the same time the Roman Catholics built a chapel and convent near the present St. Bartholomew's Church, both these were almost immediately destroyed, and in their place a chapel was built at Edgbaston. From this time onwards the growth of Birmingham was rapid and steady. Before the close of the seventeenth century there were six churches or chapels in the town, and, according to Hutton, "the greater prosperity of the people was reflected in the improved appearance of the town." St. Philip's Church was finished 1719, and in 1731 was, with St. Martin's and the newly-built Grammar School, the most prominent building in the town. North of which there lay the grounds of New Hall, and beyond those open country, while the centre of the town, from Digbeth to the Bull Ring, was occupied by picturesque gabled half-timber buildings overhanging the winding thoroughfare. Mr. Naden was able to show, by means of the surveys of Wesley and Bradford, and those of the present time, the growth in the next hundred years, and concluded his address by a tribute to the genius and labour of the manufacturers and inventors to whom Birmingham owes her prosperity. The hearty thanks of the meeting were, on the motion of Mr. H. R. Lloyd, supported by Messrs. Hale, W. Donleavy, W. H. Bidlake, and others, accorded to Mr. Naden, and with the vote was coupled a wish that the paper might be printed, in order that it could be permanently retained by the members of the Association.

**EDINBURGH ARCHITECTURAL ASSOCIATION.**—The second meeting of this Association for the present session was held on the 11th inst., Mr. John Kinross, president. Councillor Mackenzie read a paper on "Heating of Buildings by Hot Water and Steam," his opinion being that there was no advantage in using steam for ordinary buildings, while there were many disadvantages, and always considerable risk. The merits of various shapes of boilers were discussed, and the subject of mechanical ventilation, combined with heating, was touched upon. The paper was illustrated by diagrams. A discussion followed. The prizes gained by the successful students for the last year were afterwards distributed.

**Bronze Statuettes.**—Mr. A. L. Collie, of Old Bond-street, has reproduced in bronze, small size, Sir F. Leighton's "Sluggard" and Mr. Onslow Ford's "Peace."

#### THE LONDON COUNTY COUNCIL.

THE last ordinary weekly meeting of the London County Council prior to the Christmas recess was held on Tuesday afternoon last, Sir John Lubbock, Chairman, presiding.

*The Employment of Quantity Surveyors.*—The General Purposes Committee's report contained the following paragraph and recommendations:—

"On October 14 the Council resolved that a quantity surveyor should be employed by the Council (whenever required) to prepare bills of quantities for all large works, the Council accepting the responsibility for such bills of quantities; and on October 21 we reported that we proposed to make inquiries among persons in the profession, and to make a selection from a certain number of experienced surveyors. Having taken the course proposed, we have received a number of offers from persons carrying on the business of quantity surveyors in London, stating the terms upon which they would undertake the Council's work. All these offers we have carefully considered, with the aid of a sub-committee appointed for the purpose. We do not think it desirable that the Council should bind itself to only one quantity surveyor, or one firm of surveyors. It seems to us better to make arrangements with several firms, and in the case of each work to select the one which may appear best suited for the purpose. We recommend—

(a) That the following surveyors be retained as quantity surveyors, to prepare the bills of quantities in connexion with works to be carried out under the direction of the Chief Engineer of the Council: Messrs. Fowler and Huggan, 9, Craig's-court, S.W.; Mr. J. Nichols, 8, Craig's-court, S.W.; Messrs. J. H. Stradwick & Son, 10 and 11, Bedford-street, W.C.; Messrs. S. J. Thacker & Son, 25, Montague-street, Russell-square, W.C.

(b) That the following surveyors be retained as quantity surveyors, to prepare bills of quantities in connexion with works to be carried out under the direction of the Architect of the Council: Messrs. Franklin & Andrews, 25, Ludgate-hill, E.C.; Mr. C. W. Brooks, 64, Finsbury-pavement, E.C.; Messrs. A. H. Bardcastle, 34, Southampton-street, W.C.; Messrs. Young & Brown, 5, Henrietta-street, W.C.

(c) That the conditions of the arrangement with the persons or firms above mentioned be embodied in formal agreements to be prepared by the Solicitor, and that for that purpose the Chief Engineer and the Architect be instructed to furnish the Solicitor with such information as he may require."

These recommendations were agreed to without discussion.

*Rosebery Avenue.*—The Improvements Committee presented the following report as to this new thoroughfare:—

"The Council on July 15 last approved a contract for the supply of plane-trees for Rosebery-avenue, and, in conformity therewith, those needed for the completed section will be planted forthwith. It is necessary that they should be protected by guards, and we have therefore obtained designs and tenders for the same. We have selected a strong but neat pattern (for the whole thoroughfare we shall need 81), and we recommend—

"That the design of Messrs. Bayliss, Jones, & Bayliss be approved, and that, subject to an estimate being submitted to the Council by the Finance Committee, the required by the statute, the requisite number of tree-guards be obtained from that firm at £1. 3s. 9d. each."

By the terms of the contract for the construction of the viaduct at Rosebery-avenue (the Metropolitan Board of Works form having been used), it is stipulated that the contractor shall maintain the viaduct for twelve months after completion. For this purpose it has been usual to provide the contractor with some accommodation for tools and materials needed from time to time for such work of maintenance. The contractor for the viaduct claims under this form of contract to retain possession of some land between Warner-street and Cold-bath-square for the purpose indicated above. The Corporate Property Committee has arranged to sell the surplus land in this locality, and it is most desirable that the sites retained by the contractor should be given up. We have therefore called upon the contractor to do so, but he refuses unless he be relieved from any further maintenance of the viaduct. The Engineer has, after a thorough examination, reported that the viaduct and paving works are in a satisfactory condition, and that the contractor may be released from further responsibility, without any risk to the Council. We therefore recommend—

"That the contractor (Mr. Dickson) be called upon to remove all his plant from, and to give up possession of the vacant land adjoining Rosebery-avenue, at present occupied by him, and that thereupon he be paid the balance of his account and be relieved of all responsibility in respect of maintenance of the works."

These recommendations were agreed to.

After transacting other business the Council adjourned until Tuesday, January 13.

#### Books.

*Blackie's Modern Cyclopædia of Universal Information.* Edited by CHARLES ANNANDALE, LL.D. Vol. VIII. Blackie & Son; London, Glasgow, Edinburgh, and Dublin. 1890.

THIS forms the concluding volume of this excellent little Cyclopædia, and we must congratulate the publishers and the editor on the punctual manner in which the successive volumes have been issued, a merit which is unfortunately very rare in the case of works of this kind brought out in a series of succeeding parts. Among the subjects in the eighth volume there are not many that come within our scope, but "Theodolites" and "Theatre" are both fairly treated according to the limits imposed by the scale of the dictionary, the latter article including some general information on the Greek theatre, with a small engraving of the theatre of Segesta restored.

Speaking generally, Dr. Annandale has done his work admirably, and the Cyclopædia is a very useful one in a small compass. The maps are a most useful addition, and the indications of pronunciation of words are given on a clear and intelligible system. We have never opened the book for information on any subject on which a work on that scale should give information, without finding it; and we have found information sometimes which is wanting in larger and more ambitious works.

*Surveying and Levelling Instruments.* By W.F. STANLEY. London: E. & F.N. Spon. 1890.

FEW can write with such experience on the construction of surveying and levelling instruments as Mr. Stanley. The book now published by him, which is intended to be the complement to a former work, by the same author, on drawing-instruments, six editions of which have been called for, describes both theoretically and practically all the instruments that are generally used by civil engineers and surveyors, from a 2-ft. rule to a 36-in. theodolite; and a typical example of each class is examined in detail, frequent reference being made to the many excellent illustrations, in order to make the subject as clear as possible.

To render the work quite complete it was thought necessary to give briefly the manner of using many instruments in practical surveying, as well as explaining those optical principles upon which many of the instruments depend; consequently, the book will be found of value in this respect to those who are in the habit of using the instruments described by the author.

*Quantity Surveyors' Tables and Diary.* Revised and re-written by a Fellow of the Surveyors' Institution. London: Metchin & Son. 1891.

THIS is a small diary of a convenient size and shape, containing a number of pages of facts for reference; extracts from the Metropolitan Building Act, data as to materials and measurements &c. It seems to be well done as far as the contents go; the copy sent to us has only a paper cover, which would soon be worn out in the pocket; possibly it is also published in a more durable cover.

#### German Architectural Publications.

AMONG the long list of German architectural publications which have been brought out in the course of the year we find several interesting ones in the form of sets of photo-lithographs, partly of subjects already well known through measured drawings.

Among the former sets we must count two publications by Professor H. Strack, of Berlin, whose carefully-compiled volumes of December, 1889, on "Italian Brick Buildings" (Gothic and Renaissance periods), comprising fifty excellently reproduced plates, together with a number of illustrations in the text, has been much commended by archaeologists, architects, and art-critics abroad. These two publications are:—(1) "Baudenkmaeler Roms des XV.-XIX. Jahrhunderts," as an extension to Letarouilly's "Édifices de Rome Moderne," and (2) "Baudenkmaeler des alten Rom," both consisting of a series of very fine views reproduced from photographs, and showing both detail and general effect very clearly.

Among illustrative works on subjects not so well known as the former is the set compiled by



M. Junghündel, "Die Banknet Spaniens," embracing the more important Spanish monuments of the Moorish, Romanesque, Gothic, and Renaissance periods, and forming a six-volume publication, with 150 folio illustrations. Another such publication on the monuments of Portugal is also in course of preparation, and promises to be quite up to the average standard.

Of the photo-lithographic sets, treating of quite modern work, H. Rueckwardt's "Berliner Neubauteil" (vol. 1, 20 sheets folio) ought to be mentioned, the choice of subjects having been carefully made, whilst the reproduction has been done in a first-class style; and another set, published in Vienna under the title, "Moderne Wiener Barockfacaden" (30 sheets folio), might as well be here referred to as a very similar work.

*The Post Office London Directory, 1891.*  
London: Kelly & Co., Great Queen-street, W.C.

THIS is, it appears from the title-page, the ninety-second annual issue of a truly indispensable publication. The present edition testifies more than ever (if further testimony were needed) to the unflagging enterprise and unceasing energy of the publishers. The book has again slightly increased in size, this year's issue consisting of 2,849 pages as against 2,706 pages in the issue for 1890. But the principal event connected with the present edition is the reduction in the price from 32s. 6d. to 25s. to subscribers, and from 40s. to 32s. to non-subscribers. This material reduction in price should, and no doubt will, lead to an increased demand for the Directory, the usefulness of which is commensurate with its bulkiness. Another proof of the enterprise of the publishers is given by the issue with the Directory of an entirely new map of London on a somewhat larger scale than that used in recent years, viz., 4 in. to the mile instead of about 3 in. to the mile. The result of this is that the new map is very much clearer to read than the old ones; but *per contra*, it must be pointed out that inasmuch as the size of the map as a whole is very little larger than that of last year's issue, it does not take in so much of the suburban districts as the old map did. To have made the new map on the enlarged scale cover as much ground as the old map would, however, have been attended with the disadvantage of making it somewhat unwieldy in size; while the disadvantage (if such it be) of excluding some portions of the suburbs is more than compensated for, in our opinion, by the enlargement of the scale of the map, which, as it is, extends from Shepherd's Bush and Hammersmith in the west, to Stratford and Blackwall in the east, and from Highgate and Holloway in the north, to Brixton and Camberwell in the south,—that is to say, the map covers an area of about ten miles long by nearly seven miles broad. This will be found sufficient for all practical purposes of business, especially when it is remembered that for the suburban districts Messrs. Kelly & Co. publish a separate directory. On the whole, the change in the map is very decidedly for the better. There are one or two errors in it, however. For instance, the piece of ground officially known as Myatt's Fields, Camberwell, presented two years ago to London by Mr. Minett, a builder, is figured on the map as "Camberwell Park." But "Camberwell Park" is the name which was given many years ago to, and which is still retained (*malgré* the new map) by the much smaller piece of ground formerly known as Camberwell Green, at the foot of Denmark-hill. Again, the way in which "Marshalsea-road" (the new street from Southwark Bridge-road to the Borough, opposite Great Dover-street) is shown is not quite accurate. As to the Directory itself, every effort appears to have been made to post it close up to date. For example, the case of Mr. Wm. Beckett, late M.P. for the Basselaw Division of Nottinghamshire, whose lamentable death on the South-Western Railway was mentioned in the papers for November 25, has been struck out of "Parliamentary" pp. 2,515 and 2,528, "Court," p. 2,289, and "Banking," p. 2,753. Again, the name of Sir Edward E. Kay, Lord Justice of Appeal, sworn of the Privy Council, gazetted November 25, appears in the list of Privy Councillors, p. 73.

**CHRISTMAS WEEK.**—The *Builder* for next week will be published on *Wednesday morning*. All communications for the Editor must reach the office by *Tuesday morning*.

## Correspondence.

To the Editor of THE BUILDER.

### "DEATH TO IMPERFECT VENTILATORS."

SIR,—On page 465, Mr. J. Simmance asserts that he has never mentioned the use of his ventilator with valve in it for soil-pipe ventilation. Now, I beg to ask, then, who it is that is responsible for the issuing of the illustrated circular showing two valve ventilators, with the words above them:—"Sugg's New Patent Continuous Up-draught Ventilators, Sugg's & Simmance's Patents," and underneath the diagrams, "For ventilating Soil-pipes"?

This circular purports to be issued by "William Sugg & Co.," with which firm Mr. Simmance is connected, and I have every reason to believe that he is the "Simmance" mentioned in the circular.

Further, in the columns of various contemporary journals this valve ventilator has been illustrated, and at the same time it is stated that it may be applied "also for ventilating soil-pipes, one being put upon the soil-pipe at Messrs. Sugg's works in Regency-street, Westminster."

As to the assertion that exit valves may be used to advantage upon soil-pipes, that may be possible under certain circumstances, but in ordinary plumbing the use of either my balanced hinged-valve ventilator, or Mr. Simmance's form of such, or his disc valve one either, upon the top of the ventilating pipes of soil-pipes, is a mistake.

For Mr. Simmance to state that, with a "radical deviation" from ordinary plumbing practice, valve ventilators may be used, goes for nothing when no advantage from the change is pointed out.

Mr. Simmance asserts I never invented a closely-fitting valve like his. Now, his (?) balanced hinged-valve is similar to one of those illustrated in my patents of A.D. 1878 and 1883. The latter shows a small pipe for carrying off the water, and Mr. Simmance also has. Having given the dates of my patents, I now again ask Mr. Simmance to tell us the No. and date of his two patents. I have repeatedly asked this information both publicly and privately from both Mr. Simmance and Messrs. Sugg & Co., but have never got it. Neither can my patent agents discover evidence of the existence of such. Why is this, if proper patents really exist? The use of a hinged balanced valve inside an outlet ventilator is now public property, but in calm weather it is a great hindrance to the ventilation.

W. P. BUCHAN.

SIR,—I notice in your issue of to-day that Mr. J. F. Simmance denies that he ever advocated the use of valves in such a manner as to produce syphonage, or that he ever mentioned soil-pipe ventilation in connexion with any valve.

Might I draw Mr. Simmance's attention to the circular issued by Messrs. Wm. Sugg & Co., Limited, illustrating the particular ventilator, with valve arrangement referred to?

The last sentence used says, "for ventilating soil-pipes, drains, &c.," and among the advantages claimed for it is that "it is fitted with a new patent automatic float-valve."

I presume that as joint patentees with Mr. Sugg, Mr. Simmance must be held responsible for this circular, and his name is duly printed thereon.

I express no opinion on the correspondence, but where a simple matter of fact is concerned, I think this should not be allowed to pass unchallenged.

JAMES CHALMERS, I.A., Architect.

Glasgow, December 13.

### REMAINS OF ST. MARY'S ABBEY, ISLE OF WIGHT.

SIR,—With the owner's permission I have started excavating the site of the Cistercian Abbey of St. Mary, at Quarr, in the Isle of Wight, on the lines laid down after a careful consideration of the "lay of the ground," and have, so far as I have gone, met with complete success. The ground has not, I believe, been broken since the reign of James I., when Sir John Oglander essayed a haphazard excavation with complete failure of result. The abbey was bought soon after the "Dissolution" by a Southampton merchant named Mills, who, in the most vandalic manner, pulled down this monument of religious piety, and sold the fragments for building material. Although the stones have, in many cases, been entirely removed, we have come upon, at an average depth of 4 ft., the concrete bed on which they lay. The foundations at present discovered appear to be those of the great church, the chapter-house, the cellarium, the frater, the dormitory, the kitchen, the calefactorium, and the infirmary. The cloister apparently was of considerable size, 130 ft. by 120 ft.; and a lady chapel will, I expect, be found to the east of the great church. The enclosing walls of the monastery comprised an area of nearly forty acres, and are, more or less, still in situ. The ground, unfortunately, has for many years been used for farm purposes, which makes exploration a somewhat difficult matter.

So far the cost of excavating has been defrayed out of my own pocket, but, finding so much as we have done, it becomes an imperative necessity to

progress further, which intention I shall be compelled to abandon unless I can succeed in securing outside help, as the cost will be too great, I fear, for a "private purse." I sincerely trust that those interested in the history of the past will not allow a work of so important an archaeological nature to fall to the ground for want of funds.

PERCY G. STONE,  
To whom all communications can be addressed,  
16, Great Marlborough-street, W.

### ALTAR-TABLES.

SIR,—In Nerquis church, Flintshire, is an altar-table of the character mentioned by your correspondent, "T. R. S." [p. 465, ante]. The two legs at one end, intended to be placed towards the congregation, are square in section, with richly-carved patterns on the flat surfaces, the ground of the panels being sunk. The top and bottom rails are carved in the same manner. Below the top rail, at this, the "show" end, is a second, thinner, deep rail, cut to a semi-circular, arched form, with surface-carving following the arch, with further carving in the spandrels between this and the top rail. The opposite end of the table has legs square and plain at the top and bottom, the middle part being turned and fluted. The top rails at this end and at the sides are carved, with small, plain brackets beneath, next the legs.

As the table now stands, altar-wise, the front shows legs of different pattern at the opposite ends. The work dates from the early part of the seventeenth century.

C. R. B. K.

## The Student's Column.

### HOT-WATER SUPPLY FOR BATHS, LAVATORIES, &c.—XXV.

LOW-PRESSURE BOILERS, ALSO FITTING HIGH-PRESSURE BOILERS FOR TEMPORARY LOW-PRESSURE WORK.

**B**OILERS that have to supply water upon or below their own level only are commonly designated "low-pressure" boilers in contradistinction to those that are called high-pressure and have to supply water to the floors above. These boilers partake of infinite variety in shape, and they are constructed of a great variety of materials, as not only can we have them of welded wrought-iron and copper, but also in cast-iron, and galvanised wrought-sheet.

Cooking-ranges that have but one oven are usually fitted with a boiler at the opposite side of the fire, this boiler being generally of cast-iron, having an open top with a loose cover, and being of the shape and size that the manufacturer considers most suitable for the purpose to which it is adapted. Of all materials *common* cast-iron is the most unreliable, as nearly everyone knows, owing to its liability to crack if suddenly or unequally cooled at any time; the next best material is galvanised sheet-iron, but this has a disadvantage in its being apt to laminate, that is, peel or flake, from which it soon perishes, and, although it is not likely to crack, its failure will occur almost as soon as the former material, although it will not be so sudden. A more reliable material is a good quality of soft cast-iron, this material making excellent boilers; and range-makers who use this metal have but a small demand for new boilers, as only the greatest neglect will bring about a fracture. Next in lasting properties is welded wrought-iron; this is given to lamination, although not to the extent of sheet iron, and, even if it were, its life would still be a long one, as they cannot very well be made of a less thickness of plate than  $\frac{1}{2}$  in. Last and highest in the scale of excellence is copper; this is necessarily costly, but gives the best results, although if made of very thin sheet it will not do much better than some of the others. The materials that permit of general use, and which are generally satisfactory, may be said to be the good quality cast and the welded wrought-irons.

When any of these boilers require renewing, a most difficult task commonly presents itself, as no means are provided for removal and replacement without dismantling the range, occasioning sometimes eight to twelve hours' work more than there need be, and the cost is, of course, proportionately increased, both in labour and material, whereas the work charge should never exceed a matter of shillings, if suitable provision is made. Every range-maker knows that new boilers are needed sometimes, and it is the most simple thing imaginable to make the provision, as, instead of having the



boiler screwed on to the hot-plate itself, there should be a loose panel to which the boiler can be attached, so that by removing the tap (and the union, if it is connected to a self-filling apparatus) the boiler can be lifted right out, as fig. 66.

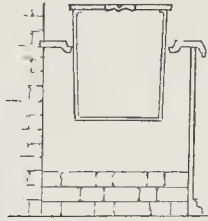


FIG. 66.

The best method of preserving the life of these boilers is to have a self-filling apparatus fitted up and attached to them, so that their being supplied with water is not dependent upon the attention of servants, for, even with the most careful, forgetfulness must sometimes occur; and, if not forgotten, the boiler is not always kept *quite* full, which leaves the part which experiences the greatest heat, viz., one side at the top, without any water behind to protect it.

In fitting up a self-filling apparatus, or when connecting an existing apparatus to a new range, there is a most serious error commonly perpetrated in not allowing the boiler to fill sufficiently; it is quite the usual practice for workmen to regulate the ball-valve so that the boiler fills up within about 3 to 4 in. of the top, and this leaves totally unprotected the upper portion of the boiler where the flame and heat impinges with the greatest intensity, and the result is that a new boiler is needed much too soon. The average workman's argument in favour of this is that "room must be left for boiling," and further that the steam which rises from the water when it boils will serve to protect the metal the same as water. Both these arguments are quite wrong, as in the first place the difference in bulk between very cold and very hot water is only about one in sixteen, so that  $\frac{1}{16}$  in. is sufficient room for expansion, but to allow for ebullition as well it is best to regulate the ball-valve so that the water fills up to from 1 in. to  $1\frac{1}{2}$  in. of the top (when cold), this will be ample, as the water in these boilers never boils very furiously. Steam will not protect the iron, as, while it is at a high temperature, it is a gas without appreciable moisture.

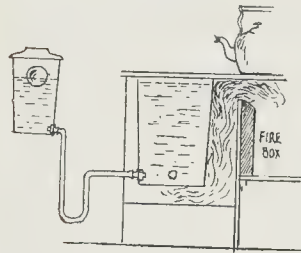


FIG. 67.

Fig. 67 shows (in sectional elevation) a boiler fitted with a self-filling apparatus in an ordinary approved manner, and the flame passing from the fire is also shown impinging directly upon the upper part of the boiler side, as just explained, and where it is so necessary that there should be water.

One of the most common complaints a range-maker has is of peculiar character: although an explanation will make it quite clear to any one, yet strange to say, only a small minority of our range-fitters know the simple means of remedying the trouble. The complaint in question is, that the "boiler won't heat," meaning, of course, that the water in the boiler does not get hot as it should do; now, this complaint may be correctly stated in some instances, but as it occurs

with the greatest frequency with quite new ranges, it is obvious that there is some special cause for it.

A more accurate description of the fault will be found in the majority of cases to be "that there is hot water in the boiler, but it will not flow out at the tap," and it is sometimes described in this way by the person who complains.

It will be noticed in the preceding illustration that the cold-supply service is connected into the side of the boiler near the bottom, and this is strictly correct, but it will be noticed that the tap is also at the bottom of the boiler, generally within a very short distance of where the cold water enters. The action that takes place when a tap is opened is that the contents of the boiler nearest the bottom commence to flow out, and at the same instant cold water commences to flow in; now, as the cold water is heavier than the hot that may be in the boiler, it will be found that a steady flow will set in from the cold-supply pipe to the tap across the bottom, hardly disturbing the heated water above, and unless remedied in the way about to be described there will be no means of getting the hot water out unless we stop the inflow of cold each time the tap is opened, or else ladle the water out at the top of the boiler.

There is, fortunately, a very simple means of remedying this, as all we have to bear in mind is (as already explained on two or three occasions), that the hot water, whether there be much or little, will be found at the top of the container. Therefore with all boilers that are self-filling, the tap should be inserted within three or four inches of the top, when the range is first made; or, with ranges already made, the difficulty can be overcome by attaching an elbow and short piece of pipe to the end of the tap, standing up *inside* the boiler, as shown at fig. 68. The elbow and pipe simply require to be screwed on tightly; these joints need not be perfectly water-tight, and it is the easiest remedy imaginable, except with  $\frac{1}{2}$  in. cocks, as

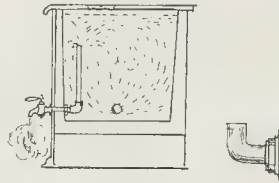


FIG. 68: FIG. 69

we cannot get iron elbows and pipe of this size. This tap needs an elbow specially made for the purpose, or a  $\frac{1}{2}$  in. one can be used by soldering it on to the back-nut of the cock, as fig. 69, or a piece of lead pipe, if properly secured, will answer.

The stand-pipe should terminate at top, about four inches below the water level, as we must allow for the water issuing from the tap in greater quantity than it comes from the ball-valve.

#### OBITUARY.

SIR EDGAR BOEHM, R.A.—We regret to announce that Sir Edgar Boehm died suddenly on the evening of the 12th inst., while working in his studio in the Fulham-road. Shortly before six o'clock he was found in a dying condition, and when medical assistance was obtained he was discovered to be dead. It is stated that Sir Edgar was seen about an hour earlier by one of the attendants at the studio, and he then appeared to be in his usual health. He was born in Vienna on July 6, 1834, of Hungarian parents, his father being Director of the Mint in the Austrian Empire. He was educated in Vienna, and from 1848 to 1851 in England. He also studied in Italy, and for three years in Paris, and in 1852 settled permanently in England. Here he speedily obtained work as a sculptor, and, having been fortunate enough to obtain the patronage of the Queen, soon had as many commissions as it was possible for him to execute. A complete list of his works would be a long one, but among them we may mention his statues of Thomas Carlyle and of William Tyndale (the first translator of the Bible into English), which are placed on the Thames Embankment. Sir Edgar also executed the equestrian figure of the Duke of Wellington, which has replaced at Hyde-park-corner the one by Wyatt, which was transferred to Aldershot. He became an Associate of the Royal Academy in 1878, and an Academician in 1882, and a baronetcy was conferred upon him in 1889. Sir Edgar married, in

1861, Louisa, only daughter of Mr. F. L. Boteler, who died a few months ago. His remains are to be interred in the crypt of St. Paul's Cathedral this Saturday, the 20th inst.

MR. P. HORSMAN.—The death is announced of Mr. Philip Horsman, which took place on the 14th inst., at Wolverhampton. According to the *Wolverhampton Chronicle*, Mr. Horsman went to Wolverhampton about the year 1854, and carried on business as a stone-mason. He secured a number of large contracts for building in and about Wolverhampton, and in time established a thriving business as a builder. He erected, at his own cost, and gave gratis to the town of Wolverhampton, the Art Gallery in Lichfield-street.

#### GENERAL BUILDING NEWS.

WHALTON PARISH CHURCH.—The chancel of this ancient and interesting parish church has been restored. The works include the provision of marble pavement and steps, carved oak rood-screen, choir-seats, and altar-rails. The east window has been raised 2 ft. higher in the wall, thus giving space for a dorsal with side hangings. A part of the old plaster has been removed from the south wall, laying bare the traces of an ancient low-side window, close to the east wall, and ancient sedilia which had been destroyed and walled up apparently in the fifteenth century, a piscina and confessional combined taking the place of the sedilia, with an almsy. In raising the modern east window, it was found that the inside arch was made of a large grave slab, with a floriated cross and sword incised upon it. This had been cut away to give it an arched form, and the incised cross covered with plaster. The marble pavement, of Crostley, Scillon, and Sileman mables, was supplied and laid by Messrs. Emley & Sons, of Newcastle. The oak work was made by Mr. Ralph Hedley, of Newcastle; the contractors for the alterations of floors and east window were Messrs. Carso & Sons, of Amble; and the whole of the work was carried out from the designs of Messrs. Hicks & Chawwood, architects, of Newcastle.

ORREXING NEW MARKET BUILDINGS AT BARRY.—On the 11th inst. new market buildings at Barry were formally opened by Mr. D. T. Alexander. The buildings have frontages to Barry Dock-road, West-street, and High-street. The premises just completed form part of a larger scheme which has for its object the erection of market buildings, 166 ft. in length by 74 ft. in width. The portion of the scheme now completed comprises a market-hall, 74 ft. in length by 40 ft. in width. Shops are arranged on both sides and at the front of the hall. The internal portions of the walling to the hall are faced with red brick, and are divided into bays on one side, with pilasters and arches over, with windows in the centre of each bay lighting the rooms over the shops. The light to the market is principally obtained from glass in the apex of the roof and clerestory windows. The ceiling has been boarded with match-boarding. The height is 33 ft. to the springing of the roof, and 48 ft. to the apex. The central hall has been arranged so as to be available for concerts, &c. The interior will be warmed with hot-water pipes by Mr. E. Hampton, of Abercromby. The style of architecture adopted has been "Queen Anne," freely treated with moulded cornices, string-courses, &c., the walling being faced with red brick relieved with Bath stone. The work has been carried out by Messrs. C. Shepherd & Son, of Cardiff, at a cost of 3,672*l.*, from designs by and under the superintendence of Messrs. W. G. Hibernson & Fawcett, of London.

NEW SCHOOLS, HEATON MOOR.—On the 13th inst., the new church schools of St. Paul's, Heaton Moor, were formally opened by Lady Egerton. The total estimated cost of the building is 2,000*l.* The schools, which have been erected by Messrs. Neill & Sons, according to the design of Messrs. Darbyshire & Smith, of Manchester, have a frontage to St. Paul's-road. The plan consists on the ground floor of two rooms 60 ft. by 22 ft. and 30 ft. by 24 ft., and having a class-room on either side 18 ft. by 16 ft. In the basement is provided a kitchen, and also heating apparatus chamber and coal cellar. The schoolrooms are heated by a series of hot-water piping, with valves to shut off various portions of the building as required. The walls are lined with enameled bricks to a height of 4 ft. The roof timbers where seen, and inside doors and finishings, are of pitch pine, and the entrance floors are tiled. Buff terra-cotta, manufactured by Mr. J. C. Edwards, of Rulon, has been used for the window jambs, heads, sills, and other dressings in lieu of stone. Buff bricks have been used for all external faces of the buildings. The roofs are covered with Westmoreland green slates from the Moss Riggs quarries. An open turret is fixed on the front roof to be used as a ventilating shaft and belfry.

PROPOSED NEW HOSPITAL FOR WALLSEND.—The erection of an infectious diseases hospital in the neighbourhood of Wallsend has for some time engaged the attention of the local authorities in that district. The *locality* of the proposed hospital is about half a mile from Wallsend, and distant some 300 yards from any habitation. The new building will be flanked on the west and south by a deep ravine, known on Tyne-side as the Burn Closes.



**NEW INDUSTRIAL SCHOOLS AT SHUSTOKE.**—The new industrial schools of the Birmingham Corporation at Shustoke have just been inspected by the Industrial Schools Committee. The new buildings have been approved by the Home Office, and erected from the plans of Mr. Daniel Arkell, architect, Birmingham, by Mr. W. Hopkins, builder, Birmingham. The new schools consist of an assembly hall, 35 ft. by 70 ft., with a recessed platform at one end. At each side of the platform are provided ante rooms, and a room above to be used as a library. The upper portion of the walls of the hall is faced with red pressed bricks, and a glazed brick dado in different colours. The floor is paved with wood blocks. The whole of the rooms are heated by means of hot-water pipes carried from the heating apparatus in the basement. The exterior of the building is treated in the Renaissance style of architecture. The roof is surmounted by a clock tower. The other extensions comprise a new swimming bath, lined with white glazed bricks, with the dressing-room adjoining. There are also a new dormitory for the officers, and a general room. The lavatory contains five basins on slate tops, supplied with hot and cold water. The walls of the interior are lined with white glazed bricks, and the floor is of Victoria concrete. The whole is lighted by a lantern roof, with provision for ventilation. A new playground is provided for the boys adjoining the schools. The new workshops are so arranged as to be in close proximity to the stores and gas works with the coal stores adjoining. The washhouse has been extended, and a new fire-proof staircase provided. A new glass-covered way is provided at the one side of the quadrangle so as to connect the laundry, washhouse, bakehouse, kitchen, &c., with the administrative department.

**CEMETERY CHAPEL, SOUTHOFF.**—Part of a new cemetery for Southoff, Lancashire, was on the 12th inst. consecrated by the Bishop of Manchester. A small mortuary chapel has been erected near the entrance at a cost of about 500*l.*, the whole works being carried out from designs by and under the superintendence of Mr. E. Howard Dawson, A.R.I.B.A., of Lancaster.

**ST. MARY'S PARISH, CHURCHILLS, MANCHESTER.**—is being provided with a commodious building, to be known as St. Mary's Hall, which is to be used as a Sunday School and for other parochial purposes. The cost of erection will be about 2,600*l.* The architect is Mr. Thomas Muirhead, of Manchester.

**PROPOSED WORKMEN'S DWELLINGS ON THE BIRMINGHAM SEWAGE-FARM.**—Major-General C. Phipps Carey, R.E., one of the Inspectors of the Local Government Board, recently held an inquiry at the Council House, Birmingham, into an application by the Birmingham Tame and Lea Drainage Board for the purpose of erecting twenty workmen's cottages on the sewage-farm, and providing the same with an efficient water supply. The Town Clerk explained that a large number of workmen were employed on the sewage-farm, and as there were few dwelling houses in the immediate neighbourhood, some of the workpeople had to walk as much as two miles to and from their work. To remedy this inconvenience the Board proposed to erect twenty cottages, in two blocks, at an average cost of 150*l.* per house, each to consist of three downstairs and three upstairs rooms, with ample modern sanitary arrangements. The well-water on the farm was bad, and it was proposed to connect the cottages with the water mains of the Birmingham Corporation, which passed near, at an estimated cost of 250*l.*—The City Surveyor produced plans of the proposed cottages, and gave particulars of the area, means of ventilation, &c.—The Inspector promised to use his influence in the direction requested.

**PROPOSED NEW BATHS AT STOCKTON.**—On the 10th inst. Colonel Charles Henry Luard, R.E., one of the Inspectors of the Local Government Board, held an inquiry at the Town-hall, Stockton, with reference to the application of the Corporation to borrow 6,500*l.* for the purpose of reconstructing the baths and washhouses, and 1,000*l.* for the purchase of property for improving the means of ingress and egress from the Borough Hall. The Borough Engineer submitted plans showing the alterations, and explained the same to the Inspector. No one appeared to oppose the application.

## SANITARY AND ENGINEERING NEWS.

**THE WATER SUPPLY OF LLANELLY.**—A public meeting was held at the Town-hall, Llanelli, on the 8th inst., for the purpose of supporting the Local Board in applying in the ensuing session of Parliament for powers to construct a storage and service reservoir (to cost about 60,000*l.*) in the Cwmllidi Valley. Mr. Joseph Maybery presided. In the evening remarks, the Chairman moved, "That this meeting approve of the Local Board proposing a Bill in the ensuing session for the construction of a storage and service reservoir at Cwmllidi." A vote was taken, and the motion was unanimously carried.

**SEWERAGE AND SEWAGE DISPOSAL: KNARESBOROUGH (YORKSHIRE).**—At a special meeting of the Knareborough and Tentergate Improvement

Commissioners and Local Board of Health, held a few days since in the Town-hall, Knareborough, Mr. B. T. Wood, J.P. (chairman), presiding, Mr. D. Balfour, M.L.S., C.E., F.G.S., civil engineer, Newcastle-on-Tyne, presented plans and estimates for a scheme of main sewerage and sewage disposal for the town of Knareborough, which the Board agreed unanimously to adopt. The scheme shows two main outfall sewers, one for the east part of the town, by Chain-lane; and the other for the west part, along the side of the River Nidd, joining together at Grimbald Bridge, thence to the land for sewage disposal at the Haugh's farm, lower down the river, where the sewage will be purified by the process of intermittent land filtration, without the use of any chemicals whatever, sufficient and suitable land being there available. The scheme being carried out to avoid the impending injunction by Lady Hewley's trustees for polluting the Frognare Dike, which passes through the Haya Park estate before reaching the River Nidd.

**KNARESBOROUGH SEWERAGE AND SEWAGE DISPOSAL.**—The drainage of the district is just now engaging the attention of the Local Board, who have under consideration a scheme of sewerage and sewage disposal, prepared by their Surveyor, Mr. Heward. It has been referred to Mr. C. E. Bruges, A.M.I.C.E., of Westminster, who, we understand, has reported favourably to its adoption, subject to certain modifications recommended.

**STEAM DISINFECTOR.**—The Banbury Town Council are about to erect a steam disinfectant at their Infectious Hospital, and have authorised the Borough Surveyor to visit Manchester and report upon one offered by Messrs. Bradford & Co., of Salford Iron Works.

## STAINED GLASS AND DECORATION.

**MEMORIAL WINDOW, EXETER CATHEDRAL.**—A memorial window to the late Earl of Devon has just been unveiled in Exeter Cathedral. The window, which has been placed in the north aisle, represents the vision of Jacob and other incidents in his life, and has been executed by Messrs. Clayton & Bell.

**MURAL TABLET, TIVERTON.**—A mural tablet of alabaster in memory of the late Mr. D. Powell has been placed behind the choir stalls at Tiverton Baptist Chapel. The tablet was executed by Mr. H. Hems, of Exeter.

## FOREIGN AND COLONIAL.

**FRANCE.**—The Ledru-Rollin Convalescent Asylum for Women is to be built shortly at Fontenay-aux-Roses (Seine).—Doctor Didot, an old army surgeon, has erected at Livry-sur-Marne a large building for the reception of aged and infirm persons.—The jury in the competition of the "Société des Habitants à bon marché" has just given its award on the designs at present on exhibition in the Hôtel de Ville. The first premium has been awarded to M. Georges Guyon, the second to M. Blanchard, the third to M. Dupuizard and Cintrat, the fourth to M. Armand Lignoux. A certain number of honourable mentions have been equally distributed.—The Municipality of Chartres has acquired an electric clock which has replaced the old thirteenth century clock at the cathedral. The new cathedral clock is electrically connected with the Mairie, and in case of fire or for any other cause an alarm can be sounded on the bell by an official at the Mairie.

—The National Society of Antiquaries of France has elected the following as officers and council for the ensuing year: President, M. Corroyer, the Inspector-Général des Edifices Diocésains; Vice-Presidents, the Comte de Lasteyrie and the Abbé Duchesne; Secretaries, the Comte de Rougé, and M. Flouquet.—It appears that it was incorrect for at all events premature to report that M. Foucart was appointed to the French School at Athens. He has, as was stated, an archaeological mission to Egypt, and to leave him free for this, M. Homolle has been appointed to the School.—The Egyptian Government has conferred the position of "Secrétaire-Général des Musées et Fouilles" on M. Hervé Basile, a connexion of M. Maspero.—A committee has been formed to raise, by public subscription, a monument to the poet Emile Deschamps, at Bourges, on the occasion of his centenary next year.—The following is a brief description of the monument erected from the designs of Basile, at Ville d'Avray, by the house in which Gambetta died: on an immense plinth of the red Alsatian sand-stone is placed a pedestal of simple design carrying a statue of Gambetta, more than life size, standing and grasping the French standard. On the front of the pedestal is a bas-relief with two female figures representing Alsace and Lorraine, seated back to back with an "Autel de la Patrie" between them. The monument is framed within a kind of portico, a half-ellipse in plan, bearing as decorations the arms and the names of the principal towns of Alsace and Lorraine. At each extremity is a kind of pylon bearing the arms and devices of Strasbourg and Metz. The monument is placed on a terrace to which access is gained by a portico with a pediment adorned with emblems of the Republic. The monument has been erected by

public subscription in Alsace-Lorraine. There is some talk of bringing the remains of Gambetta from Nice to re-inter them by or beneath this monument.—It is stated that the Société des Architectes de la Seine Inférieure protest strongly against the project for connecting Paris with the sea, as they say the execution of it will interrupt the road communications of Rouen and will alter the whole valley of the Seine and destroy its picturesque effect.—The bringing to Paris of water from the Vigne and Verneuil necessitates the construction, in the park of Versailles, of a vast subterranean reservoir, access and aeration to which will be obtained by fourteen shafts, now being sunk. The Municipal Council of Paris has voted 300,000 francs for this operation.—The death is announced of M. Jean Edme Pertuisot, architect, at the age of 59.

**BERLIN.**—The exhibition of designs for a memorial church to the deceased Emperor William I. has now been opened, and the Emperor's taste in awarding the first prize to "Baurath" Schwechten is being much criticised. The nine designs on exhibition give little cause for remark, excepting that the fact that the competitors seemed to have very different ideas as to the essential requirements of a modern Lutheran place of worship. As to style, Romanesque is predominant.

—According to the Budget, 1890-91, now before the Imperial "Reichstag," Berlin is to have two new military barracks, at a total cost of some 5,300,000 marks. A garrison steam-laundry is to be erected at a cost of some 380,000 marks.—In order to assist Berlin workmen wishing to live in the outer suburbs of the capital, the fares for artisans and labourers on the local trains are to be reduced to a minimum.—The theme for the annual Schinkel competition for 1892 has been decided on. The programme (made under the auspices of the Berlin "Architekten-Verein," and with the approval of the Government) requires candidates to send in designs for a "people's theatre" with some 3,000 seats placed amphitheatrically. The designs for the Schinkel competition, 1891, are now being handed in, and will be decided on by February next. The subject is a Royal Palace in the old Bellevue Park outside Berlin.—The work of completing and restoring the spire of St. Mary's Church, before alluded to, is to be placed in the hands of the City Architect, "Stadtbaurath" Blankenstein.—In reference to the International Art Exhibition, which will be held here next summer, we hear that the managing committee will lay special stress on having Spain well represented in their halls. A well-known German painter, F. Posart, has been sent to Madrid, on behalf of the committee, to see to their interests, and to make arrangements as to the easy transport of exhibits. We hear that the committee hopes to obtain the loan of several "old masters" from the "Prado" collection, which would have a special room given them in the Exhibition buildings.

## MISCELLANEOUS.

**THE SANITARY INSTITUTE'S EXAMINATION FOR INSPECTORS OF NUISANCES.**—At an examination for Inspectors of Nuisances, held in London on December 4 and 5, by the Sanitary Institute, ninety-five candidates presented themselves. Questions were set to be answered in writing on the 4th, and the candidates were examined *vis-à-vis* on the 5th. The following fifty-one candidates were certified to be competent, as regards their sanitary knowledge, to discharge the duties of Inspectors of Nuisances, viz., Messrs. T. O. Allen, T. W. Bailey, J. G. Banks, F. L. Bell, W. E. Benjamin, A. W. Blackburn, H. Blackman, H. K. Black, J. R. Blockley, F. J. Bostel, J. Budd, W. H. Barton, W. Butler, A. C. Cole, G. E. Coxill, W. R. Cronk, S. Cullum, T. H. Culver, A. I. Fairry, H. R. Fulkin, R. Fisher, J. Goddard, J. Gough, M. Grice, W. H. Grigg, F. Hartnoll, A. Heenen, H. J. Jackson, R. Jewsbury, H. W. Johnson, S. Johnson, J. W. Kirk, C. Lewis, C. F. Liscombe, F. W. Mason, G. E. Merredew, R. E. Miners, G. T. Misselbrook, A. G. Moore, D. Nicholas, F. Scott, T. H. Small, W. Stollery, T. F. Thomas, J. H. Till, J. Twiss, H. P. Webb, and T. Woodhouse.

**HARBOURS OF REFUGE.**—The German Government, which has of late years taken great interest in the safety and welfare of the fishing fleets on the North Sea, intends constructing a row of small harbours of refuge along the coast. Such harbours works have already been commenced at Nordeney and Samsitz (both popular German summer resorts), and designs for similar works at Hele and Borkum are on paper.

**PROPOSED TECHNICAL SCHOOL FOR WARRINGTON.**—A scheme has been drawn up for the establishment of a technical school at Warrington. It is proposed that the Museum and Library Committee of the Corporation shall take over the School of Art, and become responsible for science and art teaching in the borough in connexion with the free public library and museum, to establish a complete technical school for day and evening students, to be open to all classes of both sexes, and to establish scholarships of 10*l.* a year, with a free education for two years at least, open to both sexes.



## COMPETITIONS AND CONTRACTS.

## COMPETITIONS.

Nature of Work.	By whom Advertised.	Premium.	Designs to be delivered.
Hospital for Infectious Diseases.....	Blean U.R.S.A. ....	10l. 10s.	Jan. 21.
Drinking Fountain, with Clock, &c. Longdon .....	The Committee .....	5l. 3s. and 2l.	Jan. 31.

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Roadmaking Works .....	Lewisham Bd. of Wks.	Official .....	Dec. 22.
Sea wall and Breakwater .....	Wilton-on-Naze Imp. Com.	E. F. Harvey .....	Dec. 22.
Beverage .....	Runcorn Imp. Com.	do. ....	Dec. 22.
Crossings and Bridges .....	India Office .....	J. Charles & Sons .....	Dec. 21.
Twenty-two Houses, Milton-place, Leeds .....	Douglas Union .....	do. ....	Dec. 21.
Gasworks (Gravel) .....	Gasworks Co. .....	do. ....	Dec. 21.
Iron and Steel Castings .....	Gasworks Co. .....	do. ....	Dec. 21.
Additions and Alterations to the Cale .....	Gasworks Co. .....	do. ....	Dec. 21.
Electric Light Fittings .....	Gasworks Co. .....	do. ....	Dec. 21.
Asphalting, Lower Heyford, Northampton .....	Gasworks Co. .....	do. ....	Dec. 21.
Waterworks .....	Gasworks Co. .....	do. ....	Dec. 21.
New Bridge over River Stour .....	Gasworks Co. .....	do. ....	Dec. 21.
Stone-work at Cemetery .....	Gasworks Co. .....	do. ....	Dec. 21.
Additions to Premises, Abingdon-street, Northampton .....	Gasworks Co. .....	do. ....	Dec. 21.
Streets .....	Gasworks Co. .....	do. ....	Dec. 21.
Supplying Cast-iron Pipes .....	Gasworks Co. .....	do. ....	Dec. 21.
Artificial and Laying Pipes .....	Gasworks Co. .....	do. ....	Dec. 21.
New Freestone, Ringwood, Ireland .....	Gasworks Co. .....	do. ....	Dec. 21.
Five Cottages, North, Rhondda Valley .....	Gasworks Co. .....	do. ....	Dec. 21.
New Aber Branch Railway .....	Gasworks Co. .....	do. ....	Dec. 21.
Police Station, Vauxhall .....	Gasworks Co. .....	do. ....	Dec. 21.
Enlarging Police Station, Vauxhall .....	Gasworks Co. .....	do. ....	Dec. 21.
Additions, &c. to Hospital Buildings, Leamington .....	Gasworks Co. .....	do. ....	Dec. 21.
Roadmaking, &c. .....	Gasworks Co. .....	do. ....	Dec. 21.
Heating Apparatus, &c. &c. Public Baths .....	Gasworks Co. .....	do. ....	Dec. 21.

## CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
New Scavenging Cart, &c. ....	Leeds Corporation .....	Official .....	Jan. 5.
Flat Road Metal, &c. ....	West Sussex C. Co. ....	Chas. Adcock .....	Jan. 6.
Two Purifiers, with Grinders, &c. to carry .....	Sheffield United Gas .....	do. ....	Jan. 6.
School Buildings, Hanley (700 children) .....	Light Co. ....	P. W. Stevenson .....	Jan. 6.
Roadmaking and Paving Works .....	Hanley School Board .....	W. Sykes .....	Jan. 7.
Pipe Sewer &c. ....	Palham Vestry .....	J. P. Harrington .....	Jan. 7.
Widening between Telford and Reading .....	G. W. R. Co. ....	Official .....	Jan. 7.
Additions to Fire Engine Station and .....	do. ....	do. ....	Jan. 7.
Waterworks .....	Winstford Local Board .....	J. Waring .....	Jan. 8.
Waterworks .....	Epping R.S.A. ....	K. Egan .....	Jan. 8.
Waterworks .....	Ware U.R.S.A. ....	F. R. N. Hawell .....	Jan. 10.
Alterations and Additions to Town Hall .....	Testenbury Town Coun. .....	Medland & Son .....	Jan. 10.
Waterworks .....	St. George's the Martyr .....	do. ....	Jan. 10.
Sale of Gatehead Old Workhouse .....	do. ....	do. ....	Jan. 11.
Roadmaking Works, Aldershot .....	War Department .....	do. ....	Jan. 11.
Sinking Two Deep Wells .....	S. Staffordshire W. W. Co. ....	W. Vanderg .....	Jan. 11.
Right House, Upper Armlay, Leeds .....	J. Eastwood .....	do. ....	Jan. 11.
Waterworks .....	Geo. Davidson .....	do. ....	Jan. 11.
Fire Through Houses, Horticultural Gardens Estate, Leeds .....	do. ....	do. ....	Jan. 11.
Cast-iron Columns, Steel Joists, &c. for New Coca Works, York .....	H. J. Rowntree & Co. ....	Malcolm, Starke & Rowntree .....	Jan. 11.
Reconstructing the "County Inn," New-castle-on-Tyne .....	do. ....	do. ....	Jan. 11.
Boring Works .....	Hartford Colliery, South Shields .....	Montgomery & Carr .....	Jan. 11.
Additions and Alterations to "Newcastle Hotel," Morpeth .....	do. ....	do. ....	Jan. 11.
New Schools, Station Town, Wigan .....	Hutton Colliery Coal Co. Ltd. ....	Stewart & Spicer .....	Jan. 11.
Excavating and Removing 1,000 cubic yds. of Material .....	J. Hartley & Co. ....	do. ....	Jan. 11.
Bakery Premises, Dublin .....	Heron, Connelly, & Co. ....	J. J. Farrell .....	Jan. 11.
Supply of Furniture .....	Schell .....	Official .....	Jan. 11.
Limestone Road-metal, Port Talbot, near Swansea .....	Edw. Knox .....	do. ....	Jan. 11.
Coal Depot, Stables and Stores, Tarrow .....	Armstrong & Co. ....	do. ....	Jan. 11.
Alterations to Premises, Bath .....	Wills & Dornier .....	S. J. Newman .....	Jan. 11.
Alterations to Premises, Bath .....	Wills & Dornier .....	G. M. Biley .....	Jan. 11.

Those marked with an Asterisk (\*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv, and vi.

**THE RAPID DESTRUCTION OF AMERICAN FORESTS.**—We learn from a Government report on the forests of the United States that deforestation is going on rapidly. The chief drain upon the timber supply of the country is by the railways, about 73,000,000 cross-ties or sleepers being annually needed for the construction of new roads, or the repair of existing lines. This is equivalent to about 365,000,000 cubic feet of timber. The various woods are estimated to be used in about the following proportions:—Oak, 45,000,000; pine, 12,500,000; red, white, and California cedar, 5,000,000; chestnut, 3,500,000; hemlock and tamarack, 2,500,000; red wood, 9,500,000; cypress, 1,500,000; and fir, 500,000 cubic feet. About 60,000,000 cubic feet additional is required annually for bridge and trestle work, so that a total of over 400,000,000 cubic feet of wood in the shape of round timber may be assumed to be cut every year. This requires the cutting of the best timber from probably more than 1,000,000 acres of natural forest lands, and to furnish this amount continually it is calculated that not less than from 10,000,000 to 15,000,000 acres of well-managed forest would be required, or, with the present absence of management, have to be reserved for the purpose would have to exceed 50,000,000 acres, or more than 10 per cent. of the present forest area of the United States.

**NORTH SEA AND BALTIC CANAL.**—Of late the workmen employed in moving the upper layers of soil on the canal line have come upon a number of valuable relics of olden times, among which are some excellent examples of tools of the "Stone Period." Among the most interesting finds made was the one in the bog district near Königsförde, consisting of skeletons in full armour of six knights, and another, at a place called Voerde, of a set of old swords, with massive gold hilts.

**IMPROVEMENTS AT THE BRISTOL DOCKS.**—The Bristol Docks Committee met on the 8th inst. at Avonmouth Dock, and on the spot considered some important proposals for the development of that dock. They decided to proceed with works which are estimated to cost over 12,000l.; but the recommendations of the Sub-Committee to spend 65,000l. on a graving dock, and 34,000l. on the extension of the present dock, were not approved, because the traffic and the income do not, in the opinion of the Committee, justify such a heavy outlay at present. The engineer was, however, instructed to submit for consideration a smaller scheme of extension of the dock accommodation, at an estimated cost of 4,000l.

**THE ENGLISH IRON TRADE.**—The English iron market continues depressed, and is likely to remain in that condition until the New Year has been well entered. There is very little demand for pig-iron, and when sales are made, they are of iron held in second hands; as makers, being still fairly well booked, keep out of the market. There has been a little more life this week in the Glasgow warrant market, but prices have not recovered. Cleveland pig is unchanged in value, but Bessemer iron has declined 6d. a ton. Manufactured iron is dull and has a downward tendency. Staffordshire bars and sheets are 5s. a ton cheaper. There is great competition for orders for steel. Rails are 2s. 6d. lower. Shipbuilders and engineers continue fairly well engaged.—Iron.

**LABOURERS' DWELLINGS, LIVERPOOL.**—At the weekly meeting of the Insanitary Property Committee, held on the 12th inst., in the Municipal Offices, Liverpool, the question of providing cheap dwellings for the labourers who become dispossessed of their homes through the demolition of insanitary property was discussed at some length. The City Surveyor submitted a scheme by which it is proposed to make certain small buildings, called "erections," for the benefit of the poor families in question. These structures would be divided into tenements of one room and two rooms respectively. No decision was come to, the matter being adjourned to a future meeting.

**ROYAL METEOROLOGICAL SOCIETY.**—The usual monthly meeting of this Society was held on Wednesday evening, the 17th inst., at the Institution of Civil Engineers 25, Great George-street, Westminster, Mr. H. F. Blanford, F.R.S., Vice-President, in the chair. The following papers were read:

1. "Note on a Lightning Stroke, presenting some features of interest," by Mr. R. H. Scott, F.R.S. On January 5, a house near Hailly, near, was struck by lightning, and some amount of damage done. A peculiar occurrence happened to a basket of eggs lying on the floor of one of the rooms. The shells were shattered, so that they fell off when the eggs were put in boiling water, but the inner membrane was not broken. The eggs tasted quite sound. The owner's account is that he boiled a few eggs from the top of the basket, the rest were "made into a mummy," "the lower ones all flattened, but not broken." 2. "Note on the effect of Lightning on a Dwelling-house," by Mr. A. Brewin, F.R.Met.Soc. This is an account of the damage done to the author's house at Twickenham, on September 23. 3. "Wind Systems and Trade Routes between the Cape of Good Hope and Australia," by Capt. M. W. C. Hepworth, F.R.Met.Soc. 4. "Report on the Phenological Observations for 1890," by Mr. E. Mawley, F.R.Met.Soc. 5. "The Climate of Hongkong," by Dr. W. Dobereck, F.R.Met.Soc.

**LIVERPOOL ENGINEERING SOCIETY.**—The fourth meeting of this society for the present session was held at the Royal Institution, Colquitt-street, on Wednesday evening, the 10th inst., when the President, Mr. Ferdinand Hudleston, Assoc. M.Inst. C.E., being in the chair, after the usual routine business, Mr. Thomas L. Miller, Assoc. M.Inst. C.E., introduced a description of some refrigerating apparatus, which had been adopted under peculiar circumstances for the preservation of provisions at a gold mine in Peru. The construction of the apparatus, and the manner in which it was worked, evoked considerable discussion among the members present. Mr. Miller also brought before the notice of the meeting a proposed system for the measurement of the elongation of test samples, and gave statistics of a number of tests which had been made in connection with this proposed system, illustrating his remarks by blackboard diagrams. A vote of thanks was unanimously accorded to Mr. Miller for his interesting communications. The President announced that the annual dinner of the society would be held at the Adelphi Hotel on January 14, 1891, and that an excursion would take place on January 21, 1891, to the Liverpool Electric Supply Works.

## RECENT PATENTS:

## ABSTRACTS OF SPECIFICATIONS.

17,381.—SLIDING-SASHES: P. Beveridge.—The window, which is the subject of this patent, is made to open inwards to facilitate repainting and cleaning. In the left-hand pulley-shaft are two dove-tailed grooves, one for each sash. On the back of each hinge is a dovetail block to slide in these grooves to keep the sashes in position when opened out for cleaning. When closed they are lowered in the usual way with weights and cords. No parting-head is used, but the lower sash works against a square chime formed in making the case.

17,382.—IMPROVED HITCHING: A. Pape Smith and others. The object of this patent is to improve the hinges of stables in the direction of safety, economy, and efficiency. The hay-rack is moveable, and actuated by a spring opened out for cleaning. When closed they are lowered in the usual way with weights and cords. No parting-head is used, but the lower sash works against a square chime formed in making the case.

1,989.—TREATING DOORS: H. Held.—Counter-balanced by weights connected by strong wire ropes, all the doors are made to open at once, whether locked, to prevent panic or danger.

6,800.—WINDOW-SASH FASTENER: J. Lacey.—This fastener comprises a lever, which is connected to a curved edge eccentric to the axis, about which the lever can turn. A hook projection is applied to the other window-sash or part to be secured. The extension of the lever is turned inwards to engage the hook.

15,678.—PLASTERING COMPOSITIONS: W. A. Robinson and J. F. Terry (U.S.A.).—These compositions are stated to consist of several novel ingredients, and the commingling therewith of sawdust saturated with a solution of lime, alum, white lead and water, hair, sand, and plaster of Paris and glue, with water in sufficient quantities to make it pliable.

## NEW APPLICATIONS FOR LETTERS PATENT.

December 1.—19,514, W. Trousdale, Fastener for Cupboards and other Doors.—19,534, J. Lupton, Firegrates.—19,537, J. Thompson, Ventilators.—19,562, W. Thompson, Building Structures.—19,594, G. Boisselier, Mosaic Tiles, &c.

December 2.—19,699, T. B. Beech and H. Dixon.—Automatically supply fuel to kilns, brick ovens, &c.—19,605, G. Abernethy, Draught Excluders for Windows, Doors, &c.—19,618, M. Wadsworth, Boring, Bushing, Reaming, and Slotting Wood.—19,646, R. Gardner, Sash Balances.—19,646, R. Smith and R. Hamond, Metallic Cement.—19,654, A. Booth, Sewing Machines.

December 3.—19,837, C. Morrill, Saw Sets.—19,712, J. Baily, Roofing.—19,741, W. Press, Saw Sets.—19,741, W. Press, Saw Sets.

December 4.—19,763, D. Baker, Closets and Fittings.—December 5.—19,836, J. Beddow, Reversible Locks and Latches for Doors and Gates.—19,841, G. Harrison, Stanch Traps.—19,842, W. Stange and J. Grubb, Boxes for Ceilings and Wall Conductors for Electrical Conductors.—19,871, W. Bryan, Water Waste Preventer.

December 6.—19,827, J. Burdon, Ventilating Gratings.—19,827, J. Burdon, Ventilating Gratings.—19,858, A. Bohme, Striated Stones or Bricks for Floors, Sills, Ceilings, &c.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

17,294, W. Press, Window Sash-fastener.—17,652, J. Parker, Windows.—17,658, J. Clarkson, Sash-pulleys.—18,465, A. Louis, Air-heating Stoves and Fireplaces.—18,514, J. Child, Plaster.—18,574, A. Drummond, Glazing Structures.—18,672, E. Ward, Jointing the ends of Pipes.—18,768, A. Smith, Exhaust Ventilator and Chimney-pot.—18,806, W. Forster, Door-fastener.



ings, &c.—18,833, R. McAlpine, Home Building, 18,830 A. Gonsalves, Staircase—18,331, W. Stevenson, Plastic Brick-making Machine—18,992, H. Doulton and S. Leach, Tiles, &c.—18,992, W. Smart, Drying or Burning Bricks, &c.

COMPLETE SPECIFICATIONS ACCEPTED.

Opened on February 20th.

20,538, E. Young, Preventing the Rattling or Shaking of Window Sashes—2,163, W. Barnes, Joiner's Crane or Floor-dock—2,871, C. Edwards, Bricks, and Fire-clay Substitutes—17,853, T. Butler, Glue Compounds.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

DECEMBER 1.—By Messrs. Spelman (at Norwich): "The Crown" public-house and malthouse, St. Benedict's, Norwich, t. r. 1371, 2,700; two f. houses, with shops, 1,800; the North Silk Mills, warehouses, &c., f. 1,600; the South Silk Mills, warehouses, &c., f. 1,075; several workshops and warehouses, Westwick f. 2,210; f. two houses, &c., two plots of f. land, New Rd., 185; a range of buildings and plot of f. land, f. 1,554; a plot of land and erections thereon, 1a. r. op. f. 1,350; two warehouses, work-rooms, and factory, f. 1,350.

DECEMBER 8.—By E. Millard: 23, Connaught-st., Hyde-pk., ut. 33 yrs., gr. 74, r. 1001, 1,500; 25, Great Castle-st., Oxford-st., ut. 3 yrs., gr. 40, r. 1101, 4101, 13, Great Portland-st., ut. 13 yrs., gr. 60, r. 1800, 9000; 20 and 21, Pt. 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# The Builder.

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### The Evidence before the Westminster Abbey Commission.



AS we have already observed, a good deal of the evidence laid before the "Commission appointed to enquire into the present want of space for monuments in Westminster Abbey" is of considerable interest, though we have yet to learn the conclusion which the members of the Commission have deduced from it. That this conclusion, whenever it comes to be formulated and published, will be a rational and well-considered one is almost guaranteed by the composition of the Commission, which is a striking contrast in this respect to the Commission on Westminster Hall. We commented strongly, in speaking of that Commission, on the absurdity of appointing, to consider a difficult architectural question, a Committee of persons, the majority of whom were totally unacquainted with the subject, and were apparently appointed merely because they were respectable members of the House of Commons. Our comments aroused the wrath of the Chairman of that Commission, but they appear to have been not altogether without result, since we find that the next Commission appointed to consider a similar question, viz: that now sitting on the question of Westminster Abbey extension, though much smaller in numbers than the Westminster Hall one, consisting in fact of only six members besides the Secretary, includes among those six a very eminent archaeologist (Sir Henry Layard), the President of the Royal Academy, and the President of the Institute of British Architects, besides the First Commissioner of Works and the Dean of Westminster, who have a kind of *ex officio* claim to sit on such a Committee. That is the kind of way in which a Commission on such a subject would ordinarily be constituted in Paris, but it is a new thing in London to find a Royal Commission on a matter concerning art constituted in so rational and suitable a manner. It is to be hoped that this will be established

as a precedent for future Commissions dealing with the same class of questions, and that the wording of the formal preamble, "reposing great trust and confidence in your knowledge and ability," will not again be such a farce as it may be said to have been in the case of the Westminster Hall Commission.

The subject as considered by the Commission so far, as indicated by the course of the evidence, resolves itself into several distinct questions: whether it is desired that Westminster Abbey should still be a place of burial for distinguished Englishmen; whether there is room for more interments and monuments in it; if not, how additional room should be provided; and whether any disturbance or removal of existing monuments is to be countenanced. This last consideration has an important practical bearing on the whole question. If it were to be ruled that some of the largest and what are now considered the most aesthetically obnoxious monuments were to be removed from the cathedral—those especially which were erected to persons whose fame was in reality by no means commensurate with the size of their sepulchres—of course the question of space would for a considerable time in advance be answered, the rather as we have now arrived at the point of perceiving that it is the beauty of artistic design rather than the size and mass of a monument that go to render it worthy of a great name. Upon this question, however, we have only one answer to give, and that most emphatically: no tampering with or removing of the existing monuments in the Abbey ought to be sanctioned or thought of for a moment, unless as a matter of absolute necessity—for getting an approach, for instance, to a proposed new chapel. It need hardly be said that we are as fully alive as any one can be to the esthetic defects of many of these monuments, and their architectural incongruity with the building in which they stand. But there are points of more importance in such a case than architectural fitness. Those monuments were admitted by former custodians of the Abbey as memorials to persons who hoped thereby to be remembered to posterity, and who, if not all gifted or famous, were probably in nearly all cases worthy of honourable memory. To remove them now would be

not only to impair the historical interest of the Abbey, but it would be to break faith with the past, and to set a precedent for the future that a monument in a sacred building has not the hallowed rights formerly supposed to be attached to it. The architect to the Abbey, we regret to say, appears not to be sufficiently impressed with this reverence due to the memorials of the dead of other ages, and wishes to remove some of the monuments for purely architectural reasons, and in order to make his restoration of the portions of the Gothic edifice which have been injured in the erection of the later monuments. If he could in removing the latter also replace the original Medieval work intact, there would be something more, perhaps, to be said for it; but he cannot do that, and his restoration will be of no value. That Mr. Pearson should be ready to do this will surprise no one after his treatment of the Apostles in the north transept window; but we are glad to see that other witnesses of weight pronounce most emphatically against any kind of meddling with the existing monuments. Mr. John Evans, in answer to the question whether he would object to such removal "even in the case of monuments to persons who are unknown and forgotten," answers "they are buried there, and if their memorials are there, I do not think we have any right to destroy them." Mr. F. H. Jeune, on the legal question, says that in his opinion the Dean and Chapter have no power to move any monument in the cathedral in opposition to those who are interested, i.e., representatives of the family of the person to whom the monument was erected. The Archbishop of Canterbury goes into the subject largely in his evidence. He remarked that there was a loss of substantial sentiment if you once led people to think that the monuments were disturtable. Further on, speaking of the incongruity of styles among the monuments, he says:—

"I have not the slightest objection to the great variety. Well, one hideous monument has gone away from the Abbey, a monument which we all regarded as hideous, but the persons who put the monument there, the best critics and architects of their time, they did not think it hideous in their time, and a time may come when their view will come back. I do not think the historical sentiment should be interfered with, because there is in a

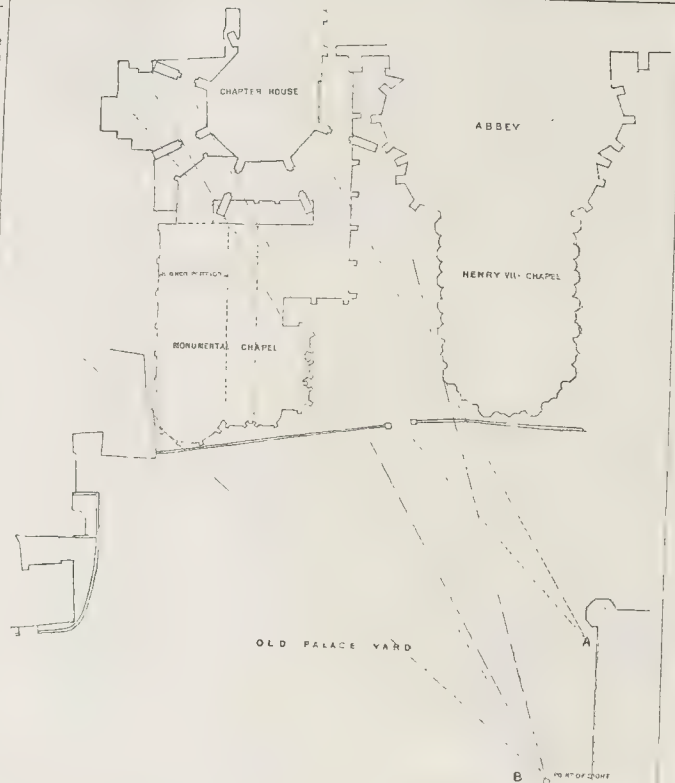
small part of such a vast building a hideous monument.

Mr. Somers Clarke expresses the same opinion, that people who were buried there have a right to remain there, and their descendants have a right to require that they should be undisturbed; and there is a significant little remark from the Dean, when the Chairman observed that the whole corner where the beautiful Fawcett memorial stands was overshadowed by the enormous monument to Captain Cornwall,—"That is the earliest monument erected at the national expense to a naval officer." Considering what the naval history of England has been, could any charge of ugliness or abnormal size in such a monument justify its removal?

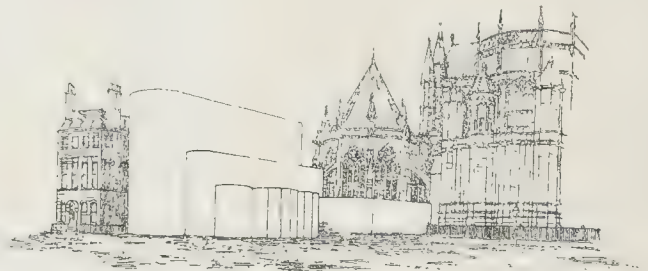
One idea which crops up, we observe, is that if a new monumental chapel is built, some of the largest monuments might be moved into it partly to relieve the crowding in the existing building, partly,—as appears to be oddly suggested on one page of the report,—that they would give a kind of sanctity to the new chapel, start it as it were, or, as is still more irreverently said by another speaker, "act as decoy ducks." The very reverse would be the case. The mere commencement of such a proceeding would take away the whole feeling of historical continuity in regard to the Abbey monuments, and convert them into furniture to be shifted here and there as might be convenient.

The question whether it is really and generally desired in the future that men who have deserved well of their country should be given sepulture in the Abbey as a mark of honour comes almost outside the scope of the powers of a Royal Commission, and can only be decided by popular opinion at large. Recent events seem to show that the feeling is still as strong as ever; but on the other hand, it must be remembered that the right to Abbey sepulture is far more sparingly bestowed in the present day than in earlier times. The evidence of the Dean of Westminster on this subject is a most interesting piece of history, tracing back to the time when mere parochial juxtaposition gave a title to burial in the Abbey precincts, as in an ordinary parish church. The idea of the Abbey as a place of distinguished sepulture dates, however, a long way back. The fame of Poet's Corner, the Dean thinks, commenced from the probably accidental burial of Chaucer at that spot. Spenser was the first person buried in the Abbey as a distinguished poet, and on account of such distinction, and naturally he was laid near Chaucer, and so the poetical character of this part of the Abbey became established. Among other statements of interest in the Dean's evidence was that about the claim possessed by the family of the Percies, the Duke of Northumberland's family, to be buried in the Abbey, independently of the permission of the Dean. But the whole of this evidence forms a chapter of the greatest interest in regard to the past history of the Abbey, and renders the Blue-book containing it worth having on that account alone.

The evidence of Mr. Wright, the Clerk of Works to the Abbey, is in its way also a very curious document, in regard to the information it gives about former interments and the present subterranean state of the Abbey. Mr. Wright knows where all the dead lie for several generations back, apparently; all the known or renowned dead, at all events, and some of the unrenowned. His estimate is that there is now, with care, and if excavations may be made in the concrete of the north transept (on which he had his refers to Mr. Pearson's judgment), room for about seventy more burials within the Abbey itself. Mr. Pearson considers this estimate too large, because it includes burial in portions which are known to have been used for former interments, or two successive burials in the same superficies of ground. This is a merely sentimental objection of course, as in fact it matters nothing whether two coffins be divided laterally or vertically by intercepting earth; but it is a sentiment which many no



Sketch Plan of New Chapel adjoining Chapter House, as proposed by Mr. Pearson.



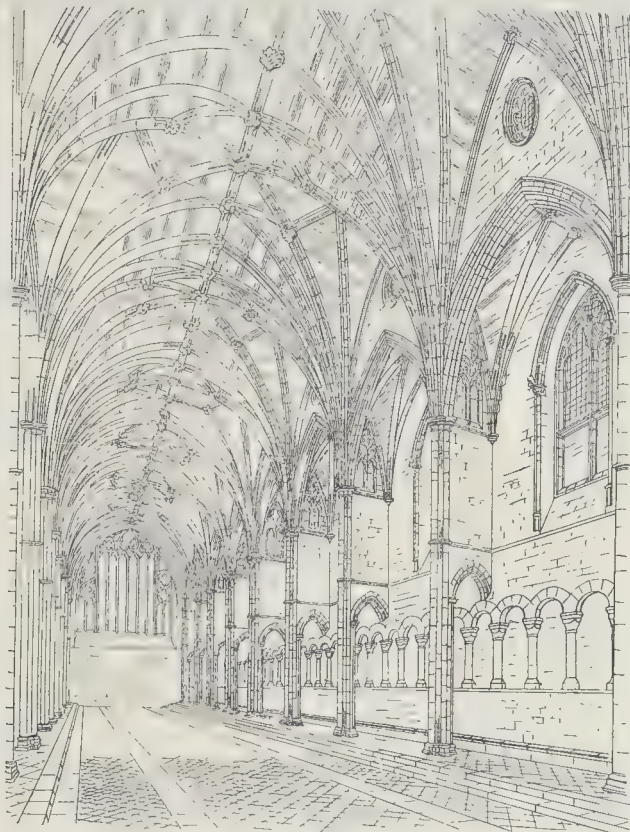
Sketch showing space occupied by New Chapel adjoining Chapter House, as proposed by Mr. Pearson.

doubt would feel, and we cannot call it an unreasonable one. The cloister garth was mentioned by Mr. Knowles, in his article in the *Nineteenth Century*, as a place where future interments could be made; but the evidence of Mr. Wright is to the effect that this has been nearly occupied by former interments already, though no precise details, as far as we have observed, are given as to this. We may conclude, however, from the evidence, that in the matter of interments alone the available space is now very limited. If we were to contemplate the adoption of monuments merely, the actual interment being elsewhere, we consider (in spite of Mr. Wright's opinion to the contrary) that Mr. Knowles' diagrams of the four cloister walls and their existing monuments show conclusively that there is space for a long time to come for monuments of this class on the cloister-walls; monuments which could be rendered important rather by artistic perfection than by size. One objection to this is that the cloister is

not the church; it is, however, very closely connected with it, and has at all events far more of the *genius loci* about it than any new monumental chapel could have for many generations to come. But monuments apart from interment will not, we believe, satisfy the acquired sentiment in regard to the Abbey. It is the exceptional honour of the remains being received into that time-hallowed temple which forms the essential element to be considered. The general adoption of the system of cremation would no doubt alter the conditions materially, and would make the cloister at all events a satisfactory expedient for many generations to come; but we are hardly as yet in a position to count on the general adoption of cremation within a short period.

The general conclusion therefore is that as neither interment without a monument, nor a monument without interment, would satisfy the present sentiment as to the Abbey as a mausoleum, if such a use of the Abbey is to be continued, the time must very shortly





Perspective View of Monumental Chapel proposed by Mr. Pearson on the Site of the Ancient Refectory.

come when an addition to the Abbey would be a condition of carrying on the practice. Now, if the question be merely the architectural one of adding to the Abbey without deforming it, the solution would not be a very difficult one. But that is not all. It is essential that any new portion added for this purpose should be as much as possible a part of the Abbey church. It is in the Abbey that people desire to see a great man receive the honour of sepulture, not in a new building only remotely connected with the great church. And this consideration seems at once to dispose of the plans which suggest a separate building at the eastern or south-eastern part of the church, approached by a passage round the chapter-house. Mr. Pearson has three different suggestions to make. The first is a chapel to the eastward of the chapter-house, for which two plans are suggested, one placing the chapel rather further south than the other. We give a reduced copy of the plan for the more northern one, and of the sketch showing the extent to which it would shut out the view of the Chapter-house from Old Palace-yard. The other plan shows the same chapel moved 25 ft. further south, the only advantage in this being that of leaving open a clearer view of the Chapter-house from the same point. It will be seen that Mr. Pearson gets rid of the intrusion of the Chapter-house buttresses into his chapel, making a passage under them. Architecturally we see no reason against this at all; the only objection to it is that it does not fulfil what we regard as the desideratum, that of intimate union with the Abbey church. It is out of the church, and places the monuments out of connexion with the

series within, and it would not be regarded as burial in the Abbey. The second scheme is to acquire and restore the remains of the Refectory, or rather to make a modern Gothic interior on the site of the Refectory, working in such of the old work as is left. The view of the proposed interior, of which a reduced reproduction is appended, shows in itself a very pleasing and suitable interior, and as a matter of sentiment it has the recommendation of being within the remains of a portion of the ancient buildings, and being approached from the church not by a new but by the old cloister. So far it is, as a matter of sentiment if not of fact, in closer connection with the Abbey than the proposed new chapel at the eastern end of the Abbey. There would be some practical difficulties as to the claims of Ashburnham House in regard to light, &c.; but we do not attach very much importance to these matters, which could probably be arranged without much difficulty. There is still the objection, however, that the new place of tombs is out of the church, though as a building abutting on the ancient cloister, it may be considered as having a tolerably close connexion with the church.

The third scheme proposed by Mr. Pearson is that of a north aisle to the nave, abutting on the west side of the north transept, but stopping rather short of the west end of the nave, and with a projection northward on the block plan which looks like a large porch. No sketch is given of the proposed architectural treatment. There is also a modification of the addition on the north side, of which no plan is given. The two are described as follows in Mr. Pearson's evidence:—

"Referring, firstly, to the scheme on the north side, which seems to me to have the distinct ad-

vantage of affording a building which would be an integral portion of the structure, and to which the sentiment so strongly attaching to the Abbey would thus extend, I have made two alternative plans. One of these takes the form of an additional aisle to the nave, with chapels attached for the display of monuments and with communications leading to it from the west end of the nave and from the north transept. I have not the least doubt that such an aisle, well designed, in a style which would be distinct from the adjoining part of the Abbey without being out of harmony with it, would form a great addition to the general effect of the structure, both externally and internally.

It will be readily understood how well the recesses between the great buttresses and other recesses provided in the plan would lend themselves to the arrangement and display of monuments. It should be borne in mind, in considering an addition of this character, that nearly the whole of the stone work of the existing structure which would be enclosed by this aisle is a modern restoration, and not in the best character.

My second plan takes the form of a double cloister glazed on both sides, enclosing a garth with approaches from the Abbey similar to the previous scheme. The four sides towards the garth I propose to divide into chapels, by transverse walls, and the recesses formed by the great buttresses of the nave would also be available as before. I consider that the first of these two schemes would form a greater improvement to the Abbey than the second."

The second of these two schemes would probably be the one which would meet with the least opposition, and it would be architecturally the easiest to deal with. But it is a far less dignified scheme than the additional aisle, and moreover is, again, not so much an integral part of the church. The evidence indicates, however, that the opposition to a north aisle scheme is likely to be strong. The Archbishop of Canterbury, after expressing the opinion that the addition, however made, should be in the closest possible connexion with the existing church, went on to say that while the north aisle would give the closest connexion, he thought there were so many objections to it that "the next closest ought to be taken," and in answer to a question from the Chairman (Mr. Plunket) he further stated his objections as follows:—

"It is the only part of the Abbey in which you see the whole design of the church by itself; the south side is so entirely blocked up by other buildings and the east end is so altered by Henry VII.'s Chapel, and blocked by St. Margaret's, the projection of the chapter-house is so great, and the alteration of the west end is so great, that there is no other part of the Abbey which gives you an idea of what was the original design of it as a great church. Therefore, the erection of any building against it, even if it were a low building, would completely block out the original conception of the Abbey, and would prevent a view of the elevation, and then, amongst all the cathedrals of England, it would be the one which could not be seen. The interior alteration would be also great."

There is a great deal of reason in this, and we give full weight to it. There is no doubt that architecturally the scheme of a chapel in the south-eastern portion of the church is a very much easier problem, in regard to architectural grouping and connexion with the present church. But the question, as already observed, is not purely an architectural one, and it is a mistake to regard it in that light. The question is to get the closest approach to being a part of the Abbey Church in such a way as not to be architecturally an anomaly. It can hardly be said that the addition of another aisle is an architectural anomaly, considering how many are the four-aisled and five-aisled Mediaeval churches in existence; and in regard to the Archbishop's objection that it shuts out or interferes with the only general view of the present church, it must not be forgotten that (as Mr. Pearson took care to point out) the north exterior of the nave as at present existing is not the genuine original architecture, and is not, as an exterior, of much value historically, or even architecturally; nor do we see that the treatment of the problem in that way may not be an architectural addition to the *coup d'œil* of the building as seen from the north-west. Mr. Pearson's ideas as to the treatment are to be gathered from the following passage in the evidence:—

"My idea is that the chapel should be as much a part of the Abbey as possible, and that the



feeling that people have as to being buried in the Abbey and of having monuments erected in it should not be weakened in any way, and that by adding to the nave you would make the addition part of the Abbey,—absolutely part of the Abbey.

538. Would that chapel rise to a height equal to the height of the Abbey?—No, sir. I have two schemes, one to make it as high as the side aisle of the nave, and another to keep it down some 15 ft., and, in that case, making in the spaces between the buttresses and low buildings underneath the eills of the windows, the highest part in that case would be 35 ft. inside.

539. (Sir F. Leighton.) Would that obstruct the light?—It would, to some extent.

540. (Mr. Waterhouse.) Then there would be no light to this chapel, except on the north?—Yes, there would also be a clearstory. There would be an entrance from the transept here underneath the window, and here also in the nave aisle underneath the window, besides the external entrance to the west.

541. (Sir F. Leighton.) It would be a small church rather than an aisle?—It would be so in point of size.

542. (Chairman.) I suppose the architecture would be as identical as possible with the old Abbey?—No, sir, I would make it of a late style, to show that the building was an addition.

543. (Sir F. Leighton.) It would be a twin building; by the side of the Abbey?—Yes; you frequently see in old churches large aisles added.

544. (Chairman.) Would the roof be resting against the old Abbey, or an independent one?—It would rest or abut upon the Abbey at this end.

545. Would it be an independent building at this end?—It would be.

546. What would you remove? Nothing.

547. (Sir H. Layard.) No tombs would be removed?—No tombs, only some tablets on the walls where openings in the new aisles would come, and these could be replaced by the side of these entrances."

This gives a pretty fair idea of what the addition would be as contemplated by Mr. Pearson. Externally we do not see that it need be any disfigurement of the architectural ensemble of the Abbey; but rather the reverse. As to the idea of building it in a later style of Gothic, so as to show that it was an addition, that may be open to question. If there was a nineteenth-century Gothic, the use of that would of course tell the tale plainly. But merely to adopt, say a late fourteenth-century style to show that it was not part of the original thirteenth-century building, would only be to adopt a slightly different form of architectural illusion. The more logical course would seem to be to treat the addition, in its general lines, in a manner to harmonise with the nave architecture, while

"Perhaps some modern touches here and there" would tell the tale of the actual date of its erection: harmony of general style, without copyism of detail in every respect.

There is one objection to be raised, however, when we come to consider the north aisle as regarded from the interior of the Abbey. Mr. Pearson proposes merely two doors of access to it, one from the nave and the other from the north transept. The mere practical objection to this constructional interference, suggested by Mr. Somers Clarke, who said it "would knock the building about," is not of any importance. With a strong timber bracing between the buttresses, any alteration to the intermediate walls could be carried on without danger to the structure. But the more important objection is that in that case, after all, the new aisle would no longer be an aisle, but as Sir F. Leighton observed, "it would be the next room," and would form no part of the vista. To say as Mr. Clarke does, that "it would be more out of the church than going through Poet's Corner" (and afterwards through a new corridor to a chapel entirely removed from the main building) is merely a natural exaggeration on the part of a hostile witness. But the general objection is a valid one. We will suggest a way out of this. In architecture [the boldest thing is often the best. Build the new north aisle, then, not with a lean-to roof but with a gable roof, with its internal gutter sufficiently above the head of the present north aisle windows. Make the new aisle of the same architectural ordinance as the existing one, with the same windows: take out the glass from the existing windows and replace it in similar windows on the north side of the

new aisle. Four of these windows are memorial windows in stained glass, but they would merely be removed to a similar window opening opposite to their present situation. Remove the few monuments on the north side of the present aisle which stand up above the window sills, and replace them in the new aisle: they are only a few, and here again it is only moving them perhaps a few feet from their present position. Leave the present window openings and mullions as they are, with the spaces open between them. Supposing the new aisle to have been built, we should then see from the nave a series of open mullioned arches with a screen wall at the base, and through these we should see the vault and part of the interior architecture of the new aisle, which would then appear, in Sir F. Leighton's words, "as part of the vista," part of the Cathedral itself, only shut off by a screen in the lower portion with two doors in it. If an extensive addition to the Abbey for monumental purposes is actually called for, that is the way we should propose to carry it out: a method which would render the new aisle architecturally a portion of the general interior of the church, seen by the eye from the nave and entered by a door from the nave and from the exterior: an addition which would not only satisfy the demands of sentiment, but might be capable of adding to the Abbey a new and very fine interior effect.

#### METAL-WORK.\*

BY J. STARKIE GARDNER.



Y business in life is to work with, and not to talk about, metal-work. This is, however, the occasion of an Art Congress, and I can only imagine that the invitation to lecture here was addressed to me because I am a stranger to you. As a Londoner I am deprived of that profound knowledge of the craft that exists in Birmingham, the result of the accumulated experience of centuries; but, on the other hand, I come more in direct contact with the most educated section of the public, and am in a better position to discuss the directions in which the taste of the public is moving. And I see with profound regret that it is travelling in an opposite direction to that which, speaking broadly, and not of the exceptions, Birmingham manufacturers are taking. It would be mere affectation to ignore that Birmingham work is conspicuous by its rarity or absence in our London Arts and Crafts Exhibition, that it is not holding its own in the estimation of London architects, and that it is out of harmony with the styles of decoration in vogue with our best decorators. If the patterns Birmingham puts on the market are used, it is under a sort of protest, and the laments are continual that, taking bedsteads for an example, brass bedsteads have to be used which destroy the whole harmony of a room. Now you know as well as I do that if a real demand exists which you cannot or will not supply, the demand will very soon find its supplies elsewhere. Taste and fashion permeate downwards. There are still large classes who buy Birmingham patterns, but the tide is irresistibly against them, and the art metal trade of Birmingham must collapse before the assaults of its better-equipped enemies, unless it sets about meeting them on equal terms. Mr. Whitworth Wallis wished me to devote the evening to the analysis of pieces of metal, to explaining why some are good and others bad; but I take a grave view of the condition of Birmingham art metal-work, and to talk of such details appears to me like discussing questions of diet when the patient is *en extremis*. Before proceeding further, I should like to explain what decorative art is, for our conceptions about it and what course it is likely to take are extremely hazy, even if we have formed any conceptions at all. If we talk over the possible developments of elec-

tricity or engineering, we base our ideas on what has been before. But whoever heard about any one arguing rationally about the development of art? In persistently treating art as a matter of caprice and fashion, like the whims of a lady, we wilfully shut our eyes; for, actually, art is only a highly-cultivated but still wholly ordinary instinct of nature, and, as such, just as subject to definite laws as any other force in nature. As humanity has developed, so art has developed, the course of both being one chequered course of progress from the most primitive stages to the highest developments. The ceaseless changes of style are simply manifestations of ceaseless progress. Usually they have been accomplished by the slow modification or addition to that which pre-existed, consequent on the instincts implanted in us, which makes progress a necessity, and mere copying and reproduction hateful. Exceptionally they have been brought about by the meeting of two previously isolated styles, as when the Egyptian and Assyrian arts met on Greek soil, to be fused by the genius of a new race into the Classic; or when the flower of Western Europe, suddenly dazzled by contact with Oriental splendour, laid the foundations of Gothic architecture. But it required even in the case of Classic art five hundred years, from the days of Homer to the building of the Parthenon, to bring it to perfection, and scarcely less to mature Gothic art into the culminating richness of Henry VII.'s and St. George's Chapels.

Gentlemen, I claim that if we reflect upon the whole history of art we see that it teaches us that we cannot create, we can only develop; and designers, when they have accepted this truth, have learnt the secret of the art they are called to practise. Man can no more create a new style than Nature can create a new animal. A gifted individual may hasten its progress; but extravagance, the result of haste in art, is like the monstrosity in Nature,—it bears no offspring. Again, art, to be lasting, must be in unison with the genius of the people. You can no more acclimatise an exotic art, if it runs counter to our habits, our comforts, and our climate, than you could bid crops of rice and sugar-cane to replace our wheat and turnips.

Till recently the course of art has been easy to follow; but those who deal with art in this nineteenth century have to deal with a very exceptional state of things, the like of which has not been seen since art began. Down to the early years of this century, art, in some form or other, had been the one outlet for the energies of the peaceable and cultivated section of humanity. Art had been all in all, when, suddenly, Art's younger sister, Science, came out, and by the splendid beauty of her achievements, turned the heads of all beholders. What wonder if, with the marvels of steam, electricity, and gas, and the profound changes made by them in our habits, all crowded into a few years, Art should have been cast aside and forgotten? Not only these applied sciences, but the abstract sciences,—chemistry, physics, physiology, geology,—have filled men's minds, and made the nineteenth century a century of science such as the world had not beheld. Art had been flowing serenely, like a broad river, when this young leviathan ploughed so rudely across, that its troubled surface is only now, at the close of the century, beginning to yield some broken reflections of its ancient self.

During the eclipse of art, manufacturers had little need to trouble about it, and, as long as new season's patterns were produced, shopkeepers bought, and the public bought, so that we have had for many years a long succession of mere commercial patterns.

But now the sun of art is re-emerging. For thirty years schools of art, numerous exhibitions and loan collections, facilities for travel, and our museums, have been incessantly and profoundly turning the public taste, and we see not only an appreciation of pictures and sculpture, but of bric-à-brac, which comprises everything we use,

\* A Lecture to Working Men. Delivered at the Birmingham Art Congress.



even down to the humblest household utensils. We are all groping about to pick up the broken thread. It is no wonder if the public take their ideas of what is good from what is set before them in museums rather than in shops; and it is coming to this—that the classes for whom we have to cater will not trust themselves to buy anything unless it recall some museum object. It is utterly vain and futile to imagine that taste will even go back into its former vitiated grooves, and all the Queen Anne and Neo-Grec treasures of styles that have been produced will shortly be as extinct as the Dodo.

The question is, Will Birmingham continue to stand aloof while the trade passes from it to other towns and other countries; or will it make an effort to take once more the place its vast resources entitle it to take? You may depend upon it that unless you can meet the demands of people of good taste you will not be long permitted to meet the demands of others. Why should not Birmingham be again what it was thirty years ago in the Gothic revival,—that first symptom of reviving art, when it led the van and was uncontestedly the metropolis of good metal-work?

Now, unfortunately for Birmingham, the fact that it profited in an exceptional degree by the activity of science has seemed to sever it more completely from the traditions of art. All peoples, all cities even, have their epochs of prosperity and progress, and periods of repose and decadence. Is Birmingham resigning itself to one of the latter? Will it continue to sleep while the trade passes from it to other towns, and, worse, to other countries? Is it to the credit of Birmingham that Chiswick should lead the way in designing copper and brass; that Frome should revive the "Cire Perdue" process; that we should have to send to Naples to get good castings, to Paris for good chasing; that in our great revival of wrought iron work Birmingham should have lagged, not led, so that ten times more is done out of Birmingham than in it; that enamelling, an art that has always had a home in this country, should be almost dead; and that in exhibitions the exhibits of Tiffany, Christophle, and a host of others are incomparably finer than ours?

The dearth of rivalry,—that wholesome stimulant,—has been injurious to Birmingham, but, to judge by the signs of the times, Birmingham will not be cursed with any lack of it in the future.

To resume its place, those great employers who have the plant and capital should attach and associate themselves with those who have proved their talent, instead of leaving them to exhaust the best years of their lives in founding businesses which either wither up or develop into dangerous rivalry. Every metal business pretending to supply goods into which art enters, should have one artistic partner, not an aesthete, but with practical knowledge of the requirements of the trade; and it should have a sufficiency of designers, and these should be Englishmen.

This brings us to the question of design. It is the fashion to talk a good deal of "high falutin'" about going to the fields and gardens and taking your designs straight from nature, or being manly and independent and evolving them out of your own conscience. But I don't see that these professors practice what they preach. Art lives in cities among communities of workers, working in friendly rivalry, and not in the fields. More has been done for art in the flat plains of the Netherlands, or swampy lagoons of Italy, than in all the places where nature is fairest together. Does architecture borrow from nature? Did our grandest craftsman, Alfred Stevens, or do Alfred Gilbert and Walter Crane, though adepts in the secrets of nature, draw their inspirations from it, or from reminiscences of the heaped-up stores of artistic experiences of the past? Nature is a good corrective, but not a good diet, and the designer should take it in homeopathic doses. No grand decorative artist ever was inspired by nature direct, and you can but rarely use the crude forms it sup-

plies just as they are. To test this, try to use a shell—beautiful objects to use in any design—and you will find yourself compelled to abandon any close adherence to its lines. Or make up sprays of flowers or leaves, and see how difficult it is to use them in any design. When we require organic forms in decoration, we do not take horses and cats and dogs and men as we see them, we resort to griffins, harpies, cherubs, mermaids, sphinxes, satyrs, and everything as far removed from nature as possible. If we want a fish, it is the conventional dolphin, because it is quite unlike anything real. While as to foliage, we escape recourse to nature by using the conventional forms of acanthus, vine, arum, and pomegranate, forms brought under control by generations of modifiers, to fit them to the purposes of art. I must leave this theme, however, though reluctantly. A recently-issued catalogue of art metal-work, entirely taken from Nature, not Birmingham, I am glad to say, is the most egregious thing ever seen. Such catalogues are a slur on the country. You will not be surprised if I say, go to the museums and copy those things which you can make use of. Don't turn a grand Renaissance helmet upside down and make a coal-box of it, nor a shield by Cellini into a wall-plate for a common paraffine lamp, especially if the lamp must be supported by the haft of a common nineteenth-century sword-bayonet. These, like the designs from Nature I have just referred to, are I am sure, employers' or managers' inspirations, and when anything is right down bad and vulgar, it is always some pet fad of some conceited body who is destitute of the remotest pretence to art-training, but with the unhappy power of forcing them on public notice. Use common sense at the museum, and when you have exhausted all the useful objects, you will find inexhaustible stores of hints and suggestions in the next. Don't become aesthetic, or join the camp of the aesthetes, for taste in art is not concentrated in the productions of any modern clique whatever, but beware of conceit, and get as good a mastery of styles as you can, and then take your own course.

I have only one more point, and that is as to the styles you should endeavour to take up. We should most undoubtedly begin by reviving all that was good in English art, for that sits best in English houses. Unfortunately, the art of our own country is exactly what you do not get in English museums, and Birmingham is no exception. Museums abroad are mainly devoted to the work of their own country; but here, what little we have is flooded and lost in the sea of Italian and German objects with which they are crowded. This places us at a great disadvantage, for Germans, Italians, and French have enormous material to copy from, and do use it well; and inundate our market with reproductions and adaptations which pass current with the public for museum objects. The present generation of the general public, to whom decorative art is as new as the tall hat and frock coat to the Sandwich Islander, do not perceive that these when bought are, as a rule, wholly out of place with their surroundings and not in the least adapted to their requirements. A copy of a sanctuary lamp will not light a room unless you spoil it, and modern candles are not meant to be stuck on spikes. To go back to obsolete inconveniences is like spinning our wool by hand again; and, fortunately for us, Germans and Italians are both bad designers, and are only dangerous as long as they stick absolutely to copying. France is formidable, for its art has always been so interwoven with ours that it is almost at home in English surroundings. The French, moreover, can design in their own styles with perfect taste and accuracy. The French will probably run us hard, but we must hope our superior adaptability will stand us in good stead, and that we may at least win on our own ground. Let us begin, however, I say, by being English, and mastering our own styles thoroughly. We must know their origin, growth, development, and technique

as the doctor knows diseases. We must know, as the French do, almost instinctively what the workers in these styles would have done.

I have now no more to say than to thank you for your patience with me, and to assure you that, though a rival in a small way, for my works are quite insignificant, I have a profound respect for your great city, and consider the maintenance of its prosperity a question of national honour.

J. S. G.

#### NOTES.

**T**HE memorial of the "Society for the Preservation of the Monuments of Ancient Egypt," to which we referred recently (page 400, ante) was sent in to Lord Salisbury a few days ago. But while we were assured that Lord Wharnccliffe, the President of the Society, had concurred with the suggestion of the Institute of Architects to petition for the appointment of "an Official Inspector fully qualified" to take charge of the monuments, leaving the question of nationality open, we now find that in the letter from Lord Wharnccliffe accompanying the memorial it is stated that the memorial is presented in two forms,—first, as praying for the appointment of "an English official," the other, in the words first quoted, for that of "a competent official." The letter continues:—

"The change thus effected in the scope of the memorial was not made until the first form in which it was circulated had been numerously signed, and I would call your Lordship's attention to the point that those whose signatures are attached to the first memorial are not necessarily in opposition to this change, which some of the signatories thought it advisable to have made before attaching their names or proceeding further in the matter."

The letter concludes:—

"I beg, therefore, your Lordship's favourable consideration of the memorial, which I forward herewith, and further that your Lordship will cause it to be communicated to H.M. Agent and Consul-General in Egypt, for the information of the Egyptian Government, as expressing the opinion of many eminent Englishmen on the question of the Preservation of the Monuments."

Among the long list of signatures appended to the memorial in its first form appear those of Mr. Armistead, Lord Armstrong, Professor Blackie, Lord Bramwell, Mr. Ford Madox Brown, Mr. John Evans (President of the Society of Antiquaries), Professor Flower, Mr. Ernest George, Mr. R. C. Jebb, Sir James Linton, Mr. Mahaffy, Mr. Du Maurier, Professor Middleton, Mr. F. C. Penrose, Mr. Norman Shaw, Mr. A. C. Swinburne, Mr. Alma Tadema, Mr. Chas. Waldstein. Among the names appended to the "competent official" memorial are those of Sir A. Blomfield, Mr. T. Blashill, Mr. Ewan Christian, Professor Hayter Lewis, Mr. Waterhouse, and a good many other architects, this form of the petition having been brought more under the notice of the architectural profession; we also find in the list the names of Mr. Percy Gardner, Sir F. Leighton, Mr. Mundella, and Sir Richard Temple. These names are sufficient to show how widespread is the interest felt in this subject among able Englishmen of various professions and classes.

**T**HE correspondence between the Council of the Institute and Messrs. Flockton & Gibbs, which appears in the last number of the *Journal of Proceedings* of the Institute, in regard to the Sheffield architects' ill-advised scheme of patenting their plan for the arrangement of municipal buildings, includes a concluding expression of opinion by the Council which we imagine will be accepted by most of our readers as embodying the common sense of the matter. The following is the portion we refer to:—

"The Council have learnt that, under the terms of Section 11 of the Patents Act, 1883, they have no power to oppose the grant of such patent to you; but, had the power existed, they would have opposed it in the interests alike of the profession and the public, and because the course proposed to be taken by you is inimical to the interests of



the profession, and one likely to bring you into serious conflict with other architects.

The Council trust that this expression of their opinion may induce you to withdraw your application for the patent; and they beg you to remember the honourable tradition of the English medical profession, not to take out a patent on subjects relating to that profession.

The Council are further of opinion that, even if the plan be patented by you, the patent cannot be sustained."

In regard to the last sentence, we are also of opinion that the arrangement of the plan of a building cannot be the subject of a patent. It is not a new mechanical or scientific invention; but merely a question of arrangement; and in any case it would be hardly possible to make out absolute priority in such an arrangement. We published one of the plans and Messrs. Flockton & Gibbs's letter a few weeks ago, in order to show what they proposed to claim, but we believe it is a mistaken attempt, in every sense. From the final reply of Messrs. Flockton & Gibbs to the letter above quoted, we gather that they are disposed to follow the advice of the Council; in doing which they will not only act gracefully, but probably spare themselves and others a good deal of unprofitable worry and contention.

WE learn from the last number of the *R.I.B.A. Journal* that Mr. Andrew T. Taylor, Hon. Secretary of the Institute for Canada, has forwarded to the Secretary of the Institute a copy of the Constitution and By-laws of the Province of Quebec Association of Architects. Special difficulties there existed, owing to the fact of two nationalities,—English and French,—being prominent; but they have been overcome, and nearly all architects in the province, having joined to form this Association, are now seeking an Act of incorporation. The general body of members is to be divided into three classes,—namely, Members, Student-Associates, and Honorary Members. Article IV. defines the status of an architect as follows:—

"An architect is a professional person, whose occupation consists in the artistic and constructive designing of buildings, and in supplying the drawings, specifications, and other data required for carrying such design into execution; also in exercising administrative control over the operations of contractors employed in the construction of said buildings; in officiating as arbitrator of contracts, and stipulating terms of obligations between proprietor and contractor."

Article V. of the "Constitution" is framed upon the lines of the declaration required by the Institute from its professional members, while Section VIII. of the "By-laws" of the Quebec Association provides for Examinations.

FOR several years the idea of having a good harbour at the mouth of the Elbe has been talked about in Germany, and the Berlin *Deutsche Bauzeitung* now publishes an illustrated description of the harbour-works proposed, and from this description we see that the Senate of the Hanse Town, Hamburg, intends having constructed on and near ground owned by them at the mouth of their river, near Cuxhaven, a first-class harbour for the purposes of (1) affording convenient arrangements for the quick landing and taking-off of passengers and mails to Atlantic liners, as well as for purposes (2) of refuge in winter time, when the Elbe is ice-bound, to vessels unable to reach Hamburg on that account, or to vessels unable at all times of the year to reach the port 100 km. up the river on account of being disabled. The plans as they now stand show an ordinary enclosed sea-water harbour subject to tides, of the size of 300 by 250 metres, with an additional extension running an extra 300 metres inland, and eighty metres wide, the whole basin with a low-water depth of eight metres throughout being entered by an opening of 100 metres, enclosed on either side by solid harbour-heads with frontages 120 metres long, running parallel to the current of the tide. Three years would be required to construct this

harbour, at a cost of about 7,000,000 marks, or nearly 350,000*l.*; and 80,000 marks would be the annual expense for keeping the harbour in condition, which latter expense would, however, be easily covered by the 90,500 marks offered by the Hamburg "Packetfahrt" Line, as fixed annual sum to include all landing dues of their boats and rent for 200-metre frontage of quay (30 metres deep) for erection of sheds, passengers' offices, &c. It being taken into consideration that the proposed harbour is chiefly or rather entirely to serve for passenger purposes, no cranes, warehouses, &c., are to be erected, the special comfort of passengers being provided for by having the Harburg-Cuxhaven Railway line continued to harbour head. For the purposes of the North-Sea Fishing Fleets the old Cuxhaven harbour is to be enlarged and deepened at a cost of some 600,000 marks, this piece of work, when complete, giving the fishermen a well-protected sheet of water, 137 by 218 metres, with a depth at low water of 24 metres, the entrance having 50 metres width.

WE have before us an account of some fresh-water algae which are known to infest reservoirs on the Atlantic sea-board of the United States and elsewhere. The author, Mr. Geo. W. Rafter, explains that these minute plants are very hardy, having been found in active growth in water covered over by a sheet of ice more than 1 ft. in thickness, and whilst some only live in water containing sulphur, iron, salt, or other particular mineral matter, &c., in solution, others prefer the purest water. The bad tastes and odours imparted to drinking-water by these algae arise, he believes, from their jelly, starch, oil, or sulphur-producing properties, and good reasons are advanced in support of this hypothesis. He found especially that a particular species, containing much starch with chlorophyll granules, gave out a very offensive odour when in an advanced stage of decomposition, and on experimenting with starch and water he artificially produced a similar result. Other varieties detected impart a cucumber taste; and he has successfully demonstrated that the pollution of the water-supply of Rochester (N.Y.), in 1885, was largely due to a certain alga which caused a fishy taste and smell. In discussing preventive measures he advocates the covering-in of reservoirs, aeration, rapid circulation of the water, and in some cases efficient sand-filtration. In congratulating the author on the production of this important contribution to knowledge, we may point out that the methods of counteracting the evils alluded to, although clearly induced by purely philosophic reasoning, have long been known to engineers from their practical value, and within certain limits those methods have undoubtedly proved efficacious. The late Mr. J. F. Bateman, C.E., speaking of the contamination of a reservoir at Warrington some years since, for example, gave a striking illustration of the fact. Although the water was filtered as well as it could be, it very soon became filled with various kinds of growth, and after much consideration it was decided to cover over the reservoir. This was effected, without emptying it, by erecting vertical pillars supporting cross beams, on which large flags were placed. As the work progressed the confervæ beneath the covered parts gradually fell to the bottom, and by the time it was finished they had entirely disappeared, and the water was delivered in a much purer condition. Precisely similar results have been experienced at the Berlin waterworks and elsewhere. There can be no question, also, that the growth of vegetation on the surface of open reservoirs is greatly retarded, and in many instances altogether arrested, when the water is more than 15 or 20 ft. in depth.

OUR Australian correspondent writes:—"The most exciting architectural plot at the present time in Sydney is the great fire in the heart of the city, which has consumed nearly a million's worth of building and stock. The writer of this note was a witness

of the conflagration, and the rapidity with which one building after another went down under the flames was a sight never to be forgotten. It commenced in a solidly-built printing establishment, which was gutted, and the walls beginning to fall down, in a little more than half an hour. The fire extended from roof to roof and window to window across narrow lanes, notwithstanding the utmost efforts of the fire brigades. Not less than six separate properties have been totally destroyed, and thirteen others have been severely damaged. Most of them were four and five story buildings, and occupied as soft goods warehouses, offices, and clubs. All the buildings were of ordinary construction, with timber joists and thin floor boards, and in several cases cut through by lift shafts, which formed furnace flues to each building. It is to be hoped that this severe lesson will teach property owners the necessity of introducing a somewhat better system of construction to resist the spread of fire. Although the loss is immense, yet, if the opportunity is grasped by the Government, a great public improvement may be made by the construction of a new street, between Pitt-street and Castlereagh-street, on the site of some of the buildings thus destroyed. The matter has been mentioned in Parliament and referred to in the press, and it is to be sincerely hoped that the idea may be carried out. This street would be a continuation of the new street just being formed in front of the Post Office, and would be the first step towards securing a wide thoroughfare right up to the site of the new Houses of Parliament in Macquarie-street."

WE have, in a prior number, referred to Germany not having its recognised "Salon," like other countries, owing to the collision of the various larger Art Exhibitions held annually at several art centres, such as Berlin, Munich, Düsseldorf, Dresden, &c., each of which try to out-do each other by offering special attractions, lenient hanging juries, and the like, to artists wishing to exhibit. Up till a few years ago, the Berlin annual "Academy" Exhibition took the lead, but in 1889 and this year, owing to nearly all the South German artists having their work hung at the newly-formed Munich "Annual" Exhibition, the low standard of the Berlin show was so marked that it was thought advisable to discontinue it in favour of that of the Bavarian capital,—the Prussian Royal Academy even going so far as to definitely decide not to hold their "Academy" next year, a decision which was, of course, hailed with great triumph in South Germany. By way of drawing the North and South together, the Berlin Art Society proposed that the southern artists should be invited to send a representative collection of works to the Berlin International Exhibition in 1891, coupling this with an undertaking that, if the Munich exhibition of 1891 were dropped, there should also be no Academy exhibition in Berlin in 1892, the Berlin artists exhibiting in a body at Munich in that year. It is perhaps not surprising that the Munich artists have rejected this offer, having even come to a determination to make their 1891 exhibition an unusually good one; but the result would have been better for the progress of modern German art if they had decided to join hands with Berlin.

MR. ARTHUR PEW, M. Am. Soc. C.E., describes in the *Transactions of the American Society of Civil Engineers* for September, a railroad constructed between Wrightsville and Dublin, two Georgia villages about nineteen miles apart, which is supposed to be the cheapest line ever constructed for a regular freight and passenger business. In the Southern and Western States it is often very difficult to procure enough money to build any kind of railroad whatever, and the engineer is often called upon to make surveys and estimates for the very cheapest and poorest railroad his conscience will allow him to build. The line, which is through moderately-rough country,



passes for the greater part through pine forests, which furnish suitable timber for bridges and other purposes. The track is of standard gauge, and was laid with a good second-hand 45 lbs. iron rail obtained from, and laid by, a neighbouring railway company, who were substituting steel for these iron rails, for 370l. per mile. The actual total cost of the line, when completed ready for the chartered rolling stock, which was used, was about 700l. per mile. The company, however, do not pride themselves so much on building a cheap road as on doing so much good work at such a small expense, and it is satisfactory to hear that the earnings of the line up to this time have been so good that in addition to paying an annual dividend of nearly 7 per cent. to the stockholders, considerable improvements have been made to the line itself.

AT a Vestry meeting, St. Sepulchre's, Holborn Viaduct, last week, it was resolved that the churchwardens be empowered to contribute 25l. to a fund for restoring the tombstone of Captain John Smith, founder of the "London Company" which colonised South Virginia. Smith, a parishioner, died on June 21, 1631; but within the next eighty years, as we read in Hutton's "New View," all traces of the tombstone had disappeared. His epitaph, however, has been preserved; it began—

"Here lies one conquered, that hath conquered kings."

He explored the river Chickahominy, and for a while was made captive by Powhatan's tribe of Indians. We are informed that Pocahontas, to whom, when a girl, Smith is said to have owed his life, came to this country as the wife of one John Rolfe, and that having died, aged 22 years, on board the *George*, a trader bound for Virginia, off Gravesend, she was buried March 31, 1616-7, in the chancel of the old church there, which, having been burnt in 1727, was rebuilt and dedicated to St. George. Pocahontas stayed seven months in England, and was received by the Queen, to whom Smith had made a petition (June, 1616), wherein appeared the first account of the way in which she saved him from her father's "braves."

A LARGE number of Americans visit St. Sepulchre's Church every year. They, in common with ourselves, must have been struck, latterly, with the pains that are taken to make a pretty garden of the southern graveyard. There is a burial-ground along the northern side, and another was made by Greenhill's-tenants, St. John-street, Clerkenwell. The church itself, one of the largest in the older part of London, has undergone many structural changes since its almost entire rebuilding by Wren. Extensive repairs were carried out in 1738; and again, by Clark, in 1790; in 1873-5 the late W. Pettit Griffith restored the tower and south porch; and two or three years later Mr. A. Billing renovated the interior, when, we believe, Wren's side-galleries were taken down. The fine organ, originally by Renatus Harris (1677), was rebuilt by Messrs. Gray & Davison. It was subsequently removed from over the ambulatory, at the western end, to within the St. Stephen's Chapel, north side. That may, perhaps, be the chapel which Sir John Popham, Chancellor of Normandy and the King's Treasurer, built in 1440, together with the porch.\* Popham died at Reading in 1463; a tablet to his memory was set up in the cloister at Charterhouse. In our review, No. vii., "Architecture at the Royal Academy," on June 28 last, we noticed Mr. W. D. Carie's design for a reconstruction of the organ in two cases, to stand at either end of a screen across the church. We may add that this church is of ancient foundation. Maitland tells us that Roger of Sarum gave it, in 1178, to the prior and canons of St. Bartholomew, West Smithfield. That gift

was subsequently confirmed by a charter of Henry III., dated June 15, 1253. Here were buried Roger Ascham, author of "The Schoolmaster," and Sir Robert Peake, who held Basing House for the King, and was Faithorne's master in engraving. John Rogers, burnt at Smithfield, temp. Mary, had been vicar.

THE Midlothian County Council have appointed a committee, with powers to deal with the Society of Writers to the Signet in regard to acquiring a piece of ground belonging to the Society, which is situated immediately to the south of the County Buildings in Edinburgh, and which it is desirable should be acquired by the Council as a site for additional buildings for the accommodation of that body. The County Buildings were erected in 1814, from the designs of Mr. Ellis, shortly before the first City Improvement was carried out. That improvement scheme involved the formation of a thoroughfare running immediately to the back of the new building, which faced a narrow close, and had no architectural features whatever. The late Mr. David Bryce, at the request of the county authorities, prepared a new architectural elevation to supersede the present unsightly one, but no active steps were taken in order to carry it out. If the County Council should carry out the erection of a new façade towards Melbourne-place, there would still remain a vacant site between the County-buildings and the Sheriff Courts. This site belongs to the Faculty of Advocates, and that body is desirous to utilise it for the extension of their library. This library is possessed of similar privileges to those enjoyed by the British Museum library, but has not similar support from Government, which is desired, in order to make the valuable library fully available to students. Were the library extended to George IV. Bridge, with a suitable façade, and the County-buildings completed in like manner, this thoroughfare would be one of the most attractive in the northern metropolis.

THE Indian correspondent of the *Times* drew attention, on the 19th, to the sudden fall of a house in Bombay, causing the death of about thirty people, and in the letter of the next day he adds that the event "has again called public attention to the necessity for municipalities adopting improved building regulations and more closely supervising the construction of new and the inspection of old buildings. The existing practice is very lax, and this is the second accident of the kind which has happened in Bombay within the last few months." We know little of the nature and extent of the official building regulations of Bombay and Calcutta, but it certainly appears from this that there must be urgent need of some more efficient system of supervision of buildings than at present exists in the great Anglo-Indian cities.

#### MYTH OF THE HOMERIC CYCLE.\*

It was with a graceful tribute to Mr. Leaf's lectures on "Homeric Greece" that Miss Harrison began on November 26 the first of the four lectures which were to continue and complete his course. That break in the traditions that appear before and after Homeric mythology, that flaw in the stratification of myths, only became completely clear to her, the lecturer said, when Mr. Leaf had explained how the Achaean civilisation represented in Homer had been preceded by a primitive people—the Pelasgians. These primitive people, after the Achaean power had been broken and laid waste by the Dorian invasion, had emerged again, and with them emerged many of their cults, which asserted themselves even in presence of that new Olympian theology which the poems of Homer had the power to impose on the Greek world. With this knowledge it became possible to understand the later complex Greek mythology, where side by side with the orderly twelve Olympians, each with well-defined characteristics and attributes, there is a

medley of small tribal gods with fluctuating duties and powers, relics of old local cults when tribes had to economise their deities. The two systems became in time more or less fused, the Olympian gods absorbing many of the local deities who were the most nearly related to them.

This may be well illustrated by the myth of the old Thessalian goddess Kyrene, who was absorbed, by steps which we can trace, into the Olympian Artemis. Starting with the version of the myth of Kyrene as told by Pindar in the ninth Pythian, Miss Harrison showed how the development of the story could be traced on three monuments. The connexion of a particular class of ancient vases with the colony of Kyrene was proved by the well-known clyx (Paris: Bibliothèque Nationale), representing Arkesilas the Second presiding at the weighing of sacks, presumably of *silphion*; next, by another clyx with the curious figure of a god seated on his own altar. Coins of Arcadia now enable us to recognise in this god Zens Lykaeos, who was worshipped at Cyrene. These two vases lead up to the most important example of this class, a clyx in the British Museum, where a female figure, surrounded by little winged men and women, is to be identified as the nymph Kyrene herself, tended by the fostering winds. She holds in one hand a twig of the *silphion* plant, the main source of the wealth of the African colony; in the other, a branch with apples, in reference to the favourite identification of the fertile Cyrenian plain with the Garden of the Hesperides. Other vases were adduced to prove this personification of the winds as winged figures: the harpies of early Greek art are nothing but the winds, not necessarily in their hostile aspect.

The myth of Kyrene is found in a relief in the British Museum, where a nymph is seen wrestling with a lion, while another nymph, Libya, crowns her victory with a wreath. This relief is late, and is no doubt a conscious illustration of Pindar; but the same scheme of the nymph wrestling with the lion is found in earlier works; for instance, in a well-known archaic bronze found at Olympia, and, which is more important, in a relief found at the same place from the pediment of the Treasury of the Cyrenians. The same type of a winged figure holding a lion by the ear and tail is to be seen also in vases from Thera or Melos. It was, in fact, the general type of the "Mistress of Wild Beasts," under which so many of the primitive local goddesses are to be brought. Other instances besides Kyrene, are Atalanta, Britomartis, Iphigenia, &c., all of whom were ultimately identified with Artemis in official theology, though locally they generally enjoyed a special, but poorer, worship by the side of the Olympian. This was the fate of Kyrene herself. Originally a local "Mistress of Wild Animals," and a goddess mother worshipped by the old Thessalian population, she was taken with them first to Thera, and then to Africa, where, as Aristotle tells us, many separate sacred rites were, as a measure of democracy, fused together. Thus, instead of being the bride of Apollo and a mother, she was converted into the virgin Artemis, sister of Apollo.

Passing, in her second lecture, to Homer's beliefs about the under-world, Miss Harrison showed that the conception of the Homeric Hades was never so victorious as that of the Homeric Olympos. The probable reason of its failure to attain supremacy over other beliefs was, that with regard to the under-world, primitive faith reasserted itself most powerfully. "Homer believes that *something* persists after death: that something is no more life, though it is called *Psyche*; rather, it is the very opposite of life, it is the shadowy double of a man deprived of all the characteristics of life. This something, as soon as the body is burnt, goes away to a place apart, remote, from which there is no possibility of return. The Homeric world is haunted by no ghosts—Patroklos himself, once his body burnt, can reappear no more; hence after the funeral there is no cultus of the dead; no offerings at the tomb, no oracular utterance: all is done." Now if we pass from Homer to examine the beliefs of later Greece, especially the popular beliefs, as they are echoed for us in the large class of grave-reliefs and on the white Attic *lekkythoi*, which were made purposely for the service of the tomb, we find that stronger than any Homeric notion of annihilation and final departure is the other belief that the dead man can haunt his tomb, can receive the homage of his survivors, enjoy the things he has cared for in

\* Stow says Popham's chapel stood on the south side of the choir.

\* Four Lectures by Miss Jane E. Harrison.



life, and even partake of food. For this conception we must look back, not to Homer, but to the races that preceded him. In the "shaft graves" and the "bee-hive tombs" of Mycenæ we had seen how the dead were buried intact and surrounded by the utensils of daily life, which the survivors believed the dead man could use in his tomb. The Homeric "break" between the earlier and the later beliefs—the fact that Homer had ceased to believe in full life after death, is to be explained partly by the poet's individual belief, partly also, by the great tribal upheavals represented by the Dorian and Achaean migrations. "When you are moving about from place to place, when conditions almost nomadic compel you to burn your dead, you tend to drop a cultus that is local and ancestral; your dead, instead of hovering about their graves, go to a common Hades and revisit you no more, uncertain where you are. But when you settle again, rebuilding home and hearth, the old local ancestral faith and ritual revive."

One of the most charming instances adduced of the fusion of the Homeric and the local beliefs was a *lekythos* with Charon preparing to ferry the dead man to Hades, while about the tomb itself are hovering little winged figures, which would be more suitable in Hades as representations of the Homeric Eridonion or phantom. In another *lekythos* Charon is curiously identified with the dead man, and prepares to snatch the offerings brought to the tomb.

The third lecture dealt mainly with the parentage of Achilles. There are two distinct versions of the marriage of Peleus and Thetis—the older story of the wrestling, which is merely one form of the world-wide *mirchen* of the sea-maiden who can change her form at will (cf. Proteus); and, secondly, the epic version of the stately wedding-feast presided over by the twelve orthodox Olympian gods. Pindar, who knows both stories, yet never confuses them. The cycle by Pithinos is one of the finest instances of the art-type of the wrestling, while the splendid frieze on the François vase shows us the marriage procession. The prophecy that Thetis should bear a child "mightier than his sire" was probably invented to account for the eclipse which an old Thessalian poem, with Peleus for its hero, a "Peleid," suffered from the rise of the legend of Achilles. Later, when it became necessary to link the story to the Olympians, the prophecy was made to be uttered as a warning to Zeus and Poseidon (Pindar: Isthmian vii.).

In the fourth lecture, the art-form of the "Judgment of Paris" was shown to be borrowed from that of the *Charites* led by Hermes to the cave of Pan. Hence the processional form which persists in vases both of the archaic and of the fine period; the actual Judgment only appearing later on. The story of the Golden Apple which, it should be carefully noted, never appears on vase paintings, possibly originated in a misunderstanding of the flowers or fruit often carried by the goddesses, as by their prototypes the *Charites*. The connection of the Judgment with the Trojan War is late, and the whole story may be due to some imaginative poet who wished to account for the partisanship of the goddesses in the war, though, originally, it was natural that the Argive Hera, and with her Athena, the special protectress of Achilles, should side with the Greeks, while the semi-Phrygian Aphrodite protected the Trojans.

With regard to Helen, the story of the rape is simple enough; but the legend told of her at the fall of Troy points to the real solution of her myth. Stesichoros and Lesches both told of the fury of Menelaos against his faithless wife, and of his relenting as he beheld her beauty. Numberless vases—where Menelaos lets fall his sword, or at the sight of Helen, or by the intervention of Aphrodite—confirm this version. Mythology, however, seeks a further explanation for the act of Menelaos. The story of the birth of Helen gives us the clue. Helen springs from the egg of the divine Zeus-swan: by birth divine, she is herself a goddess. Leda is to her a sort of foster-mother, and later legends variously give Tyndareus or Zeus as her father. But Tyndareus and Zeus are one—Tyndareus is but a name of the Zeus of Taygetus. We have here again a case of double fatherhood (other instances are Theseus and Heracles), meaning that an earlier local cult has had to give place to an Olympian cult, and Tyndareus, or Aigeus, or Amphitryon have to become the mortal father, really nothing more but the foster-father of the child of an Olympian. The exact original nature of the

Goddess Helen may be gathered from a passage in Pausanias, who says that the Rhodians worshipped her in the character of a tree goddess (*dendropeira*). The connexion with tree worship is further confirmed by Theokritos (Idyll xviii.), when the maidens who chaunt the bridal song promise to perform certain rites connected with the sacred "Tree of Helen" in honour of the bride. Helen was worshipped at Therapnai, and possibly also at Ankyra. Homer might transform this old local goddess as he would into mortal woman and sinner, yet her immortality would assert itself, and it is because she was a goddess and "the Daughter of Zeus" that the sword of Menelaos must fall powerless before her.

The Chelsea centre for the extension of University Teaching must be congratulated on having offered its students so brilliant a course as this by Mr. Leaf and Miss Harrison. Professor Warr, of King's College, in moving a vote of thanks to Miss Harrison at the close of the last lecture, suggested that it was time for students to think of repaying their lecturer by starting original work on the lines and principles which Miss Harrison has twice in this year laid before a Chelsea audience. Such work seems to have already begun in good earnest, and that this is the case is due not only to the energy and enthusiasm of the lecturers, but to the numerous facilities for work which the admirable organisation of the Hon. Secretary, Mr. R. G. Tatton, places within reach of the students.

#### THE ARCHITECTURAL ASSOCIATION.

THE adjourned special business meeting\* of this Association, to consider the revision of the rules, was held on Friday the 19th inst., in the meeting-room of the Royal Institute of British Architects, Conduit-street, Mr. Leonard Stokes, President, in the chair.

Mr. Owen Fleming, in resuming the discussion, said they were considering, when they adjourned the previous week, a motion by Mr. Stannus, to incorporate the amount of subscription in the Constitution. He (Mr. Fleming) thought very strongly that the whole question of the subscription ought to be deferred until the By-law dealing with the subscriptions should be considered. He therefore moved as an amendment, "That Mr. Stannus's motion be deferred till the question of subscription comes up."

Mr. Leverton seconded the amendment, which, on being put, was carried.

Mr. Stannus then moved the adoption of the first By-law as follows:—

"1. The objects of the Association shall, so far as practicable, be carried out by means of Papers and Discussions; a Library; Lectures and Classes; a Studio; Prizes and Scholarships; Visits to works and buildings; Periodical Publications; and by such other methods as the Committee may determine from time to time."

Mr. Pratt seconded the motion.

Mr. W. H. A. Berry moved as an amendment that the words "a studio" be omitted from the By-law. However desirable and important it might be to have a studio in connection with the Association, he did not think it necessary to make it binding upon them; at any rate, until they knew something more about it, and how it was going to be carried out. It was always open to them, if they wished to have a studio, to institute one at any time.

The Chairman remarked that the Association had already declared that it was very desirable to have a studio added to the curriculum.

Mr. Berry said he knew that, but he did not think they were irrevocably committed to it.

Mr. F. R. Farrow said that during the past year the British Institution had offered to students of sculpture, painting, and architecture some valuable scholarships. For the architectural competitions some members of the Association wanted to enter; but it was a condition of the competition that the drawings made for the studentship should be prepared within the walls of the society to which competitors belonged. They had no accommodation for that, and therefore, their men were not eligible to enter.

Mr. Berry's amendment not finding a second, fell to the ground, and after some further conversation the original motion was put and carried.

Mr. Stannus then moved the adoption of By-law II.:

"2. The arrangements for all the above methods, including the appointment of lecturers, instructors, and visitors, and the fees, &c., shall be determined by the

Committee; but members desirous of associating for the study of any specific subjects shall, with the approval of the Committee, be allowed to form classes, frame their own rules, and appoint their own officers."

Mr. E. R. Barrow seconded the motion.

Mr. W. J. H. Leverton moved, as a rider to the By-law, the following words:—

"The Committee shall have power to appoint such Sub-Committees, whether members of their own body or not, for specific subjects, as they shall think desirable."

Mr. Leverton added that the committee had already a great deal too much work to do, but under the new system the amount of work would be enormously increased.

The Chairman said he thought there was a good deal in Mr. Leverton's suggestion; but at the same time he thought that the terms of the By-law covered the object aimed at by the rider.

Mr. Hudson seconded the amendment.

Mr. Brodie said he thought the matter might very well be left to the Committee.

Mr. Cole A. Adams said he thought the interpolation of two words in the By-law would meet the case. He would suggest the insertion of the words "sub-committees," after the words "appointment of."

Mr. Hudson seconded.

After some further discussion, Mr. Leverton's rider was agreed to, and By-law II., as amended, was then put and carried.

Mr. Stannus then moved the adoption of By-law III. as follows:—

"3. Each Class shall submit a Monthly Report to the Committee."

Mr. H. O. Cresswell seconded.

Mr. C. H. Brodie asked why the annual report of the classes was not mentioned in the By-law. He moved as an amendment that the words, "annually and," be inserted before the word "monthly."

Mr. F. T. W. Goldsmith seconded the amendment.

Mr. T. E. Pryce, in supporting the amendment, asked Mr. Brodie to add as a rider the words, "That the Class Secretaries' annual reports be sent in before the end of June."

Mr. Brodie said that as they were making the session to commence in June instead of October, there was clearly no necessity to state in the By-law the date that the reports should be sent in.

Mr. Pryce then moved as a separate amendment that "The Class Secretaries' annual reports be sent in before the end of June."

Mr. F. R. Farrow, in seconding Mr. Pryce's amendment, said, in addition to the monthly and annual reports, he would like to see added to Mr. Brodie's amendment the words "and balance-sheets." It was very desirable that the committee should have the balance-sheets of the classes at the time they had the annual report.

Mr. Stannus said he would suggest the following consolidation of the various amendments:—

"Each class shall present a monthly report and an annual report and balance-sheet at the end of June in each year to the Committee."

The suggestion was eventually adopted, and the chairman then put By-law III., as amended, which was carried.

Mr. Stannus then moved the adoption of By-law IV.:

"4. Any gentleman desirous of becoming a member shall be proposed by two members, according to the form appended hereto, but the Committee shall have the power of nominating any candidate without the proposal of two members, and also of rejecting any proposal should they consider it desirable. Nominations shall be made at a General Meeting, and voted upon by show of hands at the next succeeding meeting. Voting to be by ballot if demanded, in which case the election shall be postponed for at least a fortnight, and notice given of such postponement at the meeting, and also sent to the proposers by the Honorary Secretaries at least a week before the election. In either case one adverse vote to five shall exclude from election. The Secretaries shall by letter inform each gentleman of his election."

Mr. E. S. Gale seconded.

Mr. F. T. Bagallay moved as an amendment to substitute the words "the result" for the words "his election," in the last sentence.

Mr. Sirr seconded the amendment, which was carried.

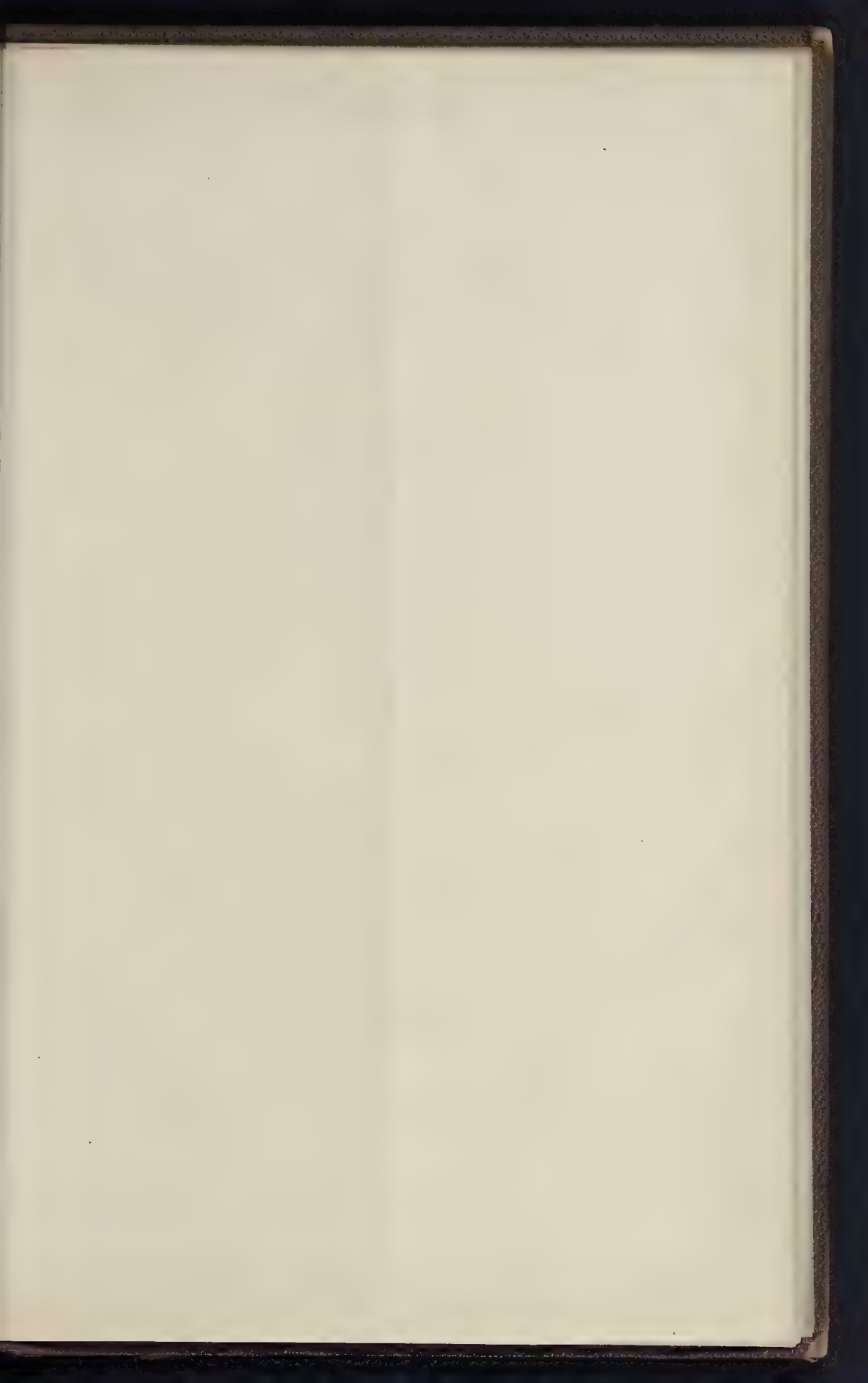
Mr. Dicksee said, at the end of the first sentence of the by-law, the word "desirable" was used; what was evidently intended was that any undesirable proposal should be rejected, and not that the desirable proposal was to be rejected.

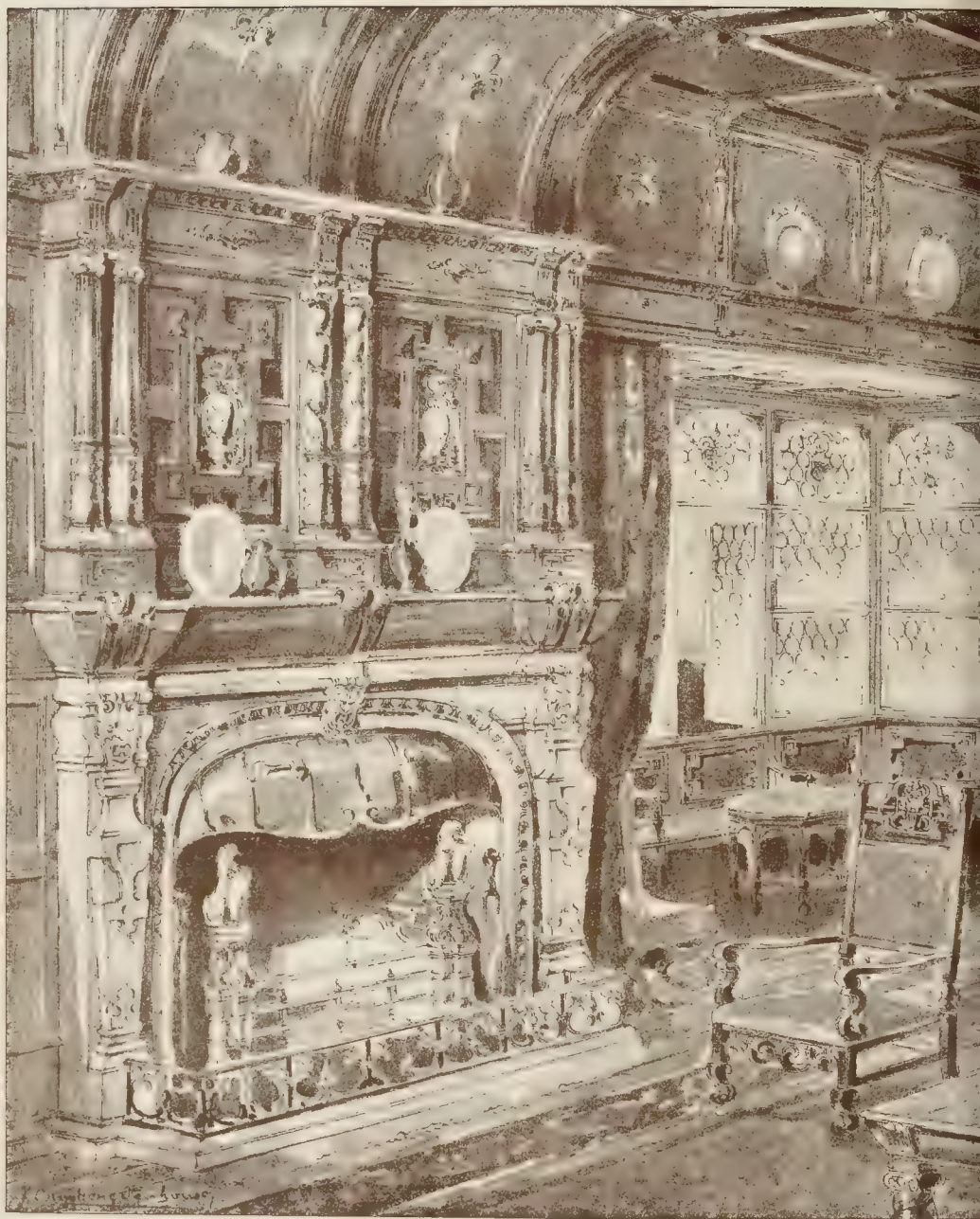
Mr. Cole A. Adams said the difficulty might be met by omitting the line "should they consider it desirable."

This alteration having been agreed to, the

\* See p. 480 ante.



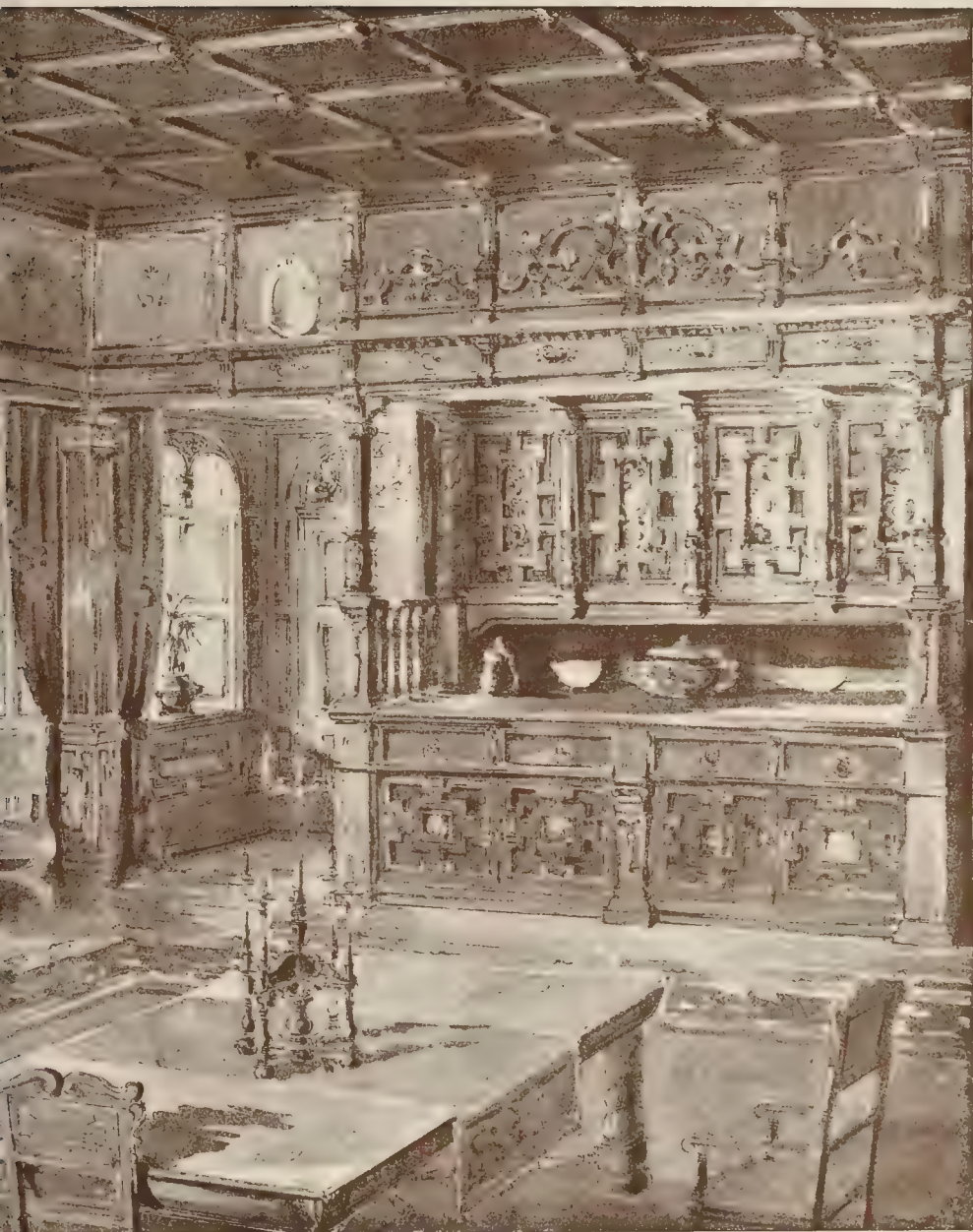




*Royal Academy Exhibition, 1890.*

DESIGN FOR DINING ROOM.





MR. J. ARMSTRONG STENHOUSE





original motion, as amended, was put and carried.

Mr. Stannus then moved the adoption of By-law V. :—

"6. A list of candidates, with their proposers, shall be exhibited in the premises of the Association during the meeting at which the nominations are made, and until the election takes place. No one whose nomination has been voted upon and negatived shall be again nominated during the same Session without the special sanction of the Committee."

Mr. Cole A. Adams seconded the motion, which was agreed to.

Mr. Stannus next moved the adoption of the following By-law :—

"6. Allied Societies may be admitted by resolution of the Committee, confirmed by a vote of the Association at a General Meeting. No alteration or modification shall subsequently be made in the Rules of any Allied Society without having been approved by the Committee of the Association."

Mr. E. S. Gale seconded the motion, which was agreed to.

Mr. Stannus then moved the adoption of By-law VII. :—

"7. Allied Societies shall have such rights and privileges, and shall contribute such sums to the funds of the Association, as shall be arranged between the Committees of the two Societies."

Mr. A. W. Earle seconded the motion.

Mr. Leverton proposed as an amendment the addition of the words, "But the details of the arrangement must be approved at the general meeting at which the admission is confirmed."

Mr. Cole A. Adams said that Mr. Leverton's intention was met by By-law VI., which had just been passed. It was quite competent for any member to ask, when a proposal came up before a general meeting, upon what conditions society was admitted, and the Committee could be bound to give an answer.

Mr. Leverton then withdrew his amendment, and the motion was adopted.

The adoption of By-law VIII. was then moved by Mr. Stannus :—

"8. The arrangement with any allied Society shall be revocable at the close of any session, by written notice on either Society delivered not later than the last day of April."

Mr. F. R. Farrow seconded the motion, which was agreed to.

Mr. Stannus then moved the adoption of By-law IX. :—

"9. The entrance-fee of each member shall be two guineas, and his annual subscription one guinea; but members residing prior to the first day of January, 1891, shall pay an annual subscription of half a guinea."

Mr. Owen Fleming moved as an amendment :—

"The entrance fee of each member shall be one guinea, and the annual subscription one guinea; but members residing, or having their place of business, outside a radius of twenty-five miles of Charing-cross, shall pay an annual subscription of half a guinea."

He said they were all anxious to see the new scheme carried through, but by By-law IX. it is proposed that the whole burden of the additional expense which would result from the adoption of the new scheme should be thrown upon the young students who would come into the Association. He considered that a most unreasonable proposition. If the resolution was carried they would have no *locus standi* whatever to approach the Institute, or any other body, and ask them for help. It had been said that some members did not get anything for their subscriptions, but whether they were helping to forward the welfare of the profession and the Association. He thought it was very necessary for the Association to subscribe to the educational scheme in its corporate capacity. It was utterly ridiculous to think that the additional expenditure in connexion with the scheme could be raised out of the students' fees.

Mr. Millard seconded the amendment. He had declined to be a party to such a mean-spirited shuffle as that proposed by the Committee.

Mr. Cole A. Adams said he had always felt that if the subscription was to be the Association could be many men who would leave the Association. It was not for them to analyse too closely the motives which might determine a man to refuse to pay to an Association a subscription which was double what he paid before. He was quite certain from what he had gathered from the young and old members of the Association whom he had spoken to on the subject, that if they agreed to Mr. Fleming's amendment there would be a large secession from the ranks of the Association. Mr.

Millard had characterised the proposal of the Committee as a shabby proceeding. He (Mr. Adams) did not see that at all. It was a perfectly fair and open proceeding. To those men who entered the Association in the future there would be advantages which they who entered it some years ago did not have. He did not think it would be harsh to those members who would join the Association under the new rule to raise their subscriptions, for there would be increased privileges. Then it was difficult to define the difference between a town and a country member. A country member might enter the Association under the half-guinea subscription, and yet he might come to town and join the studio (which he, Mr. Adams, hoped very much to see established) and classes very much in the same way that a young man who is articulated to a solicitor comes and spends a year or two in town. He believed that as education advanced, and it would advance, they could not stop it, they would have students coming up and residing in London :—

And if the amendment was carried that would give rise to a good many complications. Even looking at the matter from the point of view of the poor student, the difference between half a guinea and a guinea was not so great. Did they want to hold out that it was such a cheap thing to come into the profession? He thought they would find that in the future only those gentlemen who had had a really good education would be received as architects' assistants. Then as regarded the guinea and two guineas, was it not a fact that the parents and guardians of the young men who entered the Association, or their masters, in the case of articulated pupils, usually paid the money? The question had been carefully considered, and he thought they would show great wisdom and discretion in supporting the Committee in the line they had taken.

Mr. W. H. A. Berry said he agreed with Mr. Adams that it was not expedient to raise the subscription of the present members, but he most distinctly differed from him when he argued that the subscriptions of future members should be raised. That would be a very unfair and selfish thing to do. They themselves had enjoyed certain advantages in the Association at a given subscription, and he contended that the subscriptions of all members should remain as at present. They should go on holding out the same advantage to the present members and those who came after.

Mr. Hudson said he thought that those who paid half-a-guinea should not only be those living outside a radius of twenty-five miles of Charing-cross, but also those elected prior to January, 1891.

The Chairman then put Mr. Fleming's amendment, which was lost by a considerable majority.

Mr. A. W. Earle then moved as an amendment that :—

"The entrance-fee of town members shall be two guineas, and their annual subscription one guinea. The entrance-fee of members residing outside a radius of thirty miles of Charing-cross shall be one guinea, and the annual subscription half-a-guinea; but members elected prior to January 1, 1891, shall pay an annual subscription of half-a-guinea."

He contended that country members should have some difference made in their subscriptions, as they received such slight advantages from becoming members.

Mr. A. H. Clark seconded the amendment.

Mr. H. W. Pratt said he did not agree with the amendment, for it would be extremely difficult to define a country member. A man might enter the Association as a country member, and very shortly afterwards he might remove to town. As it was, many men gave their country addresses, and yet they were town members.

Mr. H. O. Cresswell said he thought Mr. Pratt's difficulties might be overcome. Town members might be those residing or having an office within thirty miles of Charing Cross.

Mr. E. W. Mountford said a member might be a country member for the first six months, a town member for the next three, and then a country member again for the remaining three months. What subscription should such a member pay? It had been said that country members did not obtain many advantages from the Association. He would ask whether country members were of much use to them? A town member who attended the Association, and spoke at the meetings, was worth half-a-dozen country members. He thought it would be a great mistake to make a difference in the subscriptions.

Mr. F. T. W. Goldsmith said he could not

help thinking it would be a mistake to make any difference between the subscriptions or entrance fees of town and country members.

Mr. Cole A. Adams said he should certainly oppose the amendment, for the reason that had been stated by Mr. Pratt and Mr. Mountford. A little practical experience in such matters was worth an immense amount of theory.

The Chairman then put the amendment, which was lost by a considerable majority.

A Member, whose name was not announced, then moved as an amendment—"The entrance fee of each member be one guinea."

Mr. Barrell seconded.

The amendment was opposed by Mr. Pratt and Mr. Sirr, and on being put by the Chairman was lost.

Mr. B. Dicksee then moved as an amendment the following :—

"The entrance-fee of each member shall be two guineas, and his annual subscription 25s., which will entitle him to a copy of the Architectural Association 'Sketch-book' without extra subscription."

He said the object of his amendment was to raise extra money, and he estimated that if the subscription to each member, including the "Sketch book," be put at 25s., there would be an excess over the money received under the present system.

Mr. Earle seconded.

Mr. Cole A. Adams said he hoped the amendment would be defeated. The amendment, if carried, would tend to cheapen the "Sketch book" which was a very valuable publication.

The amendment was then put from the chair, and lost by a large majority.

By-law IX., without alteration, was then put and carried.

Mr. Stannus then proposed the adoption of By-law X. :—

"10. A member shall pay his entrance-fee and first annual subscription within two months of the day of his election, otherwise his election shall be void; and he shall be ineligible for re-election during the remainder of the Session."

Mr. H. W. Pratt seconded the motion, which was agreed to.

Mr. Stannus next proposed the adoption of By-law XI. :—

"11. Annual subscriptions shall be paid in advance at the commencement of each Session; but the subscription of any Member elected after the last day of April in any year shall cover the ensuing Session."

Mr. F. R. Farrow seconded the motion.

The Chairman stated that the Committee had resolved, in the event of By-law X being passed, that all the gentlemen nominated on December 12 for election on January 9, should be placed on the same footing as those elected prior to January 1, 1891.

The motion for the adoption of By-law XI. was then put and carried.

The adoption of By-law XII. was then proposed by Mr. Stannus :—

"12. A Member shall be liable for the payment of his annual subscription until he has either ceased to be a Member under By-laws Nos. 13 and 14 or has signified in writing to the Secretaries (by whom it shall be acknowledged) his intention to resign; and has paid all arrears; but the Committee shall have power to reinstate any former Member who has paid all subscriptions due at the time of his resignation, and he shall not be required to pay another entrance-fee."

Mr. Farrow seconded the motion, which, after a verbal alteration, suggested by Mr. H. O. Cresswell, had been agreed to, was carried.

Mr. Stannus then moved the adoption of By-law XIII. :—

"13. A list of Members whose subscriptions are in arrear shall be posted in the premises of the Association. If any Member shall permit his annual subscription to remain in arrear for a period exceeding one Session, his name may be removed from the roll of Members by resolution of the Committee; but the Committee shall have power to reinstate him upon satisfactory explanation and payment of arrears."

Mr. Cole A. Adams seconded the motion.

Mr. F. T. Bagallay said he thought it ought to be stated for how long a period the list should be posted. He moved, as an amendment, the insertion of the words "one session" before the words "in arrears" in the first sentence.

Mr. Goldsmith suggested that the word "and" be inserted after the word "Association" and between the word "if."

The amendments having been seconded and carried, By-law XIII. was carried as amended.

Mr. Stannus then moved the adoption of By-law XIV. :—

"14. If the Committee shall consider that the conduct of any Member has been derogatory to the Association



or his professional character, then they shall have power, after due inquiry, to expel him, provided they shall so decide by a majority of at least two-thirds of those present; and in any case by the vote of not less than eight of those present. If the Committee so decide, then the Chairman at the next General Meeting shall announce such decision, and the Secretaries shall thereupon communicate the fact by registered letter to such Member, and any subscription he may have paid for the current session shall be returned."

This having been seconded, was put to the meeting, and carried.

Mr. Goldsmith suggested that before the next By-law was considered, Rule III. of the Constitution, which had been deferred at the last meeting until the question of the subscription had been dealt with, should be considered.

Mr. Stannus then moved the adoption of Rule III. of the Constitution:—

"The Association shall consist of ordinary members and allied societies."

Mr. Pratt seconded the motion, which was agreed to unanimously.

The adoption of By-law XV. was then proposed by Mr. Stannus:—

15. "The Committee shall consist of the President, two Vice-Presidents, two Secretaries, the Treasurer, the Librarian, ten Ordinary Members, and a representative of each Allied Society who shall be a Member of the Association. Six Members shall form a quorum."

Mr. F. R. Farrow seconded the motion.

Mr. W. J. H. Leverton, moved as an amendment the addition of the words, "No member of the Committee may hold any paid office."

Mr. Cole A. Adams said that the Constitution stated that they should be honorary.

Mr. Leverton said that that did not meet his case. It was proposed to engage somewhat extensively in paid teaching, and it would be part of the duties of the Committee to nominate the teachers and fix their fees.

Mr. Hudson seconded the amendment.

Mr. Stannus opposed the amendment on the ground that the Committee at times found it very difficult to get lecturers or teachers for the classes, and often had to undertake the duties themselves. The proposed amendment would debar them from doing that unless they were to forego an honorarium of a few guineas in aid of the expense of preparing their diagrams,—an honorarium which, as far as his experience went, did not do more than cover one-fourth of the actual outlay to which lecturers were put. Mr. Leverton was mistaken in supposing that these lectureships or teacherships were valuable pieces of patronage.

Mr. Cole A. Adams said he should oppose the amendment, because frequently men who were doing the best and most energetic work of the Association would be on the Committee, and not only that, but they would be teachers, and to a very limited extent, paid teachers in the future.

The amendment was then put and lost.

Mr. Owen Fleming moved as a further amendment the insertion of the word "ordinary" before the words "member of the Association."

This amendment was agreed to, and By-law XV., thus amended, was adopted.

Mr. Stannus then moved the adoption of By-law XVI.:—

"10. The duty of the President shall be to preside at all meetings; and to deliver an address at the annual general meeting."

Mr. Farrow seconded the motion, which was agreed to.

Mr. Stannus next moved the adoption of By-law XVII.:—

"17. A Vice President shall undertake the duties of the President in his absence."

Mr. Pratt seconded the motion, which was carried.

The adoption of By-law XVIII. was then moved by Mr. Stannus:—

"18. In the absence of the President and Vice-Presidents at the time for the commencement of any meeting, the Members present may elect a chairman for that meeting."

Mr. Cresswell seconded the motion, which was agreed to.

Mr. Stannus then moved the adoption of By-law XIX.:—

"19. The Secretaries shall have charge of all the Property of the Association, except the Funds, and the Library. They shall take Minutes of all General and Committee Meetings; and shall, subject to the direction of the Committee, manage the general business of the Association."

Mr. Cresswell seconded the motion, which was carried.

Mr. Stannus moved the adoption of the next By-law as follows:—

"20. The Treasurer shall, subject to the control of the Committee, have the receipt and disbursement of the Funds of the Association; and shall present an audited account at the Annual General Meeting."

Mr. Cole A. Adams seconded, and By-law XX was agreed to.

On the motion of Mr. F. T. Baggallay the meeting was at this point adjourned. There are nineteen other By-laws to consider.

## Illustrations.

### DESIGN FOR A DINING-ROOM.

THIS interior is reproduced from a colored drawing exhibited by the artist, Mr. J. Armstrong Stenhouse, in the Architectural Room of the Royal Academy Exhibition of this year, along with another drawing of a boudoir interior. We drew attention to them at the time as good examples of design of this class. The "strapwork" Elizabethan detail which is introduced is not a form of decoration we have much sympathy with, neither the weak-looking scroll supports to the chair-arms; but the general effect of the apartment is rich and harmonious, and preserves the general character suitable to a dining-room.

### HOUSE, WOLVERHAMPTON.

THIS design was submitted by Messrs. Bell & Roper in a limited competition which was decided in favour of Messrs. Grayson & Ould.

It was proposed to use red brick for the ground-floor walling, with stone dressings; and oak framing with a little hanging tile work above, and tiles for the roof.

The sketch plan sufficiently indicates the general arrangement of the interior, the fittings of which were to be in keeping with the building.

### ELGIN CATHEDRAL.

LIKE St. Andrews, the Cathedral of Elgin has suffered considerably both from fire and the mob. It is still, however, one of the finest ruins in Scotland, and is especially noteworthy for some very delicate details on the west doorway, which retains some of its figure sculpture. We give an elevation and section, with plans of the eastern end of the choir, with its flanking turrets, from drawings by Mr. R. B. Pratt. From what remains, it seems probable that the tracery in the head of the west window was of the same design as the circular one shown in the drawing. The two western towers are fairly perfect, and have some very beautiful detail, although the general effect is severe. In the south aisle are two windows still standing, one of which retains its tracery in almost a perfect condition. Most of the work in the building is of the thirteenth and fourteenth centuries, but there is some earlier work in the south transept. There are remains of a fine octagonal chapter-house on the north side of the choir, connected with the north aisle by a short passage.

### WESLEYAN CHAPEL AND SCHOOLS, WEST KIRBY.

THE Chapel, which is designed to seat 650 adults, is not yet erected.

Its plan is cruciform, with nave and transepts. It has a gallery on three sides, and organ-chamber behind the rostrum, over the vestry. The spire will be 90 ft. high. The estimated cost of this part of the scheme is 3,000*l.*, and the cost of the school portion of the scheme, as now completed, is about 1,050*l.* (exclusive of land).

The buildings consist of an assembly-room, one vestry, and three class-rooms. One of the latter is to be used as an infant-room, and the others are so arranged as to serve as transepts, opening into the assembly-room by means of rolling partitions.

The building material is local sandstone, rock-faced, with dressed stone for the front windows, coping, &c.

There is accommodation provided for 400 scholars.

The whole is designed with a view to its adaptability for purposes of worship until the main building (the chapel) is erected, and on this account the architectural features of the assembly-room have been specially studied. All the windows are glazed with cathedral glass in

quarries and margins, and behind the rostrum there is a traceried circular window filled in with a design.

The architect is Mr. John Wills, of Derby; and the builder is Mr. Wm. Christian, of West Kirby.

### NEW RAILWAY BRIDGES IN INDIA.

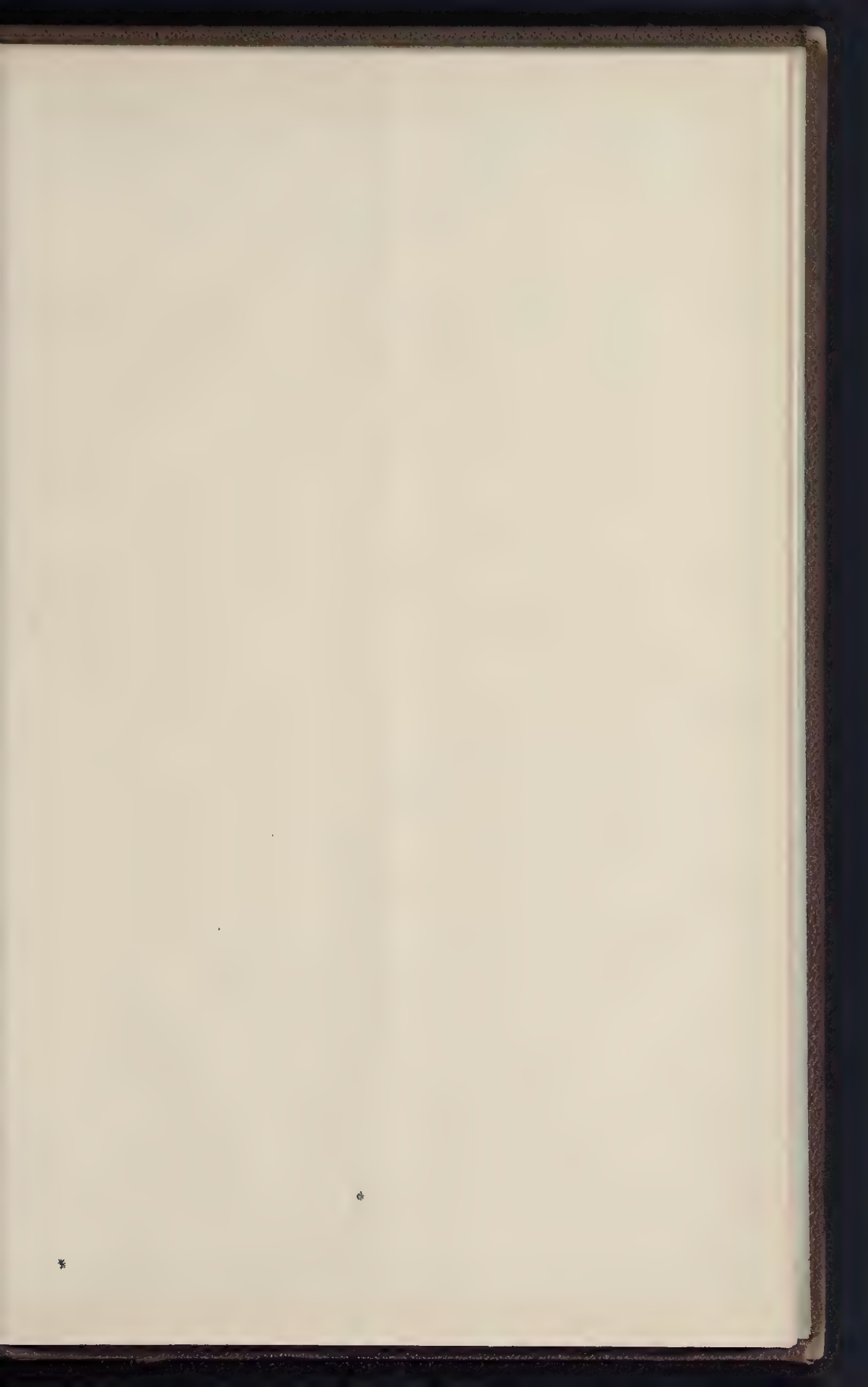
AT a recent meeting of the Institution of Civil Engineers, the President, Sir John Cooke, K.C.M.G., being in the chair, a paper was read on "The Lansdowne Bridge over the Indus at Sukkur," by Mr. F. E. Robertson, M.Inst. C.E.

At Sukkur, where the North-Western State Railway had been carried across the Indus, the river passed through an isolated ridge of nummulitic limestone, and was divided into two channels. The Sukkur Pass was bridged by three spans of 275 ft., 238 ft. and 94½ ft. respectively, while the Rori Channel was crossed in a single span of 820 ft. The steel superstructure of the last-named span was designed by Sir A. M. Rendel, K.C.I.E., and consisted of a pair of cantilevers each having a projection of 310 ft., carrying between them a central girder 200 ft. in length. The paper was principally a description of the methods employed in the erection of this span. Each cantilever had a vertical height of 170 ft. above the abutment, and at this point the principal members consisted of a vertical pillar and an inclined strut or jib, united at the top by a horizontal tie, and tied back by an inclined land-tie or backstay anchored into the rock. When the anchorage had been bedded, the inclined guy and the vertical pillar were erected by means of temporary staging, and were permanently connected at the top. The inclined strut, which was 230 ft. in length, was then built up from the abutment, being laid in its inclined position on staging at the lower end, and further supported, as it progressed, by temporary wire-ropes from the permanent horizontal tie between the tops of the pillar and the strut, a temporary wire-rope suspension-bridge was thrown across the space of 123 ft. between their summits. This bridge carried a gantry, on which ran the travellers employed in erecting the steelwork of the horizontal tie. The cantilevers on each side of the river having thus been pushed forward with an over-reach of 123 ft., a system of running overhead rope-gear was fitted up, spanning the intervening gap and serving for the erection of the remaining members of each cantilever piece by piece. The ropes were worked from the summit of each cantilever by winches which were driven by a steam-engine on land by means of a running rope. When the cantilevers had thus been carried out to their full length, the central girder was erected upon a temporary inverted bowstring, which was slung across the opening with the aid of the overhead gear.

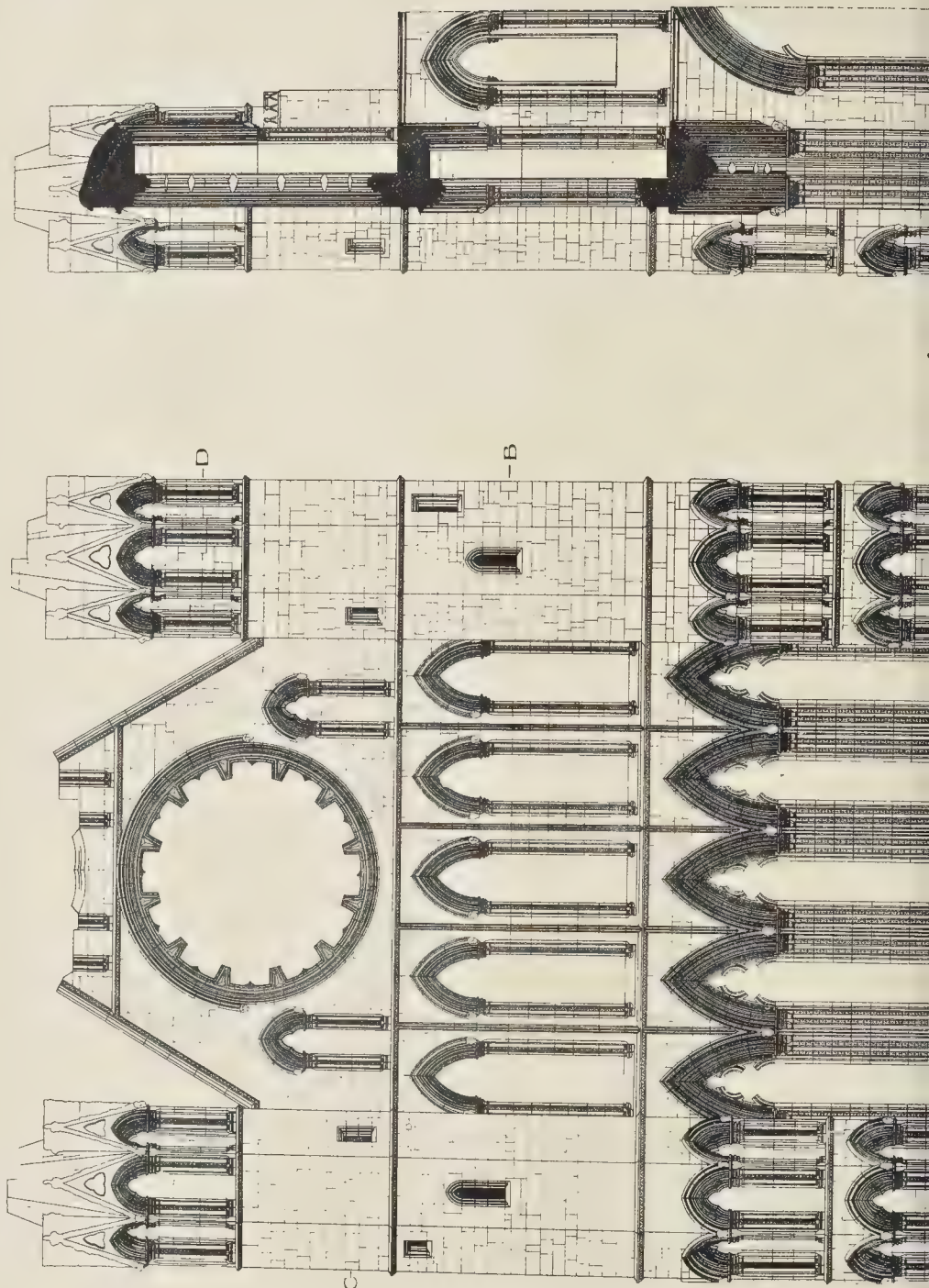
At a subsequent meeting of the Institution, the account of "The New Chittravati Bridge, Madras Railway," by Mr. Ed. W. Stoney, M.Inst. C.E., was read.

The main line of the Madras Railway was originally carried across the Chittravati River upon a plate-girder bridge, consisting of forty spans of 70 ft. each. This bridge was opened for traffic in 1868, and was partially destroyed by a great flood in October, 1874, when nine of the piers were undermined and overthrown. It was afterwards repaired, and the damaged piers having been replaced by screw-piles, the structure had served for some years to carry the traffic, but was now replaced by the bridge which formed the subject of this paper. The new bridge had a total length of 2,680 ft., consisting of nineteen spans of 140 ft. from centre to centre of the piers. It crossed the river alongside the old bridge, but more nearly at right angles to the stream, the approaches being formed by a railway diversion 1½ mile in length. The source of the river was 80 miles above the bridge, and in that distance it drained an area of 2,400 square miles. In the flood of 1874 its velocity was calculated to have been 8½ ft. per second, and the discharge 114,625 cubic ft. per second. As a rule the bed of the river was practically dry for nine months in the year, and taking advantage of this fact, the dry bed of the stream was made use of for the transport of materials, for the erection of the ironwork, and for the operations connected with the sinking of the pier cylinders and the well-foundations of the abutments. The foundations were carried down to the solid rock at a depth varying from

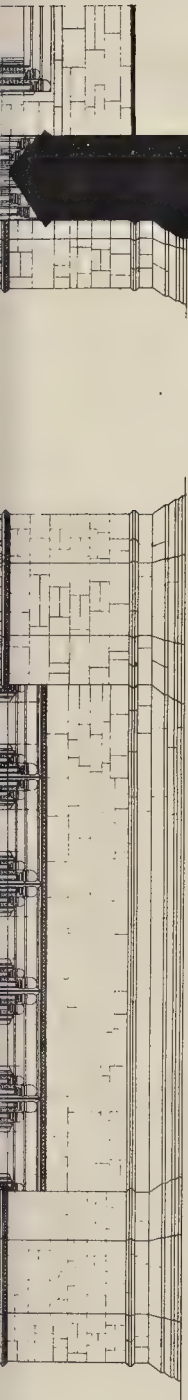




THE BUILDER, DECEMBER 27, 1890.





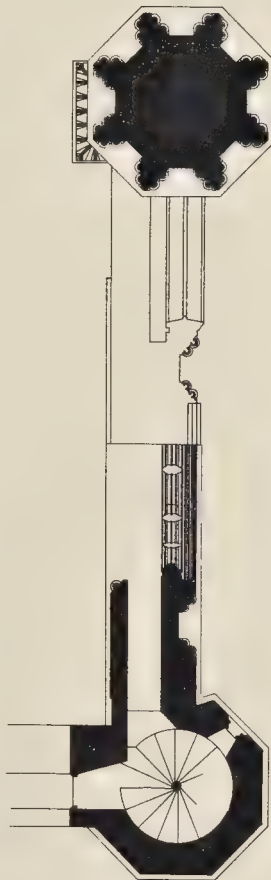


Section.



Plan at A

Plan at B



Plan at C

Plan at D



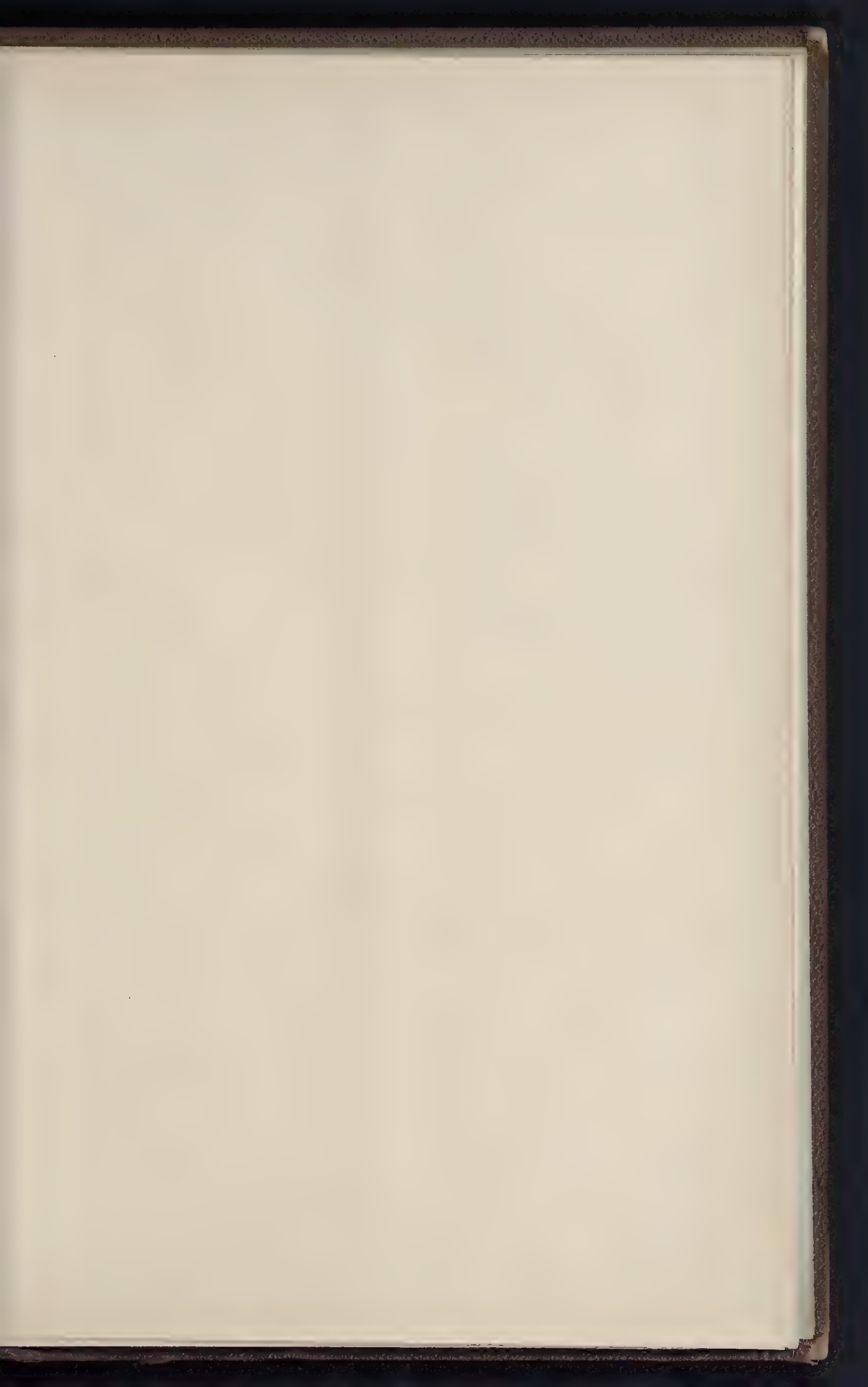
*Robert B. Pratt.*  
*May 24, 1887-88.*

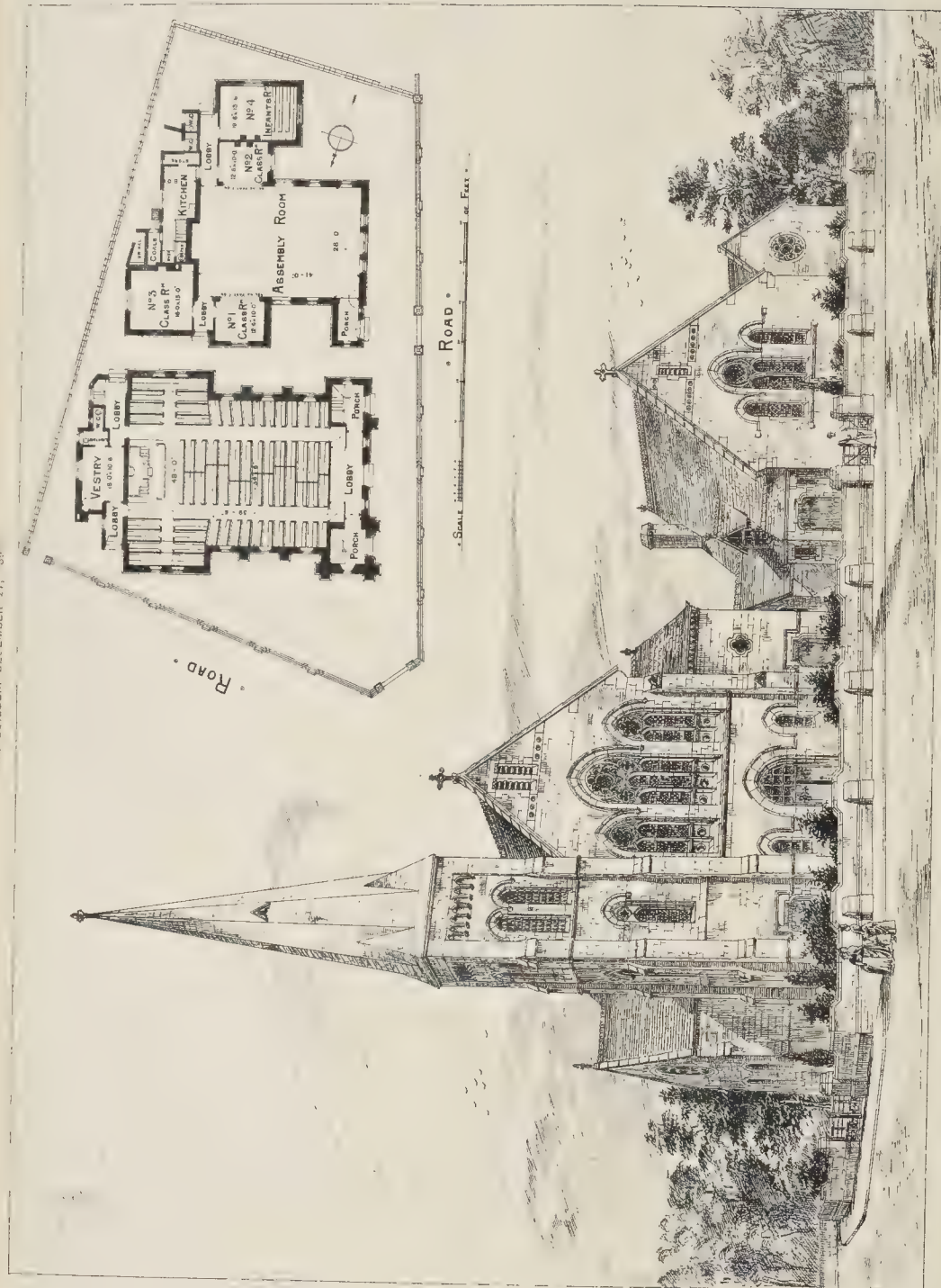
PHOTO LITHO SPRAGUE & CO. 22, MARTINE LANE, CANON ST., OXFORD, E.C.

ELGIN CATHEDRAL: MEASURED DRAWINGS.—By Mr. R. B. PRATT.





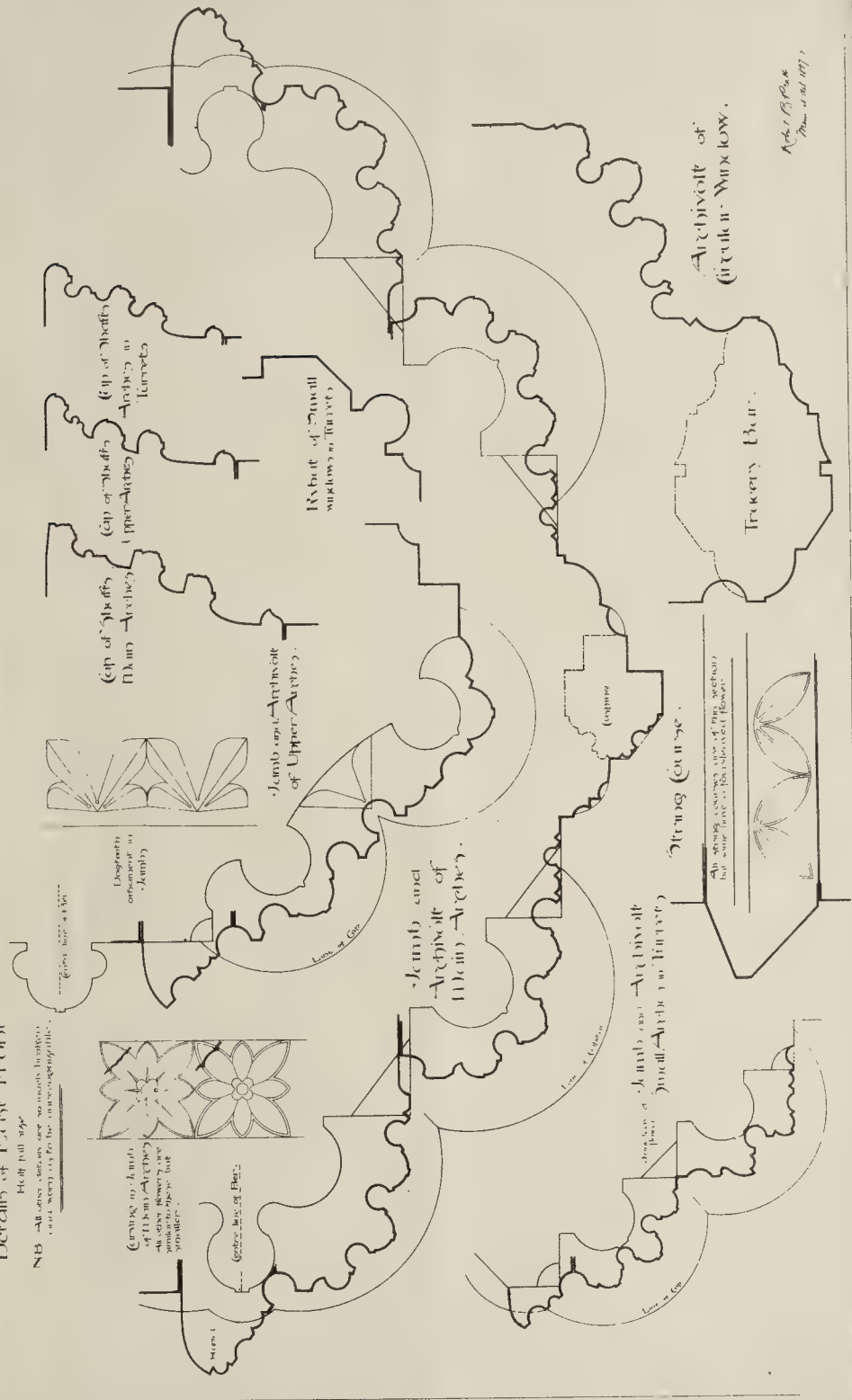






# ELGIN CATHEDRAL. Details of East Front.

Height full size.  
NB All lines drawn on exactly half-size, and reduced to full size in perspective.

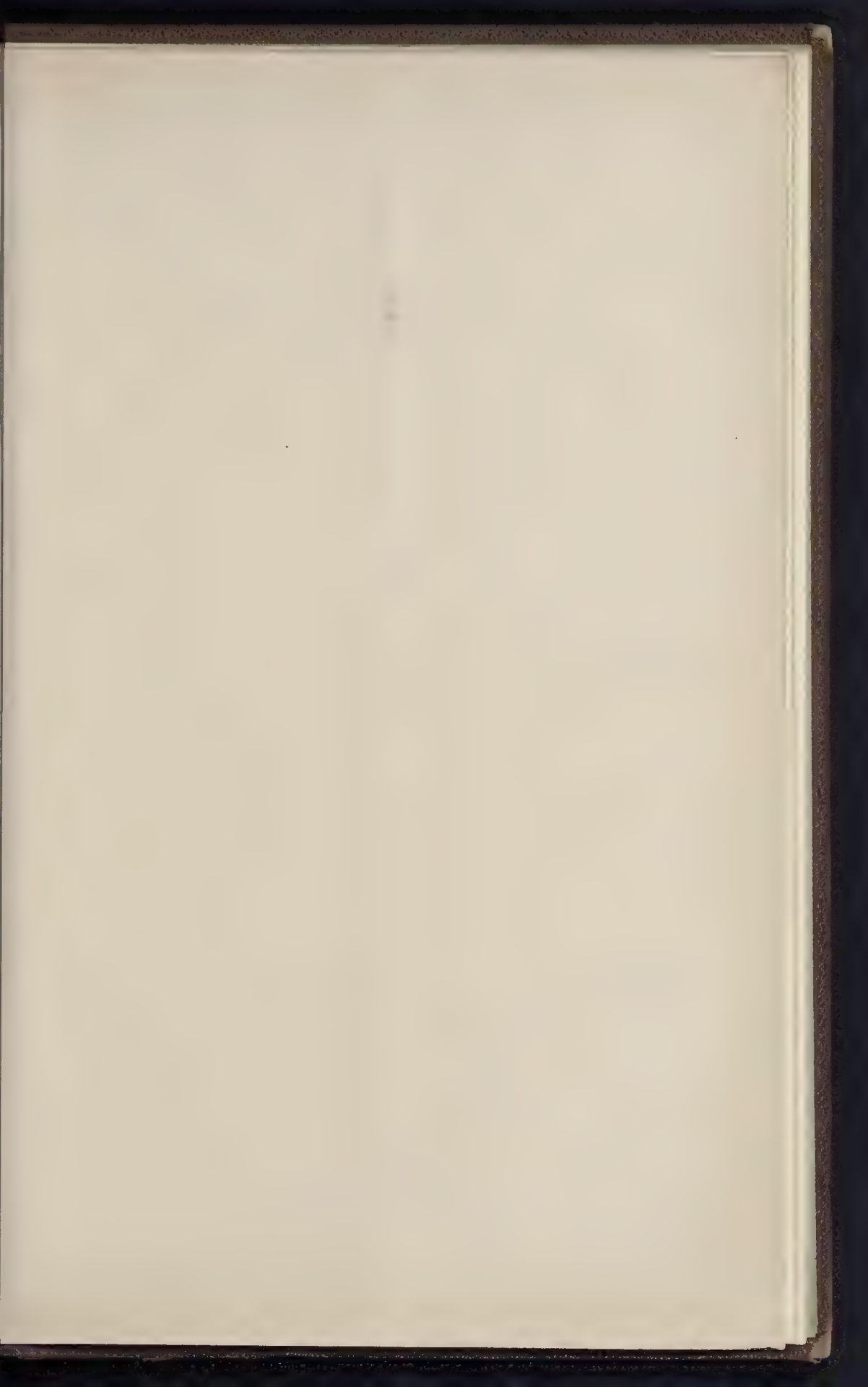


ELGIN CATHEDRAL: MEASURED DRAWINGS.—By Mr. K. B. PRATT

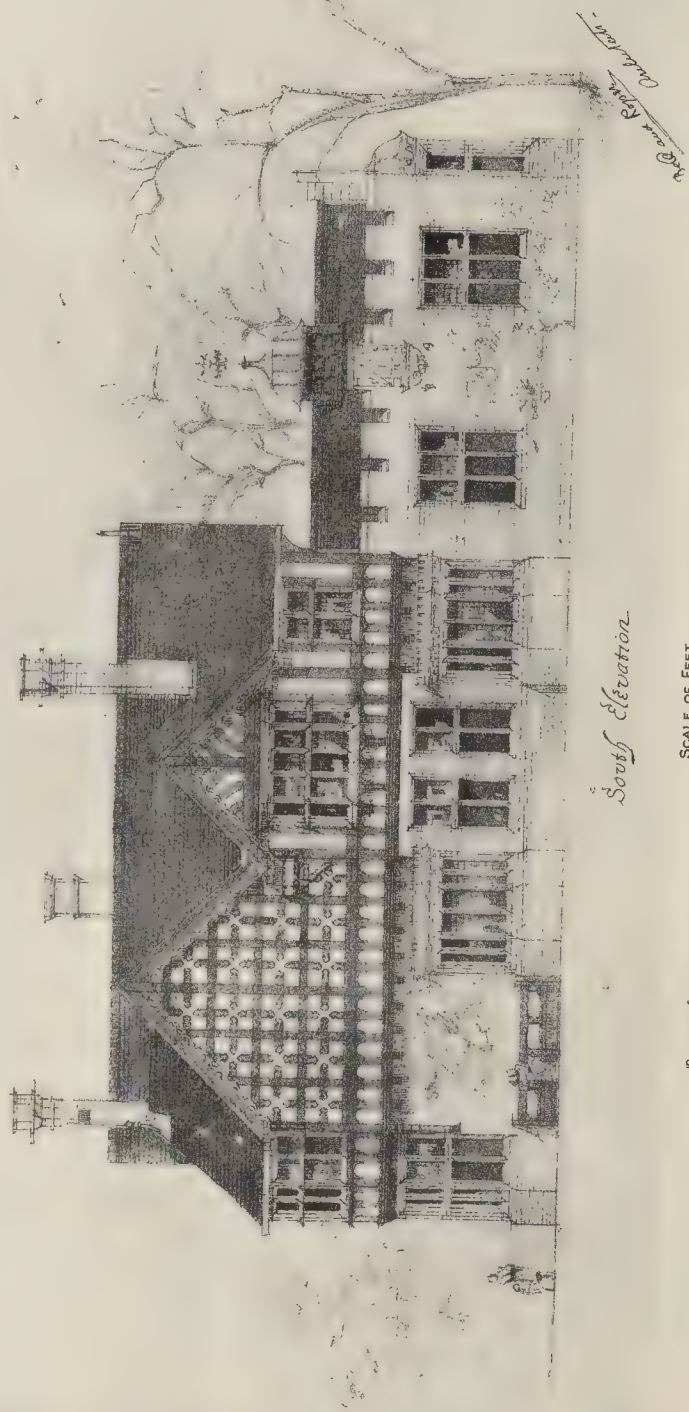
Arch. B. Pratt  
June 1887







*Sketch for proposed House*    *Wolverhampton.*  
*S. Geo. Mander Esq.*  
*Messrs. Bell & Roper Architects.*

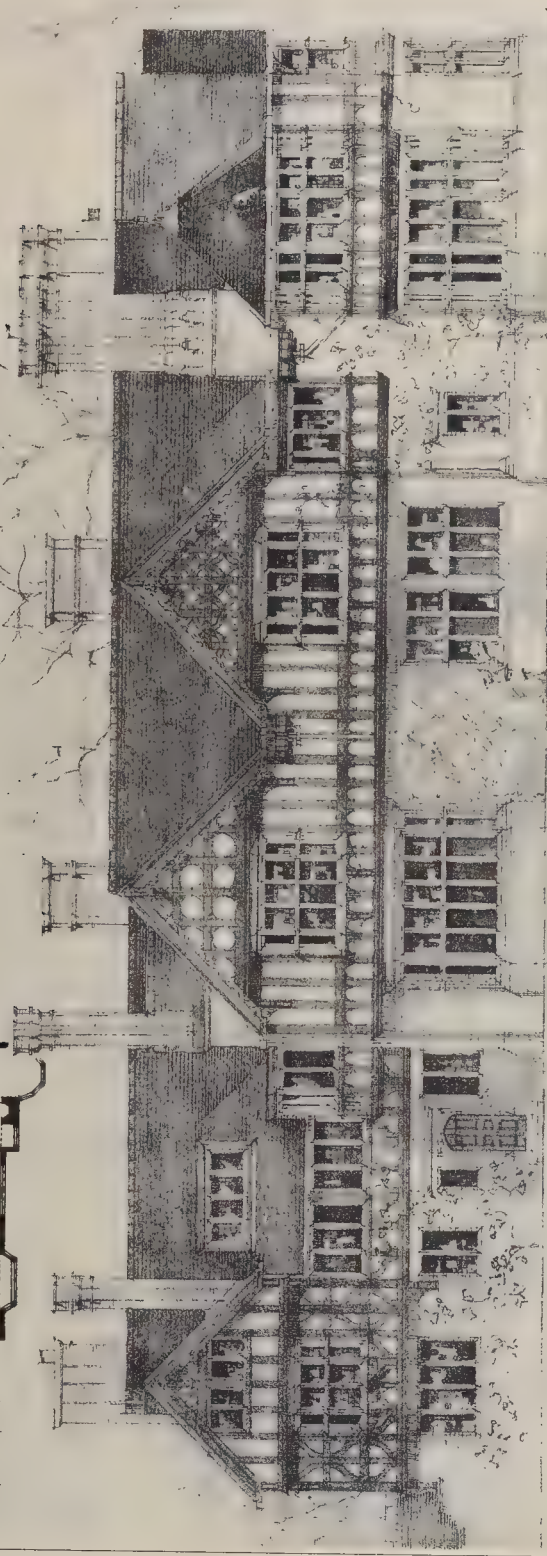


*Ground plan*



See plan of

Messrs Bell & Roper Architects



See plan of Roper

Elevation of the West front. facing the garden.

See plan of Roper





18 ft. to 80 ft. below the present bed, the overlying strata consisting of sand, gravel, and clay, and in some places of a deep bed of large trap boulders. The cylinders were sunk by various processes, according to the nature of the ground, the greater part of the work being done by dredging, while some cylinders were partly excavated in the dry with the aid of pulso-meter pumps, and in others the work was carried on by divers or by pneumatic apparatus. The superstructure was designed for a single line, the girders being of the Murphy-Whipple type. The ironwork of each span was erected, during the dry season, upon camber-blocks laid upon the dry bed of the river, and was lifted into place by 60-ton hydraulic jacks applied under the end pillars of each girder. The weight of each span was 146 tons 12 cwt.

#### VIBRATION OF RAILWAY TRAINS:

##### THE INSTITUTION OF CIVIL ENGINEERS.

At a recent ordinary meeting of this Institution, Sir John Coode, K.C.M.G., President, in the chair, a paper was read on the "Vibratory Movements of Locomotives, and on Timing Trains and Testing Railway Tracks," by John Milne, F.R.S., and John McDonald. This was an account of certain instruments which had been designed to register the oscillations and vibrations of trains, so as to give an automatic record of the run, and information as to the condition of the track. These instruments were modified forms of seismographs, the ordinary earthquake instruments being affected so much by the suddenness of the jolts, and by changes in inclination, as to be unsuitable for this purpose.

The apparatus for recording vertical movements consisted of a clock-spring coiled upon an axle, and connected with a lever carrying a weight in such a way that when the spring was wound the weight was supported by it. The result of this combination was, that for up and down movements of the apparatus some point in the weight remained at rest, and the relative motion of the apparatus and the weight was recorded by means of a pointer attached to the lever.

Horizontal vibrations were registered by the movement of pointers attached to two pendulums, the planes of motion of which were at right-angles to each other. The simplest form of pendulum was a metallic cylinder, free to swing on pivots placed on its upper edge. The oscillations of the pendulum might be controlled by giving a certain frictional resistance to the movements of the pointers, as, for instance, by increasing the pressure upon the writing point. Another method of making the vibrations of the pendulum dead-beat, by coupling together two pendulums with a sliding joint, was also shown.

The recording-surface might be a drum, covered with metallic or ordinary paper and driven by clockwork, the pointers being strips of metal pencils, or pens; and to obtain a record extending over a considerable period a long band of paper rolled on a drum, as in the Gray-Milne seismograph, was pulled over another drum and wound up on a third, driven by its own system of clockwork.

Reference was made to fifty-eight locomotives now in Japan, on which experiments were carried out. In England, diagrams had been taken in carriages running on the London and North-Western, the Caledonian, the Great Northern, the South Eastern, and the Metropolitan Railways; and in America a diagram, the original of which was exhibited, was taken, showing the motion of a carriage between New York and San Francisco, a distance of about 3,300 miles.

As the diagrams produced by the vibration-recorder were evidently connected with the balancing of the engines, details of the weights of reciprocating parts and the balance-weights were given, together with the equivalent balance-weight, which was determined experimentally in the following manner:—A pair of wheels, with their balance-weights and crank-pins, were placed on the rails; a large round steel ring was then hung from the crank-pin, and from this weights were suspended until a balance was obtained. This weight hung upon the crank-pin was called the equivalent balance-weight, and it was found that when this weight was nearly equal to that of the reciprocating parts—that was to say, when the horizontal

component of the energy due to the reciprocating parts was balanced—the diagrams for longitudinal motion were small.

Most of the diagrams were taken on locomotives running on the line between Tokyo and Yokohama, a distance of 17½ miles, and they showed that there was a relationship between the character of the line and the recorded movements. Soft ground could be distinguished from hard ground, and the effects of bridges and culverts were recorded, all diagrams on the same line showing the same characteristics.

As an illustration of the use of the instrument, two diagrams were shown, taken on different engines running over the line from Shinbashi to Yokohama, the paper moving at the rate of 1 in. to the minute. It was pointed out that as Shinagawa was approached the diagram became larger. This was explained by the fact that this portion of the track rested on the mud of Tokyo Bay, and was, therefore, soft and yielding. At the third minute after starting a sudden movement of the pointer occurred as the engine passed one of the culverts, but the cause of this jerk had not been determined. The train was seen to have left Shinagawa two minutes late, and to have stopped at Omori a minute and a half, instead of one minute, the schedule time. Between Omori and Kawasaki there were irregularities indicating soft places, but the most important mark occurred in the second span of the 40 ft. girders forming the water-way leading up to the large bridge at Kawasaki. This mark was found regularly in all the diagrams, and a staff of workmen who knew nothing of the experiments having been sent to examine the place, reported that a sleeper on the second span of the down track yielded, when a train passed, twice as much as any of the other sleepers. Between Tsurumi and Kanagawa the diagram was rather larger, indicating a soft place that required attention. Yokohama was reached four minutes late, the places where time was lost being easily determined upon a close examination of the diagram.

The record of longitudinal motion was found to show most clearly differences in balancing, the size of the diagrams upon engines which differed only in the balancing having been as 6 to 27. A striking feature in the diagram of longitudinal motion was that it indicated ascents and descents by deviating to the right and left of a median line. Curves were marked in a similar manner by the portion of the instrument recording transverse motion.

The observation that certain locomotives gave a larger longitudinal diagram than others suggested that such engines were not exerting their power in an economical manner. It was found that the engines which had used the least coal per mile were those in which the difference between the weight of the reciprocating parts and the equivalent-balance was small; and, on the contrary, in those engines where the difference was large the consumption of coal and oil was considerably greater. It occurred to the authors that engines yielding different diagrams might show a difference in the wear of their tires. The data obtainable were meagre, but they appeared to indicate that those engines which gave a small diagram for longitudinal motion did not wear out their tires so quickly as others.

The conclusions arrived at by the authors were:—1. The vibration-recorder might be of value to those who had to deal with the management of the traffic, inasmuch as it furnished details of the times of stoppage and the speed at any part of the run. 2. The instrument might be used by those who had to inspect lines. Variations due to carelessness on the part of the platelayers were recorded. Curves, ascents, and descents, and even slight variations in grading, were indicated; faults in sleepers, irregular yieldings on bridges, soft portions of the track, and other imperfections were definitely marked; and changes in the permanent way could be at once detected if such diagrams were taken at intervals. 3. The vibration-recorder might furnish information of value with regard to the manner in which a locomotive should be balanced, the vibrations due to this cause being measured by the diagrams for longitudinal and vertical motion. For this purpose, diagrams might be taken on a surface running at the rate of 1 in. per second. In this case each vibration of the locomotive was recorded separately, and from these diagrams the maximum acceleration of each backward and forward motion had been calculated.

#### CRYSTAL PALACE SCHOOL OF ENGINEERING.

THE certificates gained by the students of the Crystal Palace School of Practical Engineering during the past term were presented on Saturday afternoon, in the lecture-room of the school, South Tower, by Major F. A. Marindin, R.E. (Government Inspector of Railways). The report of the Examiners was read by Mr. F. K. J. Shenton.

Mr. C. R. Hanson, who examined the students in the Mechanical Engineering Department, reported that of the fifty students who attended the lectures, thirty-eight were eligible for examination, and of these twenty-two satisfactorily passed. The practical training which the students received in the School could not fail to be of use to them in after life, whether or not they continued to practise the profession they were now training for. He was much struck by the excellent work that had been done during the term by many of the students in the workshops.

Mr. W. T. Douglass, who conducted the examination in the Civil Engineering Department, in his report said the regularity and efficiency of the teaching and the distinction gained by the students were entirely satisfactory. Good work continued to be done, and a high reputation was gained by the students in the various branches of the profession for which they were prepared in the school. It appeared that the School was advancing in numbers, and, as in past terms, had been distinguished not more by the ability and energy of the teachers than by the great earnestness of the students.

Major Marindin, in addressing the students, asked those who had won awards to remember that all the prizes and all the certificates in the world would not ensure success in their profession unless they worked hard at their studies for years to come. Those who had not gained certificates he hoped would not be discouraged, but would go on trying, always remembering that many men who had failed in their examinations in their youth had shown by subsequent achievements that examinations were not the only test of a man's ability. He had had an opportunity of inspecting the School, and had been struck not only with the excellent models and other practical work, but with the drawings in the civil engineering section, which were quite up to anything he had ever seen in an engineering school. Another thing that struck him while making his inspection was the great advantages the present generation enjoyed in schools of this kind compared to those possessed by men like Stephenson. All the more credit was, of course, due to men who had come to the front entirely by their own exertions, but it was satisfactory to think that the advance that had taken place in the means of obtaining scientific education had borne good fruit. Looking at the great engineering works of late years, such as the St. Gotthard Tunnel, the Forth Bridge, the Eiffel Tower, and the Severn Tunnel, which was, in itself, a monument of difficulties overcome, we had good reason to be satisfied with the results. No doubt in other scientific professions there had been great progress, but it was satisfactory to know that their own profession had advanced so much. With regard to railway engineering, with which he was more intimately acquainted, he wished to say that a railway engineer, in the first place, must be a good surveyor. He should also have an intimate scientific knowledge of all classes of building materials, especially iron and steel, and a knowledge of mechanics was essential. There was yet another quality they should possess, and that was that they ought to be leaders of men. This was important, because, however skilful they might be, and although having every scientific appliance at their command, there would always remain that one weak link in the chain, viz. human fallibility. Those who controlled the railways now pretty generally recognised this, and the result was that there did not, he believed, exist in the kingdom a body of men more intelligent, more able, more steady and respectable, taking them all round, than the servants of the railway companies of Great Britain. Probably some of them believed that railway engineering must soon come to an end in this country, and that the profession was getting overcrowded. Those who did entertain that idea had plenty of other fields open to them. Electricity, for instance, —that infant science the future of which no one could foretell, and the importance of which it



was almost impossible to exaggerate,—opened a wide field for the engineer. Another matter to which they could turn their attention was that of how to deal with the smoke of our large towns, and anyone who was so fortunate as to solve that problem would earn the gratitude of everyone, and deserve a monument. All things considered, he did not think that the profession, even in this country, would have to pine for fresh worlds to conquer.

The certificates were then distributed in the following order:—

*Mechanical Engineering Lecture Examination.*—R. F. Hull, W. Beer, A. H. Daniel, A. S. Harbord, J. F. J. Reynolds, H. C. Rose, H. F. Key, W. L. Wilson, A. J. Hobman, G. J. G. Jensen, F. W. Loxton, C. N. Spencer, A. F. Baynham, T. F. Fitt, W. L. Wynn, G. H. Powell, P. D. Nichol, G. H. Laidman, L. C. H. Savory, S. T. Edge, H. T. Jackman, F. H. M. Maynard.

*Drawing Office.*—C. N. Spencer, R. Beeching, A. J. Hobman, W. Margittis, A. W. Previtte, T. F. Fitt, P. F. Michod, H. E. Bromage, and H. C. Adams.

*Pattern Shop.*—A. S. Harbord, W. L. Wynn, A. F. Baynham, L. C. H. Savory, J. E. Campbell, A. D. Allport, R. Roberts, H. T. Jackman, G. H. E. Cooke, R. T. Goodman, T. J. Freme, and J. R. E. Davy.

*Fitting Shop.*—H. C. Rose, W. L. Wilson, W. Beer, S. T. Edge, A. F. Franks, H. F. Key, J. F. J. Reynolds, A. H. Daniel, F. R. Hull, A. Patch, F. W. Loxton, C. L. Curtis, F. H. M. Maynard, G. H. Powell, F. H. Kruse, F. W. Dolman, and L. N. G. Knapp.

*Civil Engineering Section.*—First term: F. D. Maw, W. H. Sadler, G. H. Laidman, T. Nitta, A. J. Kenward, C. J. Walker, E. E. M. Hett, H. A. Scott, H. Abrahamson, P. T. W. Fletcher, R. W. Mandlaw, and H. K. Forbes. Second term: H. E. Heald, J. W. Revy, C. W. Spencer, W. J. Watson, A. Woodhill, J. R. Macdonald, G. F. Moorhead, B. M. E. Nicholls, and S. E. R. Cooke. Third term: W. E. Brewerton, A. Matthews, F. W. Wheldon, F. D. Workman, A. H. Roberts, G. R. S. Kirkpatrick, E. V. J. Acton, S. C. Harrold, D. A. Aerial, W. E. Sahn, H. R. Russell, and E. L. Russell. Fourth term: W. G. Wales, H. W. Bathurst, and A. H. Alston. Electrical Section: C. B. Clay and E. S. Eccles.

The chief honour was awarded to Mr. W. G. Wales, who received a bronze medal for having, during his course through the school, obtained the necessary nine certificates, none of which were below third in order of merit. It should be mentioned that only eight of these honours have been awarded in the eighteen years of the School's existence.

Mr. J. W. Wilson, Principal of the School, and other gentlemen, addressed the students in the course of the proceedings, and votes of thanks were accorded to the Examiners and to the Chairman.

#### ARCHITECTURAL SOCIETIES.

**THE ROYAL INSTITUTE OF THE ARCHITECTS OF IRELAND.** The annual general meeting of this Institute was held on the 13th inst., at 37, Dawson-street, Dublin, Mr. Thomas Drew, R.H.A., President, in the chair. Amongst those present were—*Fellows*—Sir Thomas Deane, G. C. Ashlin, W. H. Byrne, J. R. Carroll, C. Geoghegan, R. C. Millar, W. M. Mitchell, A. E. Murray, J. J. O'Callaghan, W. Strirling. *Members*—T. M. Deane, J. Freeman, J. Holloway, W. Kaye Parry, J. H. Pentland, W. J. Symes. The hon. secretary read telegrams and letters of apology for non-attendance from Messrs. S. Symes, W. H. Beardswood, W. Gillespie, and J. L. Robinson, Dublin; also from W. C. Cox, Limerick; J. H. Fullerton, Armagh; R. Watt, Belfast, and P. J. Lynch, Carlrow. The first business brought before the meeting was the election of Council and officers for the ensuing session. The result of the ballot for these was subsequently announced by the scrutineers, Messrs. W. J. Symes and W. M. Mitchell, as follows:—President, Mr. Thomas Drew; Hon. Sec. and Treasurer, Albert E. Murray; Members of Council, Messrs. J. J. O'Callaghan, S. Symes, J. R. Carroll, Sir T. N. Deane, G. C. Ashlin, J. H. Pentland, C. Geoghegan, R. C. Millar, W. M. Mitchell, J. L. Robinson; Auditors, T. M. Deane, W. H. Byrne. Mr. John Charles Wilmot, Dublin, was proposed by the President as member, seconded by Mr. A. E. Murray, and admitted.—The Hon. Secretary and Treasurer, Mr. Albert E. Murray, then read the report of the Council and the Treasurer's report for the past year.—The adoption of the report was proposed by Mr. J. Rawson Carroll, seconded by Sir Thomas Deane, and agreed to.—The President asked if there were any observations to be made regarding the Dublin Corporation Bill, and also the Architects' and Engineers' Bill, allowed to in the report just read.—Sir Thomas Deane gave his views regarding the advantages of a University degree. The subject had been warmly taken up some time since, in bringing it before Trinity College; but, so far as the matter went at the time, fell through for want of support.—After some discussion, it

was proposed by Mr. J. H. Pentland, seconded by Mr. W. K. Parry, and carried:—"That a sub-committee, consisting of the President, Secretary, Sir Thomas Deane, G. C. Ashlin, J. H. Pentland, and W. Kaye Parry, be appointed to report to the Council on the question of the establishment of a University of Architecture, as proposed in Mr. Arthur Hill's letter of the 5th of September to the Hon. Secretary."—Considerable discussion took place on the subject of the proposed new form of building contract, when it was ultimately agreed that, as a committee of the Royal Institute of British Architects was at present sitting on the question, no further steps should be taken until the views of that body had been ascertained, it being desirable that all contracts should be as uniform as possible.—The proceedings then terminated.—The annual dinner of the Royal Institute was afterwards held at the Grosvenor Hotel, Westland-row.

**LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.**—On the 18th inst., in the Corporation Art Gallery, Leeds, Mr. Wyke Bayliss, F.R.S.A., gave a lecture, entitled "At the Cathedral Door." Mr. Bayliss said that he who would fully see the splendour of a cathedral church must first learn to use his eyes; and he who visited a cathedral church without some knowledge of art saw indeed, but knew not what he saw. A cathedral was an art-education in itself. Westminster, Canterbury, York, Durham, and Winchester were not only churches for theologians,—they were, in their subtle forms and finely-balanced proportions, schools of art which none of them could afford to disregard. In the course of his remarks, Mr. Bayliss gave a description of the different effects produced upon the visitor of the Cathedral of St. Peter's at Rome and the Cathedral at Milan. The construction of St. Peter's, he said, consisted of four great single arches, formed by the intersection of the transept. Upon them rested a circle binding them together, and in its turn upholding the vaulted dome. Nothing was hidden; everything could be understood; it was in art what a perfectly lucid sentence was in rhetoric,—it carried the mind by storm. But Milan,—how different was the spell with which it affected the visitor. There they saw line upon line, arch over arch, vault over vault, in infinite complexity of form. How it came about one did not ask. Its effect was like that of the hidden music which would steal through its dark aisles, its source unseen. St. Peter's held one by the power of the intellect,—its spell was on the brain; Milan held by the power of the imagination,—its spell was upon the heart. In the course of his lecture, Mr. Bayliss sketched in chalk a number of illustrations of the different styles of ornamentation of columns and arches, and explained how the growth of beauty had gradually taken place. A hearty vote of thanks to the lecturer was accorded at the close.

**GLASGOW INSTITUTE OF ARCHITECTS.**—At a general meeting of this Institute recently, the conditions of competition for designs for workmen's dwellings in High-street were again considered, when it was unanimously agreed to record regret that, after having been waited on by a deputation from the Institute, the Improvement Trustees had not seen their way to amend the conditions of competition to meet the views of the Institute as expressed by the deputation.

**GLASGOW ARCHITECTURAL ASSOCIATION.**—Mr. Francis H. Newbery, head-master of the Glasgow School of Art, gave a lecture before this Association on the 16th inst., on "Impressionism in Architecture." The President (Mr. William F. Anderson) occupied the chair. Impressionism in architecture, the lecturer defined to be the imitation of a suggestion from nature, and his object was to prove the need of cultivating this spirit if architecture is to regain her first vitality. As accepted by painting and sculpture, the result is seen in their having attained positions not originally theirs. This theory he illustrated by an allegory, in which a queen and her attendants, twin sisters, have perpetual youth ensured by talismans given by the good fairy. The queen loses hers, and so wanes in beauty, and in process of time the image of the court is transferred to her erstwhile attendant. This talisman of Dame Nature Architecture has well-nigh lost, and appears to rest content with self-admiration of her long past golden age. Sculpture and painting, on the other hand, overstepping precedent when it became irksome, have again and again had recourse to nature,

and so preserved vitality. This contention the lecturer illustrated by instancing the several historical schools. He was not to be supposed as indifferent to the glories of classic art while deifying classic tradition. Of modern instances of a right impressionism, veritable revivals of first principles, Waterhouse's Natural History Museum in London and "Greek" Thomson in Glasgow were cited.

#### ARCHÆOLOGICAL SOCIETIES.

**NEWCASTLE ANTIQUARIES SOCIETY.**—On the 17th inst. a meeting of this society was held in the Castle, Newcastle. Dr. Bruce presided. The secretary (Mr. Robt. Blair) read correspondence on the subject of the proposed removal of the Chancery Records of Durham from London to Durham. After a short discussion it was agreed to allow the matter to drop. Mr. Boyle read "Notes on Dr. Hunter's copy of Bourne's 'History of Newcastle,' with a catalogue of its manuscript contents." Mr. Bates (the High Sheriff of Northumberland) read a paper on "Additional evidence of church dedications in Northumberland." The business then concluded.

**GLASGOW ARCHÆOLOGICAL SOCIETY.**—The monthly meeting of the Glasgow Archæological Society was held on the 18th inst. Mr. Honeyman, the President, read a paper on "Recent Alterations in the Choir of Glasgow Cathedral, and Notes on the Post-Reformation Chancel Arrangements." About seven months ago, he said, operations were commenced in the Cathedral with the view of improving the arrangements for the congregation, and it was thought desirable to have a record of what was found in the course of the operations and what was done. When alterations were made forty years ago no record was kept. On the present occasion the old pulpit was removed, and the enclosure round about it was cleared away. The floor was opened up to the extent of about 600 superficial feet. The lecturer also mentioned that at the west end of the choir there was a brick sarcophagus, which had evidently been put there during former alterations. It was evident, he said, that the builders of this nineteenth century kist had made a mistake in the measurement, as the lid was a foot longer than the kist. He pointed out that these facts indicated that there had been great carelessness in looking after the work, and that the workmen had evidently been left to do what they liked. In regard to the alterations recently made, the lecturer dealt with them at length. They had covered the whole of the area with a marble floor, which, in order not to overload the arches below, was carried on dwarf walls. He also mentioned the marbles which were used as coming from Ireland, Italy, Portugal, and Africa. These had been placed there by Messrs. Galbraith & Winton, a member of which firm, Mr. Gilliland, had given the whole in memory of his father and grandfather, who were buried in the adjoining ground. Mr. Wm. Jolly afterwards read a paper on "Some Notes on the Antonine Wall."

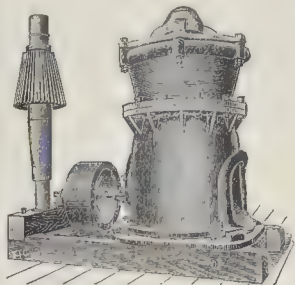
**THE AMERICAN FORESTS.**—According to an official report on the consumption of forest supplies by American railways, about 73,000,000 cross-ties are annually needed for new construction and renewals by the roads of the United States, which is equivalent to about 365,600,000 cubic feet of raw material. The various woods are estimated to be used in about the following proportions:—Oak, 45,000,000; pine, 12,500,000; red, white, and California cedar, 5,000,000; chestnut, 3,500,000; redwood, 2,500,000; hemlock and tamarack, 2,500,000; cypress, 1,500,000; other kinds, 500,000 cubic feet. Thus oak furnishes about 60 per cent. of the supply, and not only from choice trees mainly, but from the young growth, which may make one tie to the tree or one to the cut. For bridge and trestle work, 100,000,000 cubic ft. of sawn material may be added to the requirement, so that a total of 500,000,000 cubic feet of wood in the shape of round timber for railway purposes seems to be a reasonable estimate of the annual consumption. This involves the selection of the best timber from probably more than 1,000,000 acres of natural forest lands, and it is calculated that not less than from 10,000,000 to 15,000,000 acres of well-managed forest would be required to furnish this quantity continually, or, with the present absence of management, the area to be reserved for the purpose would have to exceed 50,000,000 acres, or more than 10 per cent. of the present forest area of the country. The report furnishes a powerful argument in favour of the advocates of the universal adoption of metal sleepers for the railways of the United States.—*Iron.*



## THE GATES ORE BREAKER.

The principle of this machine may be described as that of a vertical, tapered, and fluted head gyrating in a cylindrical hopper. The top of the spindle forming part of the head is *centred*. The lower end is *ex-centred*, producing when in operation an agitating motion. The continuous gyrating of the solid convex head against the quartz, between it and the concave lining, insures the breakage of the material into uniform cubes.

Whatever the obstinacy of the material may be, the head adjusts itself to the required speed.



The machine is claimed to be a great improvement on the flat jaw breaker, where an immense strain is thrown upon the buildings. The machine can be driven either by steam or hand-power. We saw the machine tested with a sample of obstinate gold quartz. Irregular shaped blocks, about 3 in. cubes, weighing 2 lb. were put through and crushed to the size of one-eighth to three-eighths of an inch in the space of seven seconds. Two other different samples were crushed in proportionate time.

The larger sized machines, of which there are eight varieties, are used for preparing macadam, concrete, granite work, &c. One crusher is said to have a capacity equalling 150 tons per hour; the cost being computed at less than 1d. per ton. These produce a uniform size of about 12 in. cubes. By returning the material from a large machine to a small one, it is brought almost to the fineness of Thames sand.

The machines can be fed from the tip-cart right into a hopper-head on a level with the floor, regulated by one man. The driving-wheel is removable while in motion for safety in the event of choking.

## Correspondence.

To the Editor of THE BUILDER.

## DISCOVERY AT BEVERLEY MINSTER.

SIR.—In the account of the discovery of the foundations of the Chapter-house, reprinted in your last issue (p. 479) from the *Manchester Courier*, there is a slight inaccuracy which it may be well to correct, as it is, unfortunately, possible that the remains may soon be covered up again.

The base of the central column of the crypt of the Chapter-house is not circular; it consists of a chamfered plinth octagonal on plan, with the angles of the octagon placed on the centre lines of the sides of the octagonal Chapter-house, and upon this plinth is a moulded base of plain character, of sixteen sides on plan, the projecting angles below the moulding being simply bevelled downwards. The central column was, therefore, a sixteen-sided figure on plan, about 2 ft. 8½ in. in diameter. Part of the stone floor of the crypt still remains around this base.

The other fragments discovered are a part of the south-west wall of the octagon (including the internal angle of a buttress), one side of the buttress between the eastern and south-eastern faces (the base-course of which is retained upwards as if to meet the base-course of the north-east transept), and part of the inside face of the south-east side of the octagon. From these fragments it appears that the crypt under the Chapter-house was an octagon of 28 ft. 7 in. internal diameter, and 38 ft. 5 in. external diameter above the base-course. The low level of the base-course, compared with that of the main building, is remarkable, the difference being some 4 ft. 6 in. All the masonry uncovered is set with sand or fine gravel joints, apparently quite without lime. The remains must be contemporary with the lancet choir and transepts, one of the mouldings of the base-course being of exactly the same section as in the base-course of the main building.

It is to be hoped that the Minster authorities may be induced to continue the excavations, and to keep open the very interesting fragments which have already been uncovered.

JOHN BELSON.

Hull, December 20, 1890.

## The Student's Column.

## HOT-WATER SUPPLY FOR BATHS, LAVATORIES, &amp;c.—XXVI.

LOW-PRESSURE BOILERS, ALSO FITTING HIGH-PRESSURE BOILERS FOR TEMPORARY LOW-PRESSURE WORK.

(Concluded).

WHEN a range has two ovens and has a low-pressure boiler, this requires most usually to be fixed at the back of the fire, occupying the same position as a high-pressure boiler would; this boiler must of necessity be boot-shaped, as a tolerably large space must be allowed for ebullition, as the water in these boils so violently; if a good space is not left, then the annoyance of boiling-water being ejected from the steam-pipe is experienced.

Fig. 70 shows the usual method of connecting

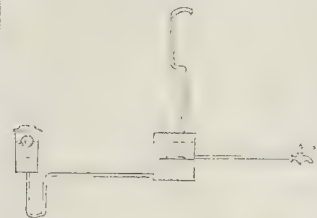


FIG. 70.

up a low-pressure boot-boiler. The cold supply is carried in near the bottom as usual, and the draw-off service is taken from about 4 to 5 in. below the water-line, so as to avoid drawing cold water until the hot is exhausted, as just explained.

The ball-valve should be regulated so that the boiler fills within about 4 in. of the top, so as to leave ample room for any violent motion of the water, and there is no objection to this large space in this instance, as only the lower part of the boiler comes in contact with the fire. The real object of the large space is to permit a free escape of the steam above the water, as should any particles of water be thrown by their motion into the mouth of the escape-pipe, the steam will instantly eject them into the chimney, sometimes a pint of water at once. All pipes that are run behind ranges should be iron,—never lead, as there are numerous enemies to this latter pipe, and should a leakage show itself the range has to be removed before a repair can be effected; this also applies to ranges with side boilers, when it becomes necessary to carry a pipe round the back or beneath the range.

It will be noticed in the drawing that there is a "set" or crank in the steam-escape or expansion-pipe. This answers a very useful purpose in preventing any small quantity of water from being ejected, as when the water (unless in quantity) is propelled up the steam-pipe, this obstruction will prevent its free passage and escape into the chimney under ordinary circumstances. These boilers should be of welded wrought-iron.

Sometimes a low-pressure boiler is used for supplying hot water above its own level by regulating the ball-valve to a height that will allow of the water rising up within the expansion-pipe, as fig. 71. This will answer, certainly, but if the boiler is a rapid heating one, a good deal of annoyance will be experienced by the steam forcing water out of the pipe, even if this pipe is carried to an unusual height; or should the steam experience any difficulty in escaping, it will probably make its way through the cold supply cistern, causing this to overflow. This arrangement cannot be recommended. It is better to have the water drawn from the level of the boiler, or else have a small tank and circulating pipes fitted up.

The ball-valve, which is an essential feature in the self-filling apparatus of a low-pressure boiler, is frequently a source of complaint; for, as every practical man knows, a ball-valve anything near perfection has not yet been made; but perhaps of the different varieties those that

are constructed upon an equilibrium principle give the best results. Ball-cocks are now losing favour, as they act so slowly in filling a boiler. While the level of the water is low the cock admits an abundant supply, but as the

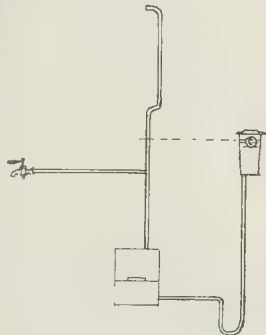


FIG. 71.

level rises the supply decreases gradually, so that when the water is within 1 in. of its accustomed level the water is only dribbling in, and this slowness in filling gives every opportunity for the fire to injure the boiler-plate, besides being objectionable in other ways.

The fitting-up of a high-pressure boiler before the circulating apparatus is erected, so that the boiler has to be used for low-pressure purposes temporarily, sometimes for a few months, is of common occurrence, and can usually be arranged without difficulty or great expense. This can be done in two or three ways, but the least expensive method costs the most to re-convert when the hot-water circulation is ready, and *vice versa*.

The least expensive method is to fit in the high-pressure boiler and construct the flue to it at the back of the range, and then to carry a flow and return service from the boiler just through the chimney jamb (as fig. 72); these two services

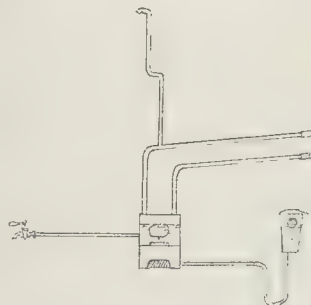


FIG. 72.

being capped off until required for circulation. From the flow-pipe is carried a steam escape pipe as shown, but the boiler is fed and drawn from in the same manner as a low-pressure boiler. The flue under the boiler requires to be stopped while it is used for low-pressure purposes; this is best done by a piece of fire-brick cut to shape, as it is easily removable, leaving the flue clear when needed.

When the conversion is made, the flue is cleared as just explained, the flow and return services are uncapped and connected, the steam escape and the cold supply pipes are both stopped off, and the draw-off tap can be left as an emptying service if the tap has a loose key; it is then ready for use, provided the circulating apparatus is complete.

Another method is to complete the apparatus from boiler to cylinder, but supplying the cylinder temporarily with a supply cistern, as fig. 73. This is without doubt much the best arrangement, if the conversion is to be made afterwards, as when it is done the work is reduced to a minimum—in fact, it is only

just necessary to put the fire out, as all that is needed is to complete the apparatus above the cylinder, the draw-off tap below answering for

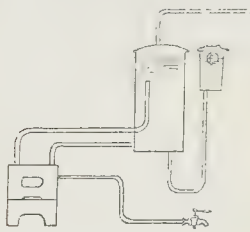


FIG. 73.

the emptying service. By this arrangement very little expense is incurred but what is necessary to the complete apparatus.

In conclusion, let it be the ambition of everyone to do this work really well. There is no branch of mechanics which will permit of careless labour so little as this, and workmen have an opportunity of displaying ability and disinterestedness to a far greater extent than in many other trades.\*

#### GENERAL BUILDING NEWS.

**NEW MUNICIPAL BUILDINGS FOR BLACKPOOL.**—At the meeting of the Blackpool Town Council on the 17th inst. the General Purposes Committee's recommendations with respect to new municipal buildings were confirmed. The proposal is to purchase the plot of land in Victoria-street, adjoining the town's yard, extending to Bank Hey-street. About a dozen large houses and several shops and two licensed houses will have to be pulled down, and it is intended to make a large square, in which will be included a town-hall, with all the Corporation offices together—police office, free library, market, art gallery, &c. The intended size of the town-hall is 72 ft. on the front, and extending 70 ft. backwards, altogether covering an area of 5,040 ft.

**LISWORTHY CHURCH, NEAR COWBRIDGE.**—The report of Messrs. Bruton & Williams, architects, of Cardiff, has been adopted for the restoration of Lisworthy Church, near Cowbridge, Glamorgan-shire.

**RESTORATION OF BRADFORD ABBAS CHURCH.**—The old parish church of Bradford Abbas, Dorset, which dates from the fifteenth century, has just undergone restoration, at a cost of 1,400l. Mr. C. B. Benson, architect, of Yeovil, furnished the plans; and the restoration has been carried out by Mr. R. Andrews, of Thornford.

**NEW CHURCH, BIRKDALE, SOUTHPORT.**—The new Church of St. John, Clifford-road West, Birkdale, Southport, has just been completed. The structure has been erected from the designs of Messrs. Percy & Austin, of Lancaster, to supply the requirements of a portion of St. James's Parish, Birkdale. The architects' plans are not at present being carried out in their entirety, the sitting accommodation being for 300 persons, against a total of 514 sittings provided for in the complete structure. The cost of the work is 2,624l.

**RE-OPENING OF CHALFORD CHURCH.**—Chalford church, near Stroud, was re-opened on the 9th inst. after having been closed for repairs and improvements. The builders were Messrs. Drew, of Chalford, and the architect was Mr. R. Edmund Kersey, F.S.A., London. The galleries have been removed, the church has been re-roofed, re-seated, and re-floored, and a new heating apparatus has been inserted. The whole of the work will cost about 1,200l.

**NEW SCHOOLS, HILWICH.**—New Wesleyan Sunday schools, situated at the rear of the existing chapel at Hilwich, Lincolnshire, have just been completed, at a cost of 3,041l. The new schools are estimated to afford accommodation for 60 scholars. The style is simple Gothic, and the building was erected from designs by Messrs. Woodhouse & Morley, architects, Bolton. The contractors were Dougill, Horwich; carpenters and joiners, Messrs. Moore Brothers, Rawtenstall; slating, Messrs. Warr & Co., Bolton; plumbing, Mr. R. Chericus, Bolton; and plastering and painting, Mr. A. E. Warburton, also of Bolton.

**A NEW VETERINARY ESTABLISHMENT AT THE WEST END.**—Messrs. T. A. Dollar & Sons' new premises at 55, New Bond-street, which have just been completed, occupy a site on the east side of the street, between Brook-street and Maddox-street. Passing through an archway supported by granite pillars and fitted with ornamental iron gates, the visitor reaches a paved yard, half of which is covered.

\* These papers will be published in book form by Messrs. E. & F. N. Spon, Strand, London.

in with a glass and iron roof. Beginning at the right or south side of the premises there is the clerks' office—roomy, well-lighted apartment, supplied with all the modern implements of communication, bells, speaking-tubes and telephone. Next on the ground-floor is the consulting-room, from the window of which a view of the whole place is commanded. This is the heart of the establishment; everything centres round and is subservient to it. Book-cases and shelves round the room offer resting places for a complete reference library, not only of purely professional works, but of the literature of collateral arts and sciences relating to live stock. The various stud-books and calendars of pedigree stock, from the thoroughbred to the Shetland pony, and from the shorthorn to the pig and sheep, will all be here when the wants of clients render necessary a reference to them. Beyond the sanctum sanctorum are large coach-houses and store-rooms, and at the end of this range a row of boxes and stalls, fitted with hot and cold water, and books and rings for slinging or otherwise controlling sick and injured horses. On this level there is also a covered ride, in which horses may be galloped to test their soundness. The ends are circular, and are provided with inspection galleries, from which the surgeon may safely view the horse near either approaching, turning, or receding. On the north side, commencing at the entrance, is first the inclined way leading to the stabling on the first floor. About this nothing need be said except that its gradient is much easier than is usually possessed by such ways, and that it is a novel arrangement of paving material, a secure foothold is always assured. Beyond it is a ten-stall stable admirably fitted, lighted, and ventilated. Farther on is the shoeing-forge—almost unique in its arrangement and fittings; the two fires are back to back, and the bellows, usually so unsightly and cumbersome, by cranks and levers. Each fire has a water-tube, by which the water serves the double purpose of saving the nozzle from injury by heat, and providing a constant supply of hot water for the stables. Coming back to the inclined-way, we find behind it a Turkish bath for horses, fitted with air-shaft, and all the therapeutic or hygienic appliances for this form of Turkish bath-stove will provide the means of heating; hot and cold water are laid on for shampooing, and the walls are of smooth hard cement to allow of frequent washings down. Here also are the harness-room, the pharmacy, the surgery, and some accommodation for stores—all appropriately fitted for a working institution. At the top of the incline is another harness-room and a master-room for the men. Then, on the left, a large isolation box, and on the right two loose-boxes for ordinary patients. Beyond these we enter the ten-stall stable—the finest stable in the establishment. The floor is of Wilkinson's patent metallic paving, very durable, hard and clean surface, giving good, firm foothold to the horses. The walls are of enamelled bricks, with tiles of a cool green tint in front of the stalls. There is a timber roof, stained and varnished, and lighted by a 20-ft. lantern, all the windows of which are opened simultaneously by turning a crank handle (Adam's patent). The same arrangement is used throughout the stables and offices. Beyond, and communicating with this stable, is the operating theatre, a spacious room, lighted by a lantern and two windows, and fitted with wood blocks. Ample space is provided for hay and corn, and at the extreme east end of the building stands the gas-engine room, where all chaff used is cut by power. A commodious dwelling-house for the resident members of the firm occupies most of the first and all the second floors of the south block, but at the east end of the former are three most important rooms, viz., the library, physiological and chemical laboratories. The keynote in construction appears to have been good sanitation. For this reason, the light is everywhere excellent, for good lighting means cleanliness—the walls and even the roofs are entirely of waterproof materials, and can be washed down. Surface drainage is universal within doors, and outside there are numerous manholes in case of a block, while the drainage system is ventilated by pipes running to the loftiest points on the buildings. Lastly, there are five cisterns (each of 400 gallons capacity) to supply water for drinking, washing, and flushing drains; and hot and cold water are everywhere laid on. The stable construction is fireproof throughout, all corners are rounded to avoid injury to horses, and the stable fittings (supplied by Messrs. Musgrave & Co.) are of the best. The entire work has been carried out by Messrs. Jno. Mowlem & Co., and the architect is Mr. Robt. Walker, F.R.I.B.A.

#### SANITARY AND ENGINEERING NEWS.

**ERDINGTON SEWERAGE.**—These works have just been completed, at a total cost of 4,093l. 11s. 7d. The sewage is conveyed by pipe sewers into the Birmingham system, and purified on the Birmingham Sewage Farm. This arrangement necessitated some sewers from 30 ft. to 40 ft. deep, and special precautions had to be taken. The engineer to the works was Mr. W. H. Radford, C.E., of Nottingham, and the contractor was Mr. G. Law, of Kidderminster.

**CHESTER-LE-STREET SEWERAGE.**—The Chester-le-Street Union Rural Sanitary Authority have approved of four schemes of main sewerage and sewage disposal for (1) Birtley, (2) Wotton Gilbert, (3) Sacriston and Daisy Hill, and (4) Elmossley, in the County of Durham, with a total estimated population of 10,000, as per plans, prepared by Mr. D. Balfour, M.Inst. C.E., Newcastle-on-Tyne. The main sewerage scheme embraces about twelve miles of pipe sewers, and the sewage will be purified by the process of intermittent land filtration, the total cost being estimated at 14,000l. The necessary steps for the compulsory purchase of the land are now being taken.

**PENSHAW BRIDGE, SUNDERLAND.**—This bridge over the river Wear, at Panshaw Staiths, near Sunderland, consisting of iron-bow girders 155 ft. in length, supported by Marden limestone ashlar abutments, resting on concrete and pitch-pine piled foundations to a depth of 20 ft. under the bed of the river, is now rapidly approaching completion, and is expected to be opened for traffic about the end of the year. The whole of the works have been designed by, and carried out under the superintendence of, Mr. D. Balfour, M.Inst. C.E., F.G.S., St. Nicholas-buildings, Newcastle-on-Tyne. The contractors for the masonry, piling, and ironwork are Messrs. Head, Wrightson, & Co., Stockton-on-Tees, and for the approach roads Mr. J. Carrick, Durham.

#### STAINED GLASS AND DECORATION.

**NEW WINDOW, ST. SWITHIN, SPROATLEY-IN-HOLDERNESSE.**—The newly-restored Church of St. Swithin, Sproatley-in-Holderness, has very recently received a four-light east window by Clayton & Bell. The subjects represented are "The Agony," "The Crucifixion," "The Taking Down the Body from the Cross," and "The Ascension."

**NEW WINDOWS, ST. SAVIOUR'S, WOOLCOTT PARK, BRISTOL.**—Two stained-glass windows have recently been erected in the Church of St. Saviour, Woolcote Park. One, in the south side, is from the studio of Mr. E. H. Hemming, of London, and the subject is "The Flight into Egypt." The other window is in the south transept, and is from the studio of Messrs. Joseph Bell & Sons, of Bristol, and the subject consists of three figures—Faith, Hope, and Charity, which are treated symbolically.

**NEW MEMORIAL WINDOWS AT THE MANCHESTER CATHEDRAL.**—A memorial window has been presented to the Manchester Cathedral by Lord Egerton of Tatton, "in affectionate remembrance of William Tatton, first baron." The window, which represents "Joseph among his Brethren," has been designed by Messrs. Heaton, Butler, & Bayne, of London, who are also executing the work. A stained-glass window is also being erected near the south part of the Cathedral, the gift of Dr. Stevenson, of Streteford. The principal subject of illustration is "Christ Healing the Sick," extending over the four principal lights. The tracery panels are occupied by figures of the four Evangelists. Messrs. Wailes & Strang, Newcastle-on-Tyne, have designed the window, and the work is being executed by that firm under the direction of Mr. M'Donnell.

#### FOREIGN AND COLONIAL.

**FRANCE.**—The museum at Dijon has acquired a statue representing François Rude, the sculptor, in atelier costume and working at the bas-relief of the Arc de l'Étoile. The work is by M. Ernest Christophe. An antique female head in polished wood, a remarkable work of antiquity, has been stolen from the Vienne Museum, as well as a number of Roman coins. "The thirty-ninth exhibition of the Société des Amis des Arts is to be opened at Bordeaux on the first Monday in March. The Association Artistique et Littéraire de Brittany has organised an exhibition to be opened at Rennes on February 2, and to close in March: the artistic society of "Enfants du Nord" has undertaken a special exhibition of artists of the north of France, to be organised by M. Dutert (architect), MM. Commerre and Meertz (painters) and M. Hector Lemaire (sculptor): an "International" exhibition of paintings was opened in the Galerie Georges Petit on December 20, and in the same gallery, in March, there is to be an exhibition and sale of the works of John Lewis Brown. On the eighteenth of this month an exhibition of pastels, pictures and sculpture was opened in the Galerie Durand Ruel. A club of artists and literary men has been founded at Paris, under the title "Cercle des Cisaillers," the object of which is to organise private exhibitions, and also bring about a fusion between the two opposing schools. The Society of French Pastellists has elected MM. Le Tendre, Rosset-Gagnier, and Rillotte to replace MM. John Lewis Brown, Emile Lévy, and Olivier Merson. The military engineers are again busy about the fortification question. According to the present proposals, the existing fortifications are to be demolished, and a fortified *escarte* to be reconstructed on the line of the ancient urban communes which surround the capital. The town of Puy is about to arrange, in various unused corners of its Museum, a series of small lodgings to be placed gratuitously at the use of painters coming



to study landscape in the neighbourhood.—The Société des Beaux-Arts de Mer et Monaco has commissioned M. Touit, architect, to carry out some important work in decoration of the Casino.—Artists will hear with considerable regret that the Government propose to substitute a full-blown "departmental" road for the charming path now leading to the fountain of the grotto and the chateau of Petrarch.—The Government has given over to the Museum of Decorative Art a number of very curious objects once the property of Napoleon.—A competition is now open for the building of a new theatre at St. Nazaire, the designs to be sent in on the 31st.—M. Schuller, architect, of Nancy, has been commissioned to build the new theatre for the Municipality of Toul.—The Société Centrale des Architectes has elected its Council for the ensuing year as follows: President, M. Charles Garnier; vice-presidents, MM. Joly and A. Hermant; principal secretary, M. Loviot; assistant secretary, M. Roux; editing secretary, M. Boileau; archiviste, M. Heré; treasurer, M. Batailleux; censeurs, MM. Bailly, Daupnet, and A. Normand.—M. Croizet, a former pupil of the Ecole des Beaux-Arts, has been appointed by the Académie des Beaux-Arts to occupy the post of professor at the Free School of Art at St. Quentin.—The death of the eminent painter Eugène Lami is announced, at the age of ninety-two.

BERLIN.—The seventieth birthday of Professor C. Becker, President of the Prussian Royal Academy, was officially celebrated last week.—In reference to the erection of a monument to the deceased Emperor William by the Rhine Province, the design for which was won in competition by Messrs. Jacobs & Wöhling, of Düsseldorf, we now hear that, owing to difference of opinion in the building committee of the Prussian Government, the preliminary design, several fresh proposals (among which one by Herr Bruno Schmitz is to be found) are to be laid before the Emperor for criticism, the committee's letter begging him to act as final assessor having been accepted.—According to Herr Bruno Schmitz, the designs for memorials to William I., about to be erected at the Ports Westphalia and on the Kyffhäuser, have been estimated for, with the result that the expenditure first granted will not be exceeded. In the Kyffhäuser monument case the estimate is nearly 30,000.—The general census held throughout Germany, on December 1, shows that the empire has fewer cities with populations numbering over 250,000. These seven cities are: Berlin, with 1,574,435; Hamburg, 570,490; Leipzig, 353,272; Munich, 334,710; Breslau, 334,710; Cologne, 282,537; and Dresden, 276,055.

NEW CHURCH AT RAMLEH, EGYPT.—On Saturday, November 1, the new church of All Saints, Ramleh, was opened with a special service conducted by the Rev. E. J. Davis, M.A., Chaplain of St. Mark's, Alexandria. The building has progressed very rapidly, for the foundation stone was only laid on September 27 last. It is a substantial structure of four bays, with organ-chamber, vestry, and apsidal chancel, the whole being covered with open-timbered roofs. The walls consist of solid masonry. The *Egyptian Gazette* says that too much praise cannot be given to Messrs. Falanga and Diamanti for the execution of the work entrusted to them, and to their praiseworthy liberality in giving the valuable time of themselves and their staff free, their only charge being the cost price of the materials and the labour employed. Mr. Diamanti has himself personally superintended the building, and his efforts have been much appreciated. The original designs were the work of Mr. Price, of Cairo, but valuable suggestions by Mr. James H. Money, of Newbury, Berkshire, were also availed of.

RUSSIA AND FINLAND.—A permanent exhibition of manufactures is to be established in Moscow, the promoters also undertaking the sale of their goods. An exhibition building is to be erected in the Sadovaja-street.—Although the port of Batoum was considerably enlarged and improved in 1885, further works of a similar character have become necessary through the annual increase of the petroleum exports. Many articles of merchandise also are conveyed from Central Asia to Europe and Batoum by the Transcaspiian Railway.—The Russian Government has, for financial reasons, relinquished the original plan for the Siberian railway; but, by combined railway lines and canals, communication will nevertheless be established with the Pacific Ocean. The route decided upon will connect the Siberian Railway from Tomsk to Irkutsk, 1,654 kilometres; the Transbaikalian Railway, from Lake Baikal to Stritsovet, 1,656 kilometres; and the Ussuri Railway, from the latter place to Vladivostok, 405 kilometres.—The new premises of the Finnish Society of Literature have now been completed at Helsingfors, the cost being 8,000.—The leading Finnish timber merchants have, like their Swedish confrères, decided upon decreasing their manufacture in 1891.

SWEDEN.—The cost of the great Exhibition of Industry and Arts proposed to be held in Stockholm is estimated at 110,000. It is expected that the State, as well as the city, will contribute thereto. The time of its taking place has not yet

been fixed.—Simultaneously with the Industrial Exhibition to be held in Gothenburg next year meetings of manufacturers, engineers, &c., are to take place.—A company with a capital of 10,000 k. has been formed for the working of a valuable cement deposits recently discovered in Sweden.—The Västerna Church, one of the most historical and ancient in Sweden, is at length to be restored to 10,000 k. has been presented by Sundsvall gentlemen towards new school-houses in that city.—The well-known Norwegian architect, Herr Nissen, has paid a visit to Sweden in order to study the arrangements of Swedish Masonic buildings with a view to the erection of a great new central lodge in Christiania. The new Masonic palace at Helsingborg, to which we recently referred, is to have special attention, this being said to be the finest of its kind in Scandinavia.—The Swedish Government proposes to put a tax upon the felling of trees in forests. We have referred to the association formed among Scandinavian woodpulp makers for the restriction of the output next year, and it seems that this step is already being felt, foreign consumers being eager to conclude contracts before prices rise. The production is to be reduced by thirty-six hours a week.—Negotiations are now also going on among the sawmill owners for reducing the output of the new year from 25 to 30 per cent. All the leading firms have already given their adhesion to the step.

#### MISCELLANEOUS.

THE NORTHERNMOST TELEPHONES IN THE WORLD.—A telephone has just been completed between Reykjavik and Havnafjord, in Iceland, being the first telephonic line in that island, and the second telephone within the Polar Circle. The first laid within the Circle, and the northernmost in the world, was that of Hammerfest, in Norway, lat. 70 deg. 40 min. N., close to the North Cape, completed some months ago. Arrangements are now being made for extending next summer the telephone to the North Cape, where a small office is to be established in summer, for the benefit of tourists.

SIBERIAN RAILWAYS.—On account of the difficulties and great expense of continuing the Siberian line, so as to be able to have through trains between Moscow and Vladivostok on the East Asiatic coast, an extension which would require some 3,500 km. of rails, a new scheme of connecting the above two points is now under consideration. This new scheme combines a railway and waterway route; Tomsk to Lake Baikal (1,670 km.), Lake Baikal to Ussuri River (1,070 km.), and Ussuri River to Vladivostok, altogether some 3,100 km. of rail, estimated to cost about 6,300,000.—*Deutsche Bauzeitung*.

REGISTRATION OF PLUMBERS.—At the Plymouth Municipal Buildings, on the 13th inst., the Mayor of Plymouth (Mr. J. T. Bond) distributed a number of certificates granted by the Worshipful Company of Plumbers to master and operative plumbers in the district. The Mayor said it afforded him much pleasure to preside at that meeting of the Plymouth Centre of the National Registration of Plumbers, the object being to instil into the minds of men engaged in the plumbing trade a desire to become real masters of their craft, and in proportion as they became qualified they would afford satisfaction to householders who employed them. Mr. W. N. Elliott moved.—"That it is essential to the health and well-being of all classes of the community that efficient measures should forthwith be taken for securing the systematic training and instruction of plumbers' apprentices, and education in the branches of science and technology required by persons engaged in works affecting the sanitary condition of dwelling-houses and other buildings in respect of their water supply and drainage, and that the object can only be satisfactorily attained by the combined action of plumbers and educational authorities throughout the United Kingdom in accordance with the proposal of the Worshipful Company of Plumbers, which is worthy of general approval and support. He had always considered that there should be a definite standard to the apprenticeship of every lad that he should attend technical instruction so many hours a day. If boys were instructed regularly in the scientific portion of their business it would give them more serious thought as to what was expected of them. The Worshipful Company of Plumbers was doing a very excellent work, and he looked for the time when it would be no longer possible for the "handy man" to take upon himself responsibilities which ought to belong to men who had a thorough practical and theoretical knowledge of the trade they professed. He was pleased to hear Mr. Cole's assurance that the Company would endeavour to keep control over those certificated, as a man ought to be compelled to do his work as well as know how to do it. The motion was agreed to.

THE PROPERTIES AND EFFECTS OF FOG.—The fog, it is said, is about to undergo at the hands of certain scientific observers the ordeal of scientific investigation. The inquiry will not be the first of its

kind. Though, perhaps, never before the subject of a collective examination, the characters of this clear pall which from time to time wraps our streets in dangerous uncertainty, observation, and suggestion. To assign to it any constant composition is indeed impossible, since, besides its fundamental basis of water vapour, it must carry in a condensed form the mixed impurities of city air. In considering these gloomy winter clouds one primary idea, which commonly presents itself is that of smoke. Our tingling eyes and our offended sense of smell alike protest against this contact of carbonaceous matter out of place. Analysis confirms the sensible fact. Other matters, however, claim their place as components. The various refuse gases of manufactures, the emanations from innumerable human homes, and the additions furnished by sewage add each its contribution to the dense and semi-liquid atmosphere. Happily no process of accumulation can, under ordinary circumstances, abolish the inherent purity of the now overburdened air. There is, too, the saving influence of the suspended carbon. With all such qualifying conditions, however, the fog atmosphere continues a direct cause of much discomfort and ill-health. Acting, though it must largely by its irritant properties, it bears about also at all times more distinctly morbid ingredients. Whatever its precise nature, however, there is no question as to the injury to health, fatal too often, which the fog assuredly brings.—*Lancet*.

THE EDINBURGH RAILWAY SCHEMES.—At a meeting of the East of Scotland Engineering Association, at 5, St. Andrew-square, Edinburgh, on the 16th inst., a discussion took place with reference to the railway schemes. Mr. James Thomson, sanitary engineer, occupied the chair. The principal speaker was Mr. Kerr, of Messrs. Kerr & Symon, the originators of the George-street scheme. Dealing first with the North British proposals, he said he believed there was no way of getting over the difficulty at the Waverley Station, without either granting a double line westward to Corstorphine, or doubling the line at Haymarket and increasing the accommodation at the Waverley Station. As to Prince's-street-gardens, he thought the Mound should be pierced on the south side instead of the north, in order to preserve the northern side of the Gardens and to overcome public opposition. Dealing secondly with the Caledonian proposals, he called attention to the risk of danger which a tunnel would cause to the Royal Institution and the Scott Monument. The Royal Institution was founded entirely upon piles, and there was no doubt that a tunnel above the base of the piles would tend to act as a drain for water, and so, by altering the substratum, create insecurity. The Scott Monument was founded partially upon piles, and, owing to the construction of the Monument, the damage which might result from displacement would be difficult to repair. The greater part of the Monument above Sir Walter's head was founded upon the vault, and there was great risk if that vault was disturbed in its foundations, of incalculable damage being done. Apart from the depressing effect of the low girders of the station, the station itself would practically be a station in a tunnel, and be nothing less than a blow-hole for the long tunnel from the west end to the Waverley and from the Waverley to the Caledon Hill. Speaking lastly of the George-street scheme, he explained that this scheme had been prompted, not from opposition to the Caledonian Company, but from a desire to meet the wishes of the community.—Amongst other speakers, Mr. R. C. Brebner said he had no hesitation in stating they would find contractors quite prepared to construct a tunnel below Prince's-street, and to undertake all risks. It was also stated that, as far as was known, the Caledonian Company intended to propose to ventilate their tunnel by fans; and, further, that in the meantime only one building had been acquired for the purposes of constructing ventilating apparatus. In reply to the Chairman, Mr. Kerr said he did not know what the Edinburgh and Leith Junction Railway engineers proposed to do to secure the ventilation of the George-street tunnel, but he thought they might adopt something like fans. He pointed out that at the same time the greater air space offered by the St. James-square station of the George-street scheme and its surroundings as compared with the air space of the Waverley Market and its surroundings. As had been previously arranged, the meeting came to no resolution on the schemes.

PUBLIC IMPROVEMENTS AT HORBURY.—An inquiry was held at Horbury on the 17th inst. by Colonel J. Orde Haxey, R.E., an inspector from the Local Government Board, touching the application of the Horbury Local Board for sanction to borrow the sum of £2,000, for street improvements in the township. Mr. T. Barker, Clerk and Solicitor to the Local Board, stated that the principal improvement sought to be carried out was the widening of Westfield-road, between Horbury and the borough of Ossett. There was no opposition. The Inspector viewed the sites of the intended improvements.



## CONTRACTS AND PUBLIC APPOINTMENTS.

## CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
New Bridge over River Stour	Essex County Council	T. Whitmore	Dec. 29
House, West End Park, Harrogate	.....	.....	.....
Laying Water-pipes at Workhouse	Rene (Staffs) Union	Official	Dec. 31
The 17th	.....	.....	.....
Supply of Timber	.....	.....	.....
Supplying Cast-iron Pipes	E. Sney Water Co.	Martin W. B. Flocks	do
Carting and Laying Pipes	.....	.....	do
Work at Town Hall	.....	.....	do
Rebuilding at Cemetery	Llanfairn Local B.L.	B. Lawrence	Jan. 2
Building Chapel, Caretaker's House	.....	.....	do
Boundary Walls &c.	.....	.....	do
New Schools, Barlaston, Newton-le-Willows	.....	.....	do
Extension of School, Hunstret Carr	.....	.....	do
Mill, Engine and Boiler-house, Chalmers, &c. Elford	.....	.....	do
Station Office, &c. New Passenger Station, Edinburgh	.....	.....	do
Supply of Timber, Iron, &c.	.....	.....	do
Cast-iron Pipes, and special Castings	.....	.....	do
Cast-iron Pipes, Cutting Pipe Trench	.....	.....	do
3 mile Valves, &c. Cockfield	.....	.....	do
Masonry for Service Reservoir	.....	.....	do
Removal of Brecon, Ashes, Dist. &c.	.....	.....	do
Carting away Road Slag and Sweepings	.....	.....	do
Watering Streets	.....	.....	do
Caretaker's, Coal, &c.	.....	.....	do
Extensive Tool Works, Chimney, Office, &c.	.....	.....	do

## CONTRACTS.—Continued.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
House, &c. at Dunes, Valley	.....	S. Cym Jones	Jan. 10
New Sewer, &c. at Dunes, Valley	.....	.....	do
Ventilators, &c.	Workington U.R.A.	W. L. Eaglesfield	do
Enlargement of Schools, Middlefield, near	.....	.....	do
New Road, Penryn	.....	.....	do
Forty-five steel Cokes Sheds at G.W. Works	.....	.....	do
Station Buildings, Reading, &c. Cork	.....	.....	do
New Police Station, &c. at Leek	.....	.....	do
Sinking Shaft, Launey Colliery, near	.....	.....	do
New Fort, West Stanley, near New	.....	.....	do
Cast-iron Type	.....	.....	do
Schools, Victoria Road	.....	.....	do
Villa Residence, Laureston	.....	.....	do
New Police Station, &c. at Leek	.....	.....	do

## PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applicants to be in.
.....	Fulham Vestry (2nd)	25. 2s. per week	Dec. 27
.....	Wootton High. Dist.	180.	Jan. 12
.....	Barton-on-Trent Coun.	150.	Jan. 14
.....	Reading Council	40.	Jan. 17

Those marked with an Asterisk (\*) are advertised in this Number. Contracts, p. 14, and vi. Public Appointments, p. xvi.

ROYAL VICTORIA HALL, WATERLOO-BRIDGE-ROAD, S.E.—The following scientific lectures will be given at this Hall during January: January 6, "The Moon," by Dr. Fleming; January 13, "Glaciers," by Prof. A. H. Green; January 20, "Our Bodies," by Dr. P. H. Carpenter; January 27, "All about Spectacles," by Dr. Colles. A special variety entertainment will be held at the Hall during the Christmas holidays and for the following week. The first performance will be at two o'clock on Boxing Day.

BOOK SALE.—Two good collections of books relating to the fine arts, and including some standard works upon architecture, engraving, sculpture, and ornamental design, were sold at Messrs. Puttick & Simpson's auction-rooms, on Tuesday, 18th inst. Amongst the volumes sold were the following:—Octavo: W. G. Rawlinson's "Description and Catalogue of Turner's 'Liber Studiorum'" (1878), Chaffers's "Hall Marks" (1872), and E. Hamilton's "Catalogue Raisonné of Reynolds's Engraved Works," 11. 4s. (Parsons); Robert Dumas's "Peintre-Graveur Français," with G. Duplessis's "Supplement" to the eleven volumes in seven (Paris, 1835-71), 5l. 10s. (Quaritch); Gustav Parthey's "Hollar" (Berlin, 1858), 1l. (Galway); Quarto: Maberley's "Print Collector," 1844, 14s. (Galway); Henry Shaw's "Specimens of Ancient Furniture," text by Myerick (W. Pickers, 1866), 19s. (Quaritch); J. D. Passavant's "Peintre-Graveur," six volumes in three (Leipzig, Weigel, 1860-4), 2l. 2s. (Galway); Vertue's "Works of Hollar," 1759, and others, 12s. (Russett). Folio: N. X. Willemin's "Monumens Français," A. Pottier's text, with 300 plates, 2 vols. (Paris, 1839), 3l. 16s. (Bayers); John Ruskin's "Modern Painters," 5 vols. original edition (except as to vols. 1 and 2), imp. 8vo., 1851-60, 22l. 10s. (Sotheran); "La Décoration Arabe," containing each 100 chromes from Prisse d'Avennes's work, 4to (Paris, 1855), 6l. 10s. (Batsford); Owen Jones's "Grammar of Ornament," imp. fol. (Day & Son, 1856), 7l. (Money); Douglas Morrison's "Haddon Hall," imp. fol., 1842, 7l. (Parsons); Douglas's "Monasticon Anglicanum," abridged, with the two additional volumes by Captain John Stevens, several plates after Hollar, &c., fol., 1718-22, 3l. 5s. (Eian); J. S. Proust's "Castles and Abbeys of Monmouthshire," imp. fol., 1838, 1l. 5s. (Defries); Bouillon's "Musée des Antiques," 275 plates of ancient statuary, no text, 3 vols., imp. fol., 2l. 14s. (Levy); John Nichols's "Hogarth," original subscriber's copy (Baldwin & Co., 1820-2), atlas fol., 6l. 10s. (Jones); Sir R. C. Hoare's "Ancient History of South Wilt," atlas fol., 1812, 2l. 10s. (Brough); Jules Labarte's "Histoire des Arts Industriels au Moyen Age et à l'époque de la Renaissance," second edition, 3 vols., 4to. (Paris, Morel, 1872-5), 5l. 5s. (Galway); Paul Lacroix's works, 10 vols., imp. 8vo. (Paris, Firmin-Didot, 1847-84), 8l. (Parsons); D. Roberts's "Holy Land, &c.," Croly's text, lithographs by L. Haghe, 6 vols., atlas fol., 6l. 17s. 6d. (Bull); Alphonse Legros's "Les Eaux Fortes," twelve fine etchings, unbound—of this work only twenty complete sets were issued at 60 guineas the set—(London: R. Guernsey, 1878), 5l. 10s. (Deprez); R. F. Gould's "History of Freemasonry," 6 vols., 4to., 1883-7, 1l. 9s. (Jones); Vol. I. of Goldsmith's "Vicar of Wakefield," first edition, of 12mo. (Salisbury, B. Collins, 1766), being the two volumes in one, very scarce (London, 1766, no printer's name), 11l. 5s. (Harvey); E. Seymour's account of G. E. Street's restoration of Christ Church Cathedral, Dublin, with numerous portraits, views, &c., fol. 1882, 10s. (Parsons); a

copy, original edition, of R. B. Brough's "Life of Sir John Falstaff," illustrated by Cruikshank, imp. 8vo., with faults, 1l. 2s. 6d. (George); twenty-six volumes of Ackermann's "Repository," royal 8vo., 7l. 17s. 6d. (Robson); Le Pautre's "Œuvres d'Architecture," sixty fine plates (Paris), 1l. 1s. (Curadozzi); and Hall's "Baronial Halls and Picturesque Edifices of England," with coloured views after Harding, Prout, Cattermole, &c., 2 vols., 1853, 1l. 5s. (Parsons).

THE CITY AND SOUTH LONDON RAILWAY. The new line of communication between the City and the southern suburbs of London, which was formally inaugurated a short time ago by the Prince of Wales, was opened for traffic last week. The line is somewhat of a novelty in railway enterprise. When Parliamentary sanction for the project was first obtained in 1884 the scheme was comparatively a modest one. It was not even dignified by the title of "railway," but was merely to be a subway—a kind of underground tram line, with cars worked upon the cable principle. The journey was to be a short one, the whole distance contemplated being from King William street to the Elephant and Castle, probably less than a mile and a-half. In 1887 further schemes were submitted to the Legislature for an extension to Stockwell, and last year permission was obtained to make a still further extension to Clapham-common. When the extension to Stockwell was sanctioned the company determined to complete the line to that point before opening any section of it. The City end of the line, however, has long been finished. After much anxious deliberation it was decided to adopt the electric current as a means of propulsion, and special locomotives have been constructed to drive the trains by that means. Electricity will also be employed to light the carriages and stations, but for the latter gas will also be available. The City end of the line is a double line track, as it is in future to be called, running in two distinct tunnels, from King William street to Stockwell. At the City end the tunnels pass underneath the narrow thoroughfare known as Swan-lane, and in order to avoid interfering with the foundations of the houses, it was found necessary to carry one of the tunnels for a short distance over the other. Along the remainder of the course the tunnels run side by side, being connected at intervals between the stations, of which there are six,—by short passages. The work of driving the tunnels was commenced by sinking a shaft 15 ft. in diameter near the Old Swan Pier, and was carried on from that point north and south, the soil being brought up and shot into barges on the river. A special shield, devised by the engineer, Mr. Hutton Greathhead, was used, and as the soil was cut through and cleared away the space was lined with segments of cast-iron firmly bolted together, thus forming a circular iron tube 10 ft. in diameter. As the shield was pushed forward the small space between the iron casing and the soil was filled with grouting. The levels, and, of course, the distance from the street to the station platforms varies accordingly. For the most part, the boring was through London clay, which presented little or no difficulty, but between Kennington and Stockwell, a dip or basin of loose rough gravel, heavily saturated with water, was encountered, which had to be cut through under atmospheric pressure, and at a slow rate of progress. Altogether, the tunnelling has occupied about four years, at a cost of nearly 200,000 per mile. The six stations are situated at King William street, Borough (opposite St. George's Church), Elephant and Castle, New-street, Kennington; Kennington Oval, and Clapham-Common.

Stockwell. With the exception of the City Terminus, they have all been specially designed, the principal external feature of each being a dome surmounting the lifts, which are constructed to carry 50 persons each, and are worked by hydraulic engines situated near the Stockwell terminus. There are also wide staircases for those who prefer that means of ascent or descent, and commodious waiting-rooms above and below. Turnstiles at the entrance take the place of the ordinary ticket offices, where each passenger will pay the uniform rate of two-pence for any distance, although an office will be provided where change may be obtained. In the Clapham-road, not far from the Stockwell Station, the company have established a large depot, where the rolling-stock is housed, and here, too, are located the engines for generating electricity for working the lifts. The carriages are slight in build and of simple character, somewhat resembling a light tramcar, only that, windows being useless, the upholstery is carried high up at the back of the seats nearly to the roof. About 100 persons can be carried by three carriages, and the connecting platforms, enclosed by iron lattice-work on either side, give travellers the opportunity of passing along the entire length of the train. The whole journey from the City to Stockwell occupies about twenty minutes. Mr. F. Schute was the assistant engineer, Mr. Basil Mott the resident engineer, and the general contractors were Messrs. W. Scott & Co., of Newcastle-on-Tyne. The Brunswick Rock Asphaltic Pavement Company were the contractors for the asphalt work required in covering the shafts at the whole of the stations on the line.

## LEGAL.

## VENTILATION OF SEWERS IN KENSINGTON. KENSINGTON VESTRY v. SIMPSON &amp; SON.

A TEST CASE of some interest to property-owners and their professional advisers was reported in the *West London Observer* of the 13th inst.

At a recent sitting of the Kensington Justices of the Peace, in Petty Sessions, the Kensington Vestry summoned Messrs. Robert Simpson & Son, of Hollywood-road, for penalties, it being alleged that in erecting a building they had not complied with the regulations of the Vestry in providing a ventilating pipe up the front of the wall of the building to connect with the main between an intercepting trap and the sewer. Mr. Austin appeared for the Vestry, and Mr. Bodkin for the defendants.

Mr. Austin stated that in June, 1890, the defendants sent in a plan subject to the usual order, and that the drain and soil-pipes should be fitted to the satisfaction of the Vestry. On June 26, Mr. Weaver, Surveyor of the Vestry, wrote a letter, in which the clause occurred—"It is also requested that a ventilation-pipe, not less than 20 in. in sectional area, be carried up the front of the building and between the intercepting trap and the sewer." The matter had been before the Bench as far back as October 28, and the questions to be decided were, to his mind, two in number, whether or not the Vestry by their Surveyor had any power to order this work, and assuming it had the power, whether it was a reasonable request to make. The first was a question of law, and the second a question for the Bench. The summons for penalties was taken under Section 83 of the Metropolitan Local Management Act, 1855, and for the breach by their Surveyor, the duty that had arisen with regard to modern sanitary arrangements was this, that the escape of sewer gas from the street gullies was increasing. As Mr. Weaver would explain, an evil had arisen from the perfect sanitary arrangements in





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**BISLEY.** For the erection of a recreation hall, Shaftesbury School, Bisley, for the Col. of the National Rifle Association, Mr. E. J. Atkinson, B.A., architect, 41, St. John's-street, London, E.C. 4. Mr. E. J. Atkinson, B.A., architect, 41, St. John's-street, London, E.C. 4.

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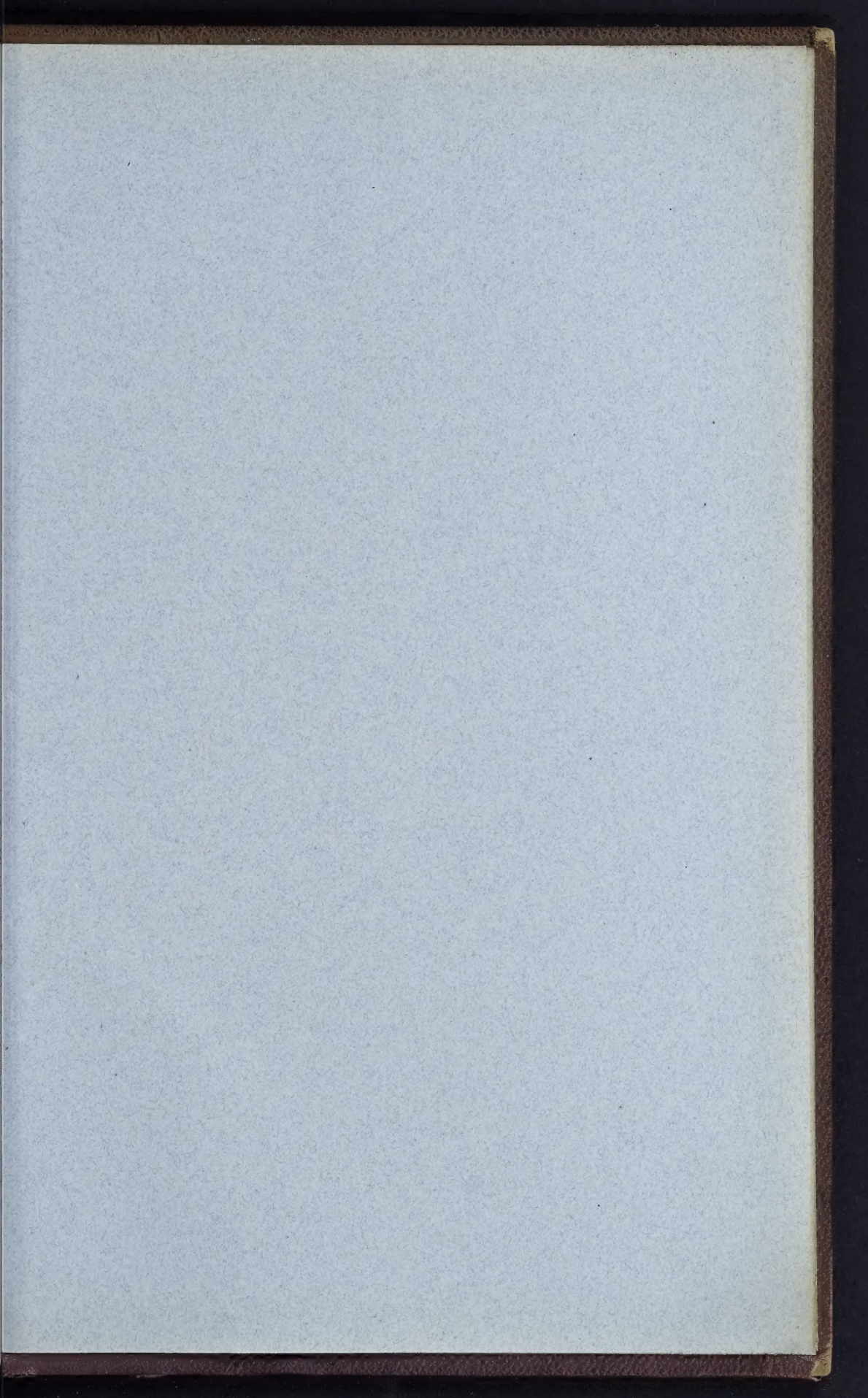
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